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DEVELOPMENT OF A TEACHER EMPOWERMENT MODEL FOR IMPROVING TEACHING PRACTICES OF LOWER SECONDARY SCIENCE TEACHERS*

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Abstract

This paper intended to study the knowledge level of lower secondary science teachers, to study the empowerment level of lower secondary science teachers, to investigate the variation of science teaching practices in terms of teacher empowerment levels, and to develop the teacher empowerment model for improving teaching practices of lower secondary science teachers in Yangon Region. Quantitative and qualitative research methods were used. A set of questionnaire to collect the required data was developed based on **School Participant Empowerment Scale (SPES)** of Short and Rinehart (1992). The reliability coefficient (Cronbach α) was 0.98 for the teacher empowerment questionnaire and 0.87 for science teaching practice questionnaire which was developed based on literature. Three hundred and twenty lower secondary science teachers were selected by using the cluster sampling method. The descriptive statistics was used to analyze the collected data. The level of knowledge (satisfactory level, Mean=10.42, SD=2.17), empowerment (somewhat empowerment level, Mean=2.96, SD=.42) and teaching practice (moderately high level, Mean=3.87, SD=.54) that perceived by teachers and the relationship between empowerment and teaching practice were identified in this study. There was a typical association between science teachers' empowerment and science teachers' teaching practice (r=0.430, p<.01). Professional development and autonomy could be identified as the best predictors of science teaching practice in lower secondary level (R^2=.22, F(5,314)=17.65). Qualitative findings also suggested that the higher the teacher empowerment level of science teachers, the better the teaching practice of science teachers. Finally, the teacher empowerment model for improving teaching practices of lower secondary science teachers could be developed.

Keywords: Teacher Empowerment, Teaching Practice, Science Process Skills

Introduction

The term "empowerment" became a dominant theme in many organizations during the 1980's. Gradually, the idea of empowering teachers

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entered education field in the 1990's. Therefore, the slogan of World Teachers' Day, 2015 was "*Empowering Teachers; Building Sustainable Societies*". In this case, empowering teachers includes involving them in various decision making processes, valuing them through proper respect and salary and enriching their knowledge through training and professional growth. Moreover, Frymier (cited in Behera, 2011) rightly stated that "In any attempt to improve education, teachers are central". In addition, Ekanayake (n.d.) explained that the core of an excellent education system is based on talented teachers. When teachers play the change agent in the school, teacher's empowerment is the need of the hour. According to Copp and Pfeiffer (2003), empowerment is achieved when employees are provided with freedom at work, self-control and esteem in their work, adequate training, rewards and effective management that involves them in decision-making. Reeves(2004) also stated that teachers need to be empowered to reflect on instructional practices and make instructional decisions in the classrooms aimed at increasing student achievement. Short (1994) mentioned that an incorporation of empowerment gives teachers a sense of ownership and opportunities to improve the quality of instruction. Glickman (1991) also summed up the idea that successful schools empower teachers to be at forefront of school improvement initiatives. Therefore, development the teacher empowerment model for improving teaching practices needs to be considered as a vital role in order to improve the quality of instruction.

Significance of the Research

Dr. Khin Zaw (2001) pointed out that no educational system can ever be better than its teachers. For the development of the education system and the quality of education, it solely depends on the quality of teachers. To become quality teachers, teachers' empowerment is one of the most important factors in education field. Leo (n.d.) asserted that empowerment is helping teachers to use their personal, professional or situational powers that they possess and to be quality teachers. Thus, the area of teacher empowerment is major area of concern for the immediate future and crucial element to be successful education.

Moreover, today's science teachers play vital roles in educating, inspiring, and guiding students to become responsible scientifically literate citizens (Lanier, 2009). Otherwise, Secondary Education Modernization Program, Republic of Trinidad and Tobago (2008) described that at the lower secondary level, students' experiences in science will lead them to have a conceptual understanding of the natural world, of man's place in it, and of his responsibility to maintain and preserve it. Thus, teaching science at the lower secondary level is incredibly important because this level connects the knowledge from primary level to secondary level. If the teachers can instill love to learn science at lower secondary level, children will go on to learn further studies of science with enthusiasm.

According to Mishra and Mishra (2011), it can be regarded that teachers are the prime source of knowledge who gives the strength to the students with their capabilities and competencies. If such teachers are given empowerment, then no doubt they will certainly do more efforts toward their students to make them resourceful persons and also they will show their brighter performance side of and extra role behavior are also seen in their academic attitudes. In addition, science education developers recognized that teachers' instructional practices must change in order to reach the goal of science literacy for all. Thus, the researcher intends to develop teacher empowerment model for improving teaching practices of lower secondary science teachers in Yangon Region.

Theoretical Framework

In this study, teacher empowerment was investigated with five dimensions based on teacher empowerment dimensions developed by Paula M. Short and James S. Rinehart, 1992. These five dimensions of teacher empowerment are (1) decision making, (2) professional development, (3) status, (4) self efficacy, and (5) autonomy.

These dimensions of empowerment are described in detail as follows.

***Decision making*:** To be empowered in decision making concerned with science teaching, science teachers' involvement is authentic and their opinion has an impact on the outcome of the decision. Principals need to help the teachers to develop their knowledge and skills needed to make effective decisions, and then give them the authority to make decisions. Moreover, principals can also develop shared decision making in their organization for science teacher empowerment to occur.

***Professional development*:** The professional science teachers should be knowledge-able about their subject to be more empowered. There are some suggestions for leaders who want to implement professional growth opportunities as follows:

1. relating the activities to the school's vision,
2. providing a variety of opportunities,
3. respecting science teacher judgments regarding implementation,
4. being knowledgeable of trends,
5. striving for embedded activities within the school day, and
6. avoiding staleness in opportunities.

Science teachers need to involve in ***formal process*** such as a conference, seminar, or workshop conducted for the science teachers; collaborative learning among members of a science work team; or a science course at a college or university and ***informal contexts*** such as discussions among work colleagues, independent reading and research, observations of a colleague's work, or other learning from a peer for their professional development.

Science teachers can be provided various activities to promote their development in a certain area in accordance with three categories of science teacher professional development (TPD) such as Standardized TPD (centralized approach), Site-based TPD (takes place in school, resource centers or teacher colleges) and Self-directed TPD (initiating and designing their own development).

Status: Principals should frequently praise to recognize the contributions of science teachers, the difficulties and challenges associated with the work of science teachers, and recognize special successes. To increase employee motivation and morale, principals should make time for their employees. In order to be effective, praise must be genuine, personal, and address a specific accomplishment.

Self-efficacy: Science teachers need to know their competences to make a difference and have to develop these competences. Science teachers must have strong skills and abilities to be more empowered. Science teachers can learn to be effective by watching the behaviors of others being effective. Social persuasion by colleagues and superiors that a science teacher can teach successfully will enhance the science teacher's self-efficacy. To impact on self-efficacy including feelings of confidence and the tendency to try new and innovative science teaching techniques, professional development opportunities must be provided and supported to science teachers.

Autonomy: Science teachers should be provided with a vacuum of space to carry out their duties and freedom to decide on their action. Science teachers need professional autonomy in order to carry out their duties diligently without any short comings.

There are three characteristics of autonomy as science teachers being in control of

1. instructional areas within the classroom,
2. non-instructional areas such as classroom discipline, and
3. the determination of needs for supplies and materials.

Moreover, Science teachers should know and practice the following factors in their teaching to be effective.

Regarding Lesson Preparation, the first instructional decision the science teachers must make is determination of the learning objective. Science teachers should use a variety of teaching strategies, activities and teaching aids to enhance students' learning. Activities such as projects, field trips, and science fairs have a definite place in science instruction. The inquiry approach to science course instruction requires a skilled science teacher who can arrange the learning environment so that students can find out. Process skills are grouped into two types- basic and integrated. Basic processes skills are discovery processes and integrated processes skills are inquiry processes. The teachers should play a major role in developing and maintaining a well-disciplined laboratory environment.

Science teachers can use positive reinforcers and negative reinforcers to foster desired behaviors in science teaching. Science teachers must teach many things besides book studies. To carry out evaluation objectives, there are three major types of evaluation approaches with which the teacher should become familiar: diagnostic, formative, and summative. The significance of giving feedback is to help students understand the reasons for the results received and show them ways to do better next time.

Aims of the Research

Main Aim

The main aim of this study is to develop a teacher empowerment model for improving teaching practice of lower secondary science teachers.

Specific Aims

The specific aims of this study are:

(1) To study the knowledge level of lower secondary science teachers

(2) To study the empowerment level of lower secondary science teachers

(3) To investigate the variation of science teaching practice in terms of teacher empowerment levels

(4) To develop the teacher empowerment model for improving teaching practice of lower secondary science teachers in Yangon Region

Research Questions

This research deals with the following questions regarding teacher empowerment to improve teaching practice of lower secondary science teachers.

(1) What are the knowledge levels of lower secondary science teachers in Yangon Region?

(2) What are the empowerment levels of lower secondary science teachers in Yangon Region?

(3) Is there any variation in science teaching practice in terms of teacher empowerment levels of lower secondary science teachers in Yangon Region?

(4) What is the teacher empowerment model for improving teaching practice of lower secondary science teachers in Yangon Region?

Definition of Key Terms

Important terms are carefully defined in explaining the concepts underlying the development of the investigation.

(1) ***Teacher empowerment*** refers to the opportunity and confidence to act upon one's ideas, to influence the way one performs in one's profession.(Melenyzer, 1990)

(2) ***Teaching practice*** refers to something that teachers do often, especially a particular way of teaching something.

(3) ***Science process skills*** refers to the skills that ensure active student participating, have students develop the sense of undertaking responsibility in their own learning, increase the permanence of learning, and also have students acquire research ways and methods, that is, they ensure thinking and behaving like a scientist (Ostlund, 1992).

Limitations of the Study

Participants of the study are lower secondary science teachers from Basic Education schools of Yangon Region.

Operational Definition

In this study, teacher empowerment refers to the ability, opportunity and desire to act upon one's ideas, to influence the way one performs in one's profession. Perceived teacher empowerment was examined by the mean responses of teachers from Basic Education Schools on four-point Likert-scale questionnaire consisting of forty-eight items about the perceptions of participants in their profession. The higher the mean values of responses, the greater the level of perceived teacher empowerment.

Review of Related Literature

A review of related literature deals with two main parts: (1) Teacher Empowerment and (2) Science Education.

Teacher Empowerment

Conger and Kanungo (1988) viewed empowerment as a motivational construct. Empowerment is an enabling rather than a delegating process. Enabling, from this perspective, involves creating conditions for enhancing motivation for task accomplishment through the development of a strong sense of personal efficacy.

Empowerment is most often viewed as a process through which people become powerful enough to engage in, share control of, and influence events and institutions affecting their lives. In part, empowerment requires that people gain the knowledge, skills, and power necessary to influence their lives and the lives of those they care about, as in the professional life cycle of teachers (Hobbs, *et al*, 2010).

Bolin (1989) stated that teacher empowerment is defined as investing teachers with the right to participate in the determination of school goals and policies and to exercise professional judgment about what and how to teach.

Melenyzer (1990) defines that teacher empowerment is the opportunity and confidence to act upon one's ideas and to influence the way one performs in one's profession.

Kirby (1992)defined true empowerment as the involvement in decision making, authority over classroom and school level issues, and opportunity to acquire the knowledge necessary for these types of authority. Kirby (1992) also explained there are three key elements of empowerment: (a) the ability to act,(b) the opportunity to act, and (c) the desire to act.

Short and Rinehart (1992) identified six dimensions of teacher empowerment as follows.

1. *decision-making* - teachers' participation in critical decisions that directly affect their work, involving issues related to budgets, teacher selection, scheduling, and curriculum
2. *professional growth*- the teachers' perception that the school provides them opportunities to grow and develop professionally, to continue to learn, and to expand their skills during their work in school

3. *autonomy* - teachers' feeling that they have control over various aspects of their working life, including scheduling, curriculum development, selection of textbooks and planning instruction
4. *status* - the professional respect and admiration the teachers perceive that they earn from colleagues
5. *self efficacy* - teachers' perception that they are equipped with the skills and ability to help students learn, and are competent to develop curricula for students and
6. *impact* - teachers' perception that they can affect and influence school life

Hobbs (2004) also studied how fifteen career science teachers' perceptions of their empowerment, as defined by the above six elements presented by Short (1992) have changed as a result of key events during their careers. Two models emerged. One identifies the two simultaneous processes of empowerment: The personal empowerment process includes self-efficacy and status. The organizational empowerment process includes autonomy, decision-making and impact. Both processes occur simultaneously although individual teacher stories may emphasize one over the other.

Figure 1: Personal and organizational empowerment model
Source: Adapted from Hobbs, M., *et al*., (2010).

The second model shows empowerment as a cycle with three stages of empowerment: The Initiating Phase, The Increasing Phase, and the Sustaining Phase. Although all the dimensions are present during all stages, they become increasingly complex and sophisticated, and reach maturity during the third phase.

Teachers in the study indicated theft need to be respected for their ability to act responsibly and make good decisions. The teachers exhibited remarkable resiliency in maintaining their overall sense of empowerment with professional development providing support for the growth process.

The Hobbs (2004) empowerment model conceptualized the teachers' experiences and their perceived growth in empowerment.

Table 1: The Phases of Empowerment Model

Phase	Years of Teaching Experience	Characteristics
Initiating Empowerment	1-3	• Lack of preparation for entering the classroom and concurrent lack of awareness of professional development opportunities • Early experiences with decision-making • Increasing confidence that accompanied student success
Growth of Empowerment	4-8	• Growing awareness of professional development • Increasing self-efficacy through student success • Challenging contexts- both teaching and personal • Maturing sense of autonomy through involvement in decision-making
Sustaining Empowerment	9^{+}	• Appreciating lifelong learning • Redefining self-efficacy • Valuing relationships with peers • Impacting education through group involvement

Source: Adapted from Hobbs, M., *et al*., (2010).

Tony (2009) highlights the notion that the nature of work worldwide dictates that outcome or output largely depends on the emphasis or attention put onto the input of the organization. Therefore teacher performance (output) will largely depend on the level of teacher empowerment (input) provided.

Science Education

A major goal of science education today is fostering students' intellectual competencies, such as independent learning, problem-solving, decision-making and critical thinking (American Association for the Advancement of Science, 1994; National Research Council, 1996).

According to Russel and Harlen (1990), science is about understanding certain aspects of physical world around us and it involves testing and changing ideas about how natural and made things work.

It is a way of thinking, a way of understanding the world. It is a human endeavor, a personal way of exploring and knowing (Carin & Sund, 1985). Cain and Evans (1990) mentioned the nature of science in four components: (1) content or product, (2) process or method, (3) attitude, and (4) technology.

Science Process Skills

Science process skills are the skills that ensure active student participating, have students develop the sense of undertaking responsibility in their own learning, increase the permanence of learning, and also have students acquire research ways and methods, that is, they ensure thinking and behaving like a scientist (Ostlund, 1992).

SAPA grouped process skills into two types- basic and integrated. The basic (simpler) process skills provide a foundation for learning the integrated (more complex) skills. According to Jinks (1997), the integrated science process skills are more appropriate for children at grades four and above.

According to Padilla (1990), ***Basic Process Skills*** are (1) Observing, (2) Inferring, (3) Measuring, (4) Communicating**,** (5) Classifying**,** and (6) Predicting**.** And, ***Integrated Process Skills*** are (1) Controlling variables, (2) Defining operationally,(3) Formulating hypotheses,(4) Interpreting data, (5) Experimenting, and (6) Formulating models**.** Students should be introduced to these skills early in their school experiences because so much of their success in subsequent guided studies requires a sound understanding and appropriate use of these skills. Therefore, science teachers need to be expert in these process skills, and they also need to be expert in the effective teaching of these science process skills (Ango, 2002).

Methodology

In this study, quantitative and qualitative research methods were used. A set of questionnaire to collect the required data was developed based on **School Participant Empowerment Scale (SPES)** of Short and Rinehart (1992). The reliability coefficient (Cronbach α) was 0.98 for the teacher empowerment questionnaire and 0.87 for science teaching practice questionnaire which was developed based on literature.

Cluster sampling method was used. Three hundred and twenty lower secondary science teachers in Yangon Region participated in this study. The descriptive statistics was used to analyze the collected data. The level of knowledge, empowerment and teaching practice that perceived by teachers were determined as the item percent correct, mean value, standard deviations. Moreover, One-Way ANOVA, Tukey HSD test, the Pearson-product moment correlation coefficient, and Simultaneous multiple regression were utilized.

Findings

Investigating Science Teachers' Knowledge for Science Process Skills

Teacher's level of knowledge for science process skills was identified according to the range of average score percent as shown in Table 2.

Table 2: Number and Percentages of Participant Teachers Showing the Level of Knowledge for Science Process Skills (N=320)

Scoring Range	No. of Teachers (%)	Remark
<50%	111 (35%)	Below satisfactory level
50%-74%	200 (62%)	Satisfactory level
≥ 75%	9 (3%)	Above satisfactory level

Scoring Range : <50% = below satisfactory 50%-74% = satisfactory level
≥75% = above satisfactory

In science teachers' 20-item knowledge questionnaire, there are three parts: knowledge item (1,2,3,4,8,9, and 12) for basic process skills, item (5,6,7,10,11 and 13) for integrated process skills, and item (14,15,16,17,18,19, and 20) for science teaching methods. Science teachers' knowledge in these three parts was shown in Table 3.

Table 3: Number and Percentages of Participant Teachers in Science Teachers' Knowledge

No.	Parts	No. of items	IPC
1	Basic Process Skills	7	55.2%
2	Integrated Process Skills	6	32.7%
3	Teaching Methods	7	65.6%
Overall Science Teachers' Knowledge		**20**	**52.1%**

Investigating Lower Secondary Science Teachers' Empowerment

The descriptive results of science teacher's perceptions on empowerment were shown in Table 4.

Table4: Mean Values Showing Perceptions of Lower Secondary Science Teachers on Empowerment in Basic Education Schools (N=320)

No.	Elements	Mean (SD)
1.	Desire to Act	3.13 (.50)
2.	Ability to Act	2.94 (.44)
3.	Opportunity to Act	2.82 (.45)
	Empowerment	**2.96 (.42)**

Scoring Direction:

1.00-1.49= no empowerment 1.50-2.49= a little empowerment
2.50-3.49=somewhat empowerment 3.50-4.00= strong empowerment

According to Table 4, mean values for science teacher's empowerment was 2.96. Thus, science teachers' empowerment in this study was somewhat empowerment.

Mean values for perceptions of lower secondary science teachers onempowerment grouped by district were presented in Table 5.

Table 5: Mean Values Showing Perceptions of Lower Secondary Science Teachers on Empowerment Grouped by District (N= 320)

No.	**Dimensions**	**Mean (SD)**			
		District A	**District B**	**District C**	**District D**
1.	Desire to Act	3.20 (.40)	2.98 (.49)	3.18 (.55)	3.16 (.53)
2.	Ability to Act	3.01 (.40)	2.86 (.45)	2.92 (.47)	2.96 (.42)
3.	Opportunity to Act	2.87 (.49)	2.78 (.45)	2.82 (.45)	2.82 (.40)
	Empowerment	**3.03 (.38)**	**2.87 (.44)**	**2.97 (.45)**	**2.98 (.40)**

Scoring Direction:

1.00-1.49=no empowerment 1.50-2.49= a little empowerment

2.50-3.49=somewhat empowerment 3.50-4.00= strong empowerment

According to Table 5, all four groups of teachers perceived as having *somewhat empowerment* including desire to act, ability to act, and opportunity to act.

Table 6: One-Way ANOVA Result Showing Significantly Different Elements in Perceptions of Lower Secondary Science Teachers on Empowerment Grouped by District

Dimensions		**Sum of Squares**	***df***	**Mean Square**	***F***	***P***
Desire to act	Between Groups	2.59	3	.86	3.52	.015*
	Within Groups	77.41	316	.25		
	Total	79.99	319			

Note: *.The mean difference is significant at the 0.05 level.

n.s = no significance

Table 7: Tukey HSD Result Showing Multiple Comparison for the Perceptions of Lower Secondary Science Teachers on Desire to act Grouped by District

Variable	**(I) Group**	**(J) Group**	**Mean Difference (I-J)**	***p***
Desire to act	District B	District A	-.23*	.020*
		District C	-.20*	.047*
		District D	-.18	n.s

Note: *.The mean difference is significant at the 0.05 level.

n.s = no significance

Table 7 presents the results of Tukey HSD multiple comparison for the perceptions of lower secondary science teachers on desire to act grouped by district. As shown in Table 7, Tukey test shows that District B science teachers were significantly different from District A($p<0.05$, $d=-0.51$)and District C ($p<0.05$, $d=-0.38$) science teachers in the perceptions of lower secondary science teachers on desire to act among the science teachers grouped by district.

Table 8: Summary of One-Way ANOVA Result Showing Degree of Perceptions of Lower Secondary Science Teachers on Desire to act Grouped by District

No.	Dimensions	Mean (SD)				*F*	*P*
		District A	District B	District C	District D		
1.	Decision Making	3.05 (.51)	2.87 (.58)	3.08 (.58)	3.08 (.54)	2.76	.042*
2.	Professional Development	3.21 (.43)	2.96 (.52)	3.21 (.63)	3.18 (.57)	4.00	.008**
3.	Self-Efficacy	3.30 (.51)	3.02(.52)	3.25 (.59)	3.22 (.60)	3.85	.010**
4.	Autonomy	3.24 (.49)	2.96 (.55)	3.20 (.63)	3.12 (.65)	3.67	.013**

Note: *.The mean difference is significant at the 0.05 level.
**.The mean difference is significant at the 0.01 level.

Investigating Lower Secondary Science Teachers' Teaching Practice

Mean values for perceptions of lower secondary science teachers on teaching practice grouped by district were presented in Table 9.

Table 9: Mean Values Showing Perceptions of Lower Secondary Science Teachers on Teaching Practice Grouped by District (N= 320)

No.	Variable	Mean (SD)			
		District A	District B	District C	District D
1.	Science Teachers' Teaching Practice	3.97 (.57)	3.82 (.56)	3.89 (.52)	3.81 (.51)

Scoring Direction:
1.00-1.49=Low 1.50-2.49=Moderately Low 2.50-3.49= Satisfactory
3.50-4.49= Moderately High 4.50-5.00= High

According to Table 9, all four groups of teachers perceived as having moderately high level *teaching practice* mentioned in this study.

Table 10: One-Way ANOVA Result Showing Perceptions of Lower Secondary Science Teachers on Teaching Practice Grouped by Level of Knowledge

Variable		Sum of Squares	*df*	Mean Square	*F*	*P*
Science Teachers' Teaching Practice	Between Groups	2.72	2	1.36	4.74	.009**
	Within Groups	90.80	317	.29		
	Total	**93.51**	**319**			

Note:.**The mean difference is significant at the 0.01 level.

Table 10 shows the ANOVA result for the perceptions of lower secondary science teachers on teaching practice in their subject. According to table 10, there was significant variation on the perceptions of lower secondary science teachers on teaching practice among the teachers grouped by level of knowledge (df= 2, F= 4.74, P<.01).

Table11: Tukey HSD Result Showing Multiple Comparison for the Perceptions of Lower Secondary Science Teachers on Teaching Practice Grouped by Level of Knowledge

Variable	(I) Knowledge Level	(J) Knowledge Level	Mean Difference (I-J)	*p*
Science Teachers' Teaching Practice	Group A	Group B	-.18*	.011**
		Group C	-.31	n.s

Note: **.The mean difference is significant at the 0.01 level.
n.s = no significance Group A=Below satisfactory level Group B= Satisfactory level
Group C = Above satisfactory level

Table 11 presents the results of Tukey HSD multiple comparison for the perceptions of lower secondary science teachers on teaching practice grouped by level of knowledge. As shown in Table 11, Tukey test shows that group A was significantly different from group B (p<0.01, d=-0.33) in the perceptions of lower secondary science teachers on teaching practice among the science teachers grouped by level of knowledge.

Table 12: Summary of One-Way ANOVA Result Showing Degree of Perceptions of Lower Secondary Science Teachers on Teaching Practice Grouped by Level of Knowledge

No.	Variable	Mean (SD)			*F*	*P*
		Group A	**Group B**	**Group C**		
1.	Science Teachers' Teaching Practice	3.75(.59)	3.93(.51)	4.06(.44)	4.74	.009**

Note: **.The mean difference is significant at the 0.01 level.

Table 13: One-Way ANOVA Result Showing Perceptions of Lower Secondary Science Teachers on Teaching Practice Grouped by Level of Empowerment

Variable		Sum of Squares	*df*	Mean Square	*F*	*P*
Science Teachers' Teaching Practice	Between Groups	10.04	3	3.35	12.67	.000***
	Within Groups	83.47	316	.27		
	Total	93.51	319			

Note: *****.**The mean difference is significant at the 0.001 level.

Table 13 shows the ANOVA result for the perceptions of lower secondary science teachers on teaching practice in their subject. According to the table 13, there was significant variation on the perceptions of lower secondary science teachers on teaching practice among the teachers grouped by the level of empowerment (df=3, F=12.67, P<.001).

Table 14: Tukey HSD Result Showing Multiple Comparison for the Perceptions of Lower Secondary Science Teachers on Teaching Practice Grouped by Level of Empowerment

Variable	(I) Empowerment Level	(J) Empowerment Level	Mean Difference (I-J)	*p*
Science Teachers' Teaching Practice	Group B	Group A	-.73	n.s
		Group C	-.61*	.000***
		Group D	-.80*	.000***

Note: ***.The mean difference is significant at the 0.001 level.

n.s = no significance

Group A= no empowerment Group B= a little empowerment

Group C= Somewhat empowerment Group D= strong empowerment

Table 14 presents the results of Tukey HSD multiple comparison for the perceptions of lower secondary science teachers on teaching practice grouped by level of empowerment. As shown in Table 14, Tukey test shows that group B was significantly different from group C (p<0.001, d=-1.1) and group D (p<0.001, d=-1.48) in the perceptions of lower secondary science teachers on teaching practice among the science teachers grouped by level of empowerment.

Table 15: Summary of One-Way ANOVA Result Showing Degree of Perceptions of Lower Secondary Science Teachers on Teaching Practice Grouped by Level of Empowerment

No.	Items	Mean (SD)				*F*	*P*
		Group A	Group B	Group C	Group D		
1.	Science Teachers' Teaching Practice	4.03 (.21)	3.30(.59)	3.91(.51)	4.10 (.49)	12.67	.000***

Note: ***.The mean difference is significant at the 0.001 level.
n.s = no significance

Relationship between Perceived Science Teachers' Empowerment and Their Teaching Practice

Table 16 shows that the correlation between science teachers' empowerment and their teaching practice was statistically significant because the 'sig' is less than 0.01. There is an association between science teachers' empowerment and their teaching practice (r=.430, p<.01).

Table 16: Correlations between Perceived Science Teachers' Empowerment and Their Teaching Practice

Two Groups	Science Teachers' Empowerment	Science Teachers' Teaching Practices
Science Teachers' Empowerment	1	.430**
Science Teachers' Teaching Practice	.430**	1

**Correlation is significant at the 0.01 level (2-tailed).

The Potential Factors Affecting Teachers' Empowerment

Five variables were identified as predictors of science teachers' teaching practices: Decision Making (DM), Professional Development (PD), Status (S), Self-Efficacy (SE), and Autonomy (A). Simultaneous multiple regression was conducted to investigate the best predictors of teaching practice. The means, standard deviations, and inter correlations are shown in Table 17. The combination of variables to predict teaching practice included Decision Making (DM), Professional Development (PD), Status (S), Self-Efficacy (SE), and Autonomy (A), F (5,314)= 17.653, p<.01.

Table 17: Means, Standard Deviations, and Inter-correlations for Teaching practice and Predictors Variables (N=320)

Variables	**Mean**	**SD**	**DM**	**PD**	**S**	**SE**	**A**
Teaching Practice	3.87	.54	.34**	.44**	.30**	.38**	.42**
Predictor Variables							
DM	2.86	.49	--	.75**	.55**	.64**	.61**
PD	2.95	.46		--	.68**	.77**	.73**
S	3.07	.50			--	.73**	.71**
SE	3.00	.46				--	.83**
A	2.95	.51					--

**P<.01 *P<.05

According to Table 17, it was found that science teachers' teaching practice was positively and significantly correlated with Decision Making (r=.34, p<.01), Professional Development (r=.44, p<.01), Status (r=.30, p<.01), Self-Efficacy (r=.38, p<.01), and Autonomy (r=.42, p<.01).

Table 18: Simultaneous Multiple Regression Analysis for Teacher Empowerment Dimensions Predicting Teaching Practice

Dimensions	**B**	**SEB**	**β**	***P***
Decision Making	-.01	.09	-.01	n.s
Professional Development	.39	.11	.32**	.001
Status	-.10	.08	-.09	n.s
Self-Efficacy	-.05	.12	-.04	n.s
Autonomy	.31	.10	.29**	.002
Constant	2.30	.20		.000

Note: R=.47, R^2=.22, F(5,314)= 17.65,
*P< .05, **P< .01, *** P< .001, n.s=no significance

The Regression Equation is :

Science Teaching Practice = 2.30 - .01DM + .39 PD - .10S - .05SE + .31A

The beta coefficients were presented in Table 18. Professional Development and Autonomy significantly predicted teaching practice when all five variables were included. The adjusted R squared value was .22 (R=.47). This indicates that 22% of the variance in teaching practices was explained by the model, and this is a large effect according to Cohen (1988).

According to the β weights, Professional Development variable (β=.32, p<.01) appears to be the best predictor of science teachers' teaching practice. Autonomy variable (β=.29, p<.01) appears to be the second predictor of science teachers' teaching practice. Moreover, decision making, status, and self-efficacy appear to be important for science teachers' teaching practice.

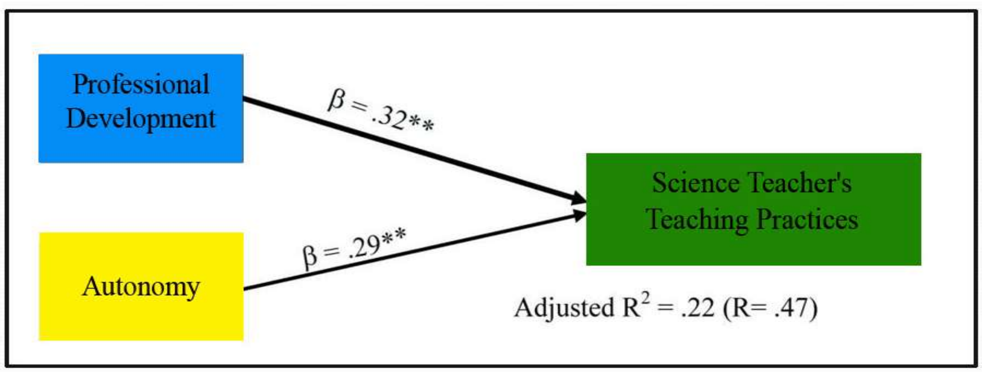

Figure 2: Potential Factors Affecting Science Teachers' Teaching Practice

Based on the quantitative and qualitative findings, the review of relevant literature, and validation by 24 expert educators, the developed teacher empowerment model for improving teaching practices of lower secondary science teachers in Yangon Region was illustrated (see Figure 3).

In addition, the following suggestions and recommendation were drawn to improve the lower secondary teachers' science teaching practice in Yangon region.

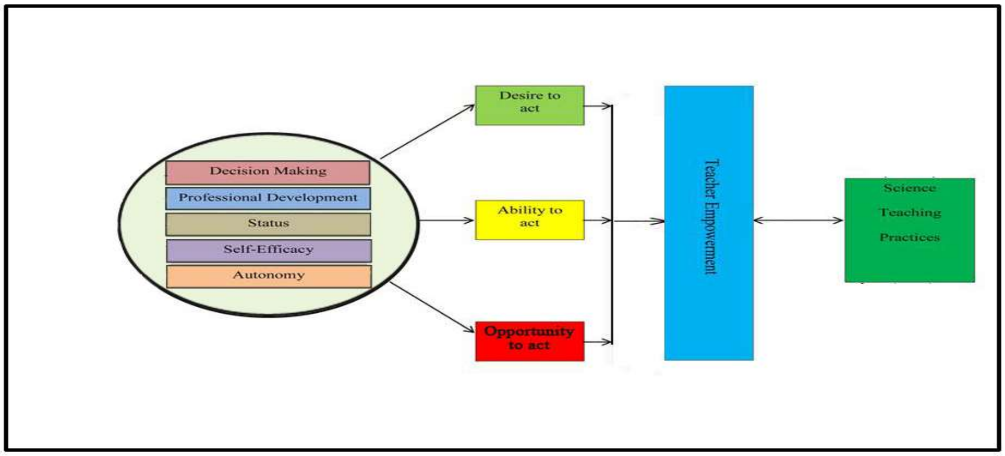

Figure 3: Developed Teacher Empowerment Model for Improving Teaching Practice of Lower Secondary Science Teachers

↔ Inter-relationship between two variables

→ Relationship between two variables

Recommendation

The following recommendations are based on the analyses of the research findings.

- School principals should create an environment that fostered establishing and maintaining school participative decision–making in the schools.
- School principals should provide opportunities the teachers to become powerful enough to engage in, share control of, and influence events and organization affecting their lives.
- School Principals should frequently use praise to recognize the contributions of teachers, the difficulties and challenges associated with the work of teachers, and recognize special successes in the schools.
- School principals should make efforts in supporting teaching aids and instructional materials, and monitoring teachers to use them in teaching science.

- Teachers should be supported professional development activities, programs, trainings and allowances to develop their science knowledge, skills and attitude in order to improve teaching science. And then, as self-directed teacher professional development, teachers should involve in initiating and designing their own professional development and share materials and ideas as well as discuss challenges and solutions.
- Teachers should be empowered and given the freedom or autonomy to determine the best possible treatment for their students learning problems in the schools.
- Teachers should be provided workshops or training to develop the knowledge of science process skills, especially integrated process skills.
- Teachers should be supported science materials, facilities, and resources to well-implement teaching science.
- Teachers should use available resources as teaching aids in teaching science lesson effectively.
- A classroom should be used as a storage space for science materials and teaching aids, and teachers should use and maintain them with a logbook.
- Non-instructional workloads of teachers should be eliminated to have more time in teaching science.
- Not only teacher-pupil ratio but also teacher-classroom ratio should be considered in order to provide students inquiry learning opportunities.
- Text books should be reviewed to correct the spelling errors and to modify figures to be clear and colorful.
- Formative and diagnosis assessment should be emphasized in teaching science in order to be continuous reflection on learning science and to identify students' weakness and misconceptions in teaching science.
- Activity-based assessment system for science achievement should be used to match with how science should be taught.

Need for Further Research

The studies in all subject areas need to be conducted to investigate how to give empowerment for different subject teachers to improve their teaching practice.

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INVESTIGATION OF STUDENT TEACHERS' SELF-EFFICACY BELIEFS AND ATTITUDES TOWARDS TEACHING PROFESSION IN SAGAING UNIVERSITY OF EDUCATION

Zin Nwe Than*

Abstract

The purpose of this study was to examine the student teachers' self-efficacy beliefs and attitudes towards teaching profession in Sagaing University of Education. The sample of the study consisted of 380 student teachers who were studying at BEd final year course from Sagaing University of Education. Scale of Self-Efficacy Beliefs and Scale of Attitudes towards Teaching Profession were used as data gathering tools. Descriptive statistics, independent samples *t*-tests, and ANOVA have been used in analyzing the data. According to the findings, student teachers had high levels of self-efficacy in all three dimensions: "Instructional Strategies", "Classroom Management" and "Student Engagement". Again, there was a significant difference in self-efficacy beliefs of "Classroom Management" between student teachers who were 20-21 years old and 24-25 years old. In addition, it was also been discovered that student teachers' attitudes towards teaching profession were good levels in "Professional Choice", "Developing Attitudes during Training Period", "Commitment towards Teaching Profession" and "Professional Expectations" but they had a very good level in "Professional Pride". To sum up, student teachers from Sagaing University of Education had high levels of self-efficacy beliefs and good attitudes towards teaching profession.

Keywords: Self-Efficacy, Attitude, Professional Choice, Professional Pride

Introduction

Efficacy is one of the more popular research terms used in educational studies to show a teacher's beliefs in his/her abilities and how those beliefs can ultimately change the level of success students may experience within the classroom. Efficacy beliefs shape how teachers behave in the classroom and impact student learning (Martin, Sass, & Schmitt, 2012; cited in Chandler, 2014). Teachers' beliefs in their abilities to instruct students and influence student performance are very strong indicators of instructional effectiveness (Bandura, 1997). Bandura (1989) suggests that efficacious individuals hold

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the control of the events affecting their lives and display such behaviors allowing them to realize the desired outcomes.

Teachers' actions and behaviors are related to their beliefs, perceptions, assumptions and motivational levels. One of the important beliefs considered to be significantly effective in students and teachers outcomes is teachers' feelings of efficacy (Chaco, 2005; cited in Cerit, 2010). Self-efficacy beliefs of the teacher can enhance his/her ability to respond effectively to stressful and challenging situations (Bray-Clark & Bates, 2003). Similarly, teachers with low levels of efficacy often expend little effort in finding materials and planning lessons that challenge students, slow little persistence with students having difficulty and display variety in their teaching approaches, whereas teachers with high levels of efficacy are more likely to seek out resources and develop challenging lessons, persist with students who are struggling to teach in multitude ways that promote student understanding (Deemer, 2004; cited in Adedoyin, 2010).

Furthermore, teachers with a high sense of self efficacy are confident that even the most difficult students can be reached if they exert extra effort; teachers with low self-efficacy, on the other hand, feel a sense of helplessness when it comes to deal with difficult and unmotivated students (Gibson & Demob & Dembo, 1984; cited in Adedoyin, 2010). Therefore, teacher self-efficacy is very important because it has been linked to positive teacher behavior in the classroom (Guskey, 1988; Milner, 2002; cited in Hicks, 2012) and increased enthusiasm for teaching (Fuchs & Bishop, 1992; cited in Hicks, 2012).

On the other hand, attitudes towards the profession of teachers plays a major role in improving the quality of education to be able to successfully fulfill the teaching profession. Attitude can be defined as an indicator of a person's feelings towards a particular issue with understanding and motivating and as a feature to show a positive or negative behavior, so attitude gives direction to behavior. Especially developing for a professional attitude is the most important determinant of an individual's success in the profession. Therefore, having the knowledge and skills related to the area of a qualified teacher is not enough, the attitudes towards the teaching profession must be positive, too. All in all, teachers' having positive attitudes towards the teaching profession is important in training of qualified teachers in the future (Donmuş, Akpinar, & Eroğlu, 2015).

Attitudes of teachers toward profession influence their professional competencies and success **(**Richardson & Watt, 2005; cited in Elaldı & Yerliyurt, 2016) in their planning, decision making and classroom practices (Hooks *et al*., 2006; Semerci & Semerci, 2004;cited in Elaldı & Yerliyurt, 2016). Since teaching is a challenging profession and only those teachers that can shoulder the heavy responsibilities of nation building, the raising teacher must conceivably get the highest priority. The teaching profession requires teachers who have cognitive, affective and psychomotor qualifications. The levels of these qualifications, will affect teacher candidates' success in the profession. Therefore, in teacher training, a positive attitude about the profession is of great importance (Tural & Kabadayi, 2014; cited in BADEMCIOGLU, KARATAS &ALCI, 2014).

By keeping in view the importance of teachers' self-efficacy beliefs and attitudes towards teaching profession, the present study is designated to investigate the student teachers' self-efficacy beliefs and attitudes towards teaching profession in Sagaing University of Education.

Objectives of the Study

With reference to the title, the general objective and specific objectives are as follows:

General Objective

- To examine the student teachers' self-efficacy beliefs and attitudes towards teaching profession in Sagaing University of Education

Specific Objectives

- To explore the levels of self-efficacy beliefs as perceived by student teachers themselves,
- To examine the self-efficacy beliefs of student teachers based on their gender, age group, subject of study and training course,
- To the attitudes of student teachers towards teaching profession, and
- To investigate the student teachers' attitudes towards teaching profession based on their gender, age group, subject of study and training course

Research Questions

1. What are the levels of self-efficacy beliefs as perceived by student teachers themselves?
2. Do the self-efficacy beliefs of student teachers show variations based on their gender, age group, subject of study and training course?
3. What are the attitudes of student teachers towards teaching profession?
4. Do the attitudes of student teachers towards the profession show variations based on their gender, age group, subject of study and training course?

Delimitations of the Study

1. Present study was delimited to the final year BEd students (junior and senior students) of Sagaing University of Education only.
2. The present study focused on professional attitude as perceived by the individual and not through the indicators of professional attitude.
3. Tool used for *Attitude Scale* was a self-reporting device and thus had an inherent limitation due to its nature.

Definitions of Key Terms

The terms used throughout the current study are identified below for clarity and understanding.

- ***Self-Efficacy*** refers to the level of confidence that one has about one's own ability to perform a certain task (Bandura, 1997).
- ***Attitude*** is defined as an individual's positive or negative emotional tendency towards people, objects, events and ideas (Papanastasiou, 2002; cited in Tok, 2012).
- ***Professional Choice or Career Choice*** means the selection of a particular path or vocation in terms of career. This is usually influenced by parental guidance, vocational counselling, and training opportunities. It is also affected by personal preference and identification with figures and role models (Nugent, 2013).
- ***Professional Pride*** refers to a feeling of deep pleasure or satisfaction derived from one's vocation or career.

Theoretical Framework

Self-Efficacy Beliefs

According to Social Cognitive Theory, a person's behavior is a result of a choice to act based on cognitively processed information about the self, the environment, and the likely consequences of the behavior. In contrast to the stimulus/response premise of behaviorism, social cognitive theory suggests that a person both shapes and is shaped by his/her actions and environment. Bandura refers to this mutual influence as triadic reciprocity (Bandura, 1977, 1986; cited in Lively, 1994).

Beliefs are vital because they can enable an individual to be focused on what they are doing. Pajares (1992; cited in Moalosi & Forcheh, 2015) asserted, "Beliefs are indicators of the decisions individuals make throughout their lives". Therefore, beliefs can also influence teachers to make decision in relation to their work, especially on their own abilities to influence student learning and performance. They can plan; prepare their instructional methods of teaching that effectively impact students learning during their career as teachers.

Attitudes towards Teaching Profession

According to All port (1938:28; cited in Tok, 2012), "an attitude is a mental and neural set of readiness, exerting a directive dynamics influence upon the individuals response to all objects and situation with which it is related". People have attitudes towards all objects, which may be positive, negative, or neutral (Fishbain, 1967; cited in Hussain, 2004). People's attitudes towards their profession have an effect on their performance. These perspectives are also valid for the teaching profession (Sparks, 1979; cited in Tok, 2012).

An individual who has associated positive affect or feeling with some psychological object is said to like that object or to have a favourable attitude towards the object. An individual who has associated negative affect with the same psychological object would be said to dislike that object or to have an unfavourable attitude towards that object. Attitude of an individual can be assessed through two methods such as seeking opinions and observing behaviour. Seeking opinions is a common and widely used approach of judging the attitude. It can be through asking direct questions or through different attitude scales.

Review of the Related Literature

Literature review reveals that the examination of educational beliefs and attitudes of pre-service teachers is important due to at least two reasons: First, as a student, pre-service teachers' beliefs and attitudes impact their academic success (Akey, 2006; Pajares, 1992; cited in Bedel, 2016).And second, pre-service teachers' beliefs have a major influence on their teaching process when they begin to teach (Garvis, Fluckiger & Twigg, 2011; Raths, 2001; cited in Bedel, 2016). Thus, understanding of efficacy beliefs and attitude toward teaching in pre-service teachers have potential importance for the improvement of educational quality.

"Efficacy beliefs are the product of cognitive processing of diverse sources of efficacy information conveyed enactively, vicariously, socially and physiologically. Once formed, efficacy beliefs contribute to the quality of human functioning in diverse ways. They do so by enlisting cognitive, motivational, affective, and decisional processes through which accomplishments are realized" (Bandura, 1997). Bandura (1997) suggests that efficacy beliefs are formed due to four influences: enactive mastery experiences (an individual's performance of tasks related to the efficacy focus), vicarious experiences (observation of others performing the task), verbal persuasion (positive discussion of the individual's ability to perform the task) and physiological and emotional states (responses to the task which are then interpreted by the individual as an indication of their efficacy). Tschannen-Moran & Hoy (2001; cited in Wolters & Daugherty, 2007) found that teachers' sense of efficacy was best conceptualized as three related dimensions reflecting teachers' sense of efficacy for instruction, management and engagement.

Attitude is a tendency to react in a particular manner towards the stimuli (Anastasi, 1957; cited in BHARGAVA & PATHY, 2014). It is a dynamic entity which is subject to change. It is a deciding factor of the teacher's performance. Attitude is defined as a state of readiness shaped through the experience and influences the response of individual towards the stimuli. It is precursor of the behaviour and varies from favourable to unfavourable through neutral. Attitude is made up of three components affective, behavioural and cognitive hence acts as a yardstick of the individual behaviour (Feldman, 1985; cited in BHARGAVA & PATHY, 2014).

Attitude towards the teaching profession is a pivotal quality that determines a teacher's willingness to develop and grow as a professional. The more positive and enthusiastic teachers are about teaching, the more likely their students will be enthusiastic about learning (Edmonton Public Schools, 1993; Strongee*t. al*., 2004; cited in Tok, 2012).

Methodology

Participants

This study focuses on student teachers attending at the BEd final year courses (5101 and 5102) at Sagaing University of Education during 2016-2017 Academic Year. The sample consists of 380 student teachers with the bifurcation of 147 (38.7%) male and 233 (61.3%) female student teachers. Majority of the student teachers that accounted to 194 (51.05%) are between the age of 22-23, 168 (44.21%) of them are in the age of 20-21, and 18 (4.74%) of them are between the age of 24-25.

Out of 380 student teachers, 108 (28.4%)student teachers took art subjects, 226 (59.5%)student teachers took science subjects and 20 (5.3%) student teachers took art and science combinations but 26 (6.8%)student teachers did not describe their specialized subjects (See: Table 1).

Table 1: Demographic Information of Participants (N=380)

Gender	Male	147 (38.7%)
	Female	233 (61.3%)
Age	20-21	168 (44.21%)
	22-23	194 (51.05%)
	24-25	18 (4.74%)
Subject of Study	Art	108 (28.4%)
	Science	226 (59.5%)
	Art & Science Combination	20 (5.3%)
	No Response	26 (6.8%)
Training Course	5101(Junior Students)	188 (49.5%)
	5102 (Senior Students)	192 (50.5%)

Research Instruments

In this study, two research instruments; "*Teachers' Sense of Efficacy Scale*" developed by Tschannen-Moran and Hoy (2001) to explore the self-efficacy beliefs of student teachers and "*Attitude Scale for Prospective Teachers*" developed by the present study researcher to investigate the student teachers' attitudes towards teaching profession, were mainly utilized.

Teachers' Sense of Efficacy Scale

Teachers' Sense of Efficacy Scale developed by Tschannen-Moran and Hoy (2001; cited in Sunjin, 2011) is a 24 –item instrument, assessed along a 9-point continuum with anchors at 1—Nothing, 3—Very Little, 5—Some Influence, 7—Quite A Bit, and 9—A Great Deal. However, 5- point Likert scale, ranging from 1 (Completely Disagree) to 5 (Completely Agree), was used in this study. This scale has previously been used with pre-service teachers before and after professional experience (Tschannen-Moran & Woolfolk Hoy, 2001; cited in Pendergast, Garvis & Keogh, 2011), and thus was considered valid for this study. In addition, this scale has consistently produced high rating for reliability. The *Teachers' Sense of Efficacy Scale* consists of three subscales: Instructional Strategies, Classroom Management and Student Engagement.

Attitude Scale for Prospective Teachers

A self-developed survey questionnaire, *Attitude Scale for Prospective Teachers* was used for data collection of student teachers' attitudes towards teaching profession. Before developing this attitude scale, many related studies done in the field of attitude towards teaching profession both in Myanmar and in other countries were reviewed. In addition, the researcher discussed openly with 30 final year student teachers about the reasons of choosing teaching profession as their career, their attitudes towards teaching profession at the present time, and expectations of a teacher's life.

Based on the responses of student teachers and related literature, the tool consisting of 30 items with five dimensions viz. *Professional or Career Choice, Changing Attitude during Teacher Training Period, Commitment towards Teaching Profession, Professional Pride* and *Professional Expectations*, was developed. It is a five point scale with strongly disagree to strongly agree. Attitude towards teaching profession denotes the positive or negative feeling or outlook associated towards teaching. Hence the statements to measure this dimension were constructed in terms of the above mentioned areas, whether it is positive or negative. There were 14 negative and 16 positive statements in this scale.

In order to measure the reliability of instruments, a pilot study was conducted and the Pearson product-moment correlation method (Average Item Total Correlation) was used to check for internal consistency reliability. The validity content was determined by a panel of four judges that rated the overall representativeness of each item. After analyzing the collected data in items of reliability, the researcher reviewed and revised the items which had less than 0.3 correlation coefficient. In this study, the coefficient of correlation for *Teachers' Sense of Efficacy Scale* was .926. Similarly, the coefficient of correlation for *Attitude Scale for Prospective Teachers* was .86.

Data Collection Procedures

After reading the literature related to the topic, relevant instruments were adapted and constructed to collect the required data. The questionnaire including two instruments was administered to 380 student teachers studying in BEd final year courses (5101 and 5102) at Sagaing University of Education. The preliminary information of the student teachers along with the questionnaire was administered by giving some instructions to the student teachers. The filled in questionnaires were collected afterwards.

Data Analysis

Using SPSS, descriptive statistics such as means, and standard deviations for each variable were calculated concerning the levels of student teachers' self-efficacy beliefs and attitudes towards teaching profession. To determine the levels of student teachers' self-efficacy beliefs, the mean value was identified as the mean value from 1.00 to 2.33 was "Low Level", the mean value from 2.34 to 3.67 as "Moderate Level" and the mean value from 3.68 to 5.00 as "High Level". Similarly, the results of student teachers' attitudes towards teaching profession were evaluated based on the following bands: 4-5 (very good), 3-4 (good), 2-3 (moderate) and1-2 (poor). Analysis of variance (ANOVA) and independent samples *t*-test were also used to determine whether there is a significant difference in student teachers' self-efficacy beliefs and attitudes towards teaching profession.

Findings

Self-Efficacy Beliefs

Based on the student teachers' responses, all student teachers from two training courses (5101 and 5102) had the high levels of self-efficacy beliefs in "Instructional Strategies", "Classroom Management" and "Students Engagement".

Table 2: Mean Scores of Self-Efficacy Beliefs Perceived by Student Teachers

Dimension / Training Course	Instructional Strategies	Classroom Management	Student Engagement	**Self-Efficacy**
5101(n1=188)	3.71(.552)	3.66(.500)	3.68(.501)	3.69 (.464)
5102 (n2=192)	3.74(.412)	3.69(.444)	3.69(.451)	3.71 (.373)
Total (N=380)	3.73(.483)	3.68 (.471)	3.69 (.475)	3.7 (.418)

1-2.33=low self-efficacy 2.34-3.67=moderate self-efficacy 3.68-5=high self-efficacy

Table 3 shows the mean scores of student teachers' self-efficacy beliefs based on their gender, age and subject of study. According to this table, male student teachers had the high levels of self-efficacy beliefs in all three dimensions: "Instructional Strategies", "Classroom Management" and "Students Engagement". However, female student teachers had the high levels of self-efficacy beliefs in two dimensions such as "Instructional Strategies", and "Students Engagement" but they had moderate level of self-efficacy beliefs in "Classroom Management".

Table 3: Mean Scores of Student Teachers' Self-Efficacy Belief based on their Gender, Age and Subject of Study

Dimension	Gender		Age			Subject of Study			
	Male	**Female**	**20-21**	**22-23**	**24-25**	**Art**	**Science**	**A & S**	**NR**
Instructional Strategies	3.75 (.543)	3.72 (.441)	3.72 (.511)	3.72 (.448)	3.97 (.542)	3.68 (.457)	3.75 (.483)	3.72 (.510)	3.76 (.577)
Classroom Management	3.71 (.523)	3.66 (.435)	3.61 (.453)	3.72 (.451)	3.89 (.485)	3.68 (.487)	3.69 (.441)	3.56 (.677)	3.71 (.494)
Student Engagement	3.69 (.542)	3.69 (.428)	3.65 (.487)	3.7 (.466)	3.88 (.415)	3.7 (.461)	3.69 (.474)	3.6 (.536)	3.69 (.514)
Self-Efficacy	3.71 (.487)	3.69 (.369)	3.66 (.438)	3.71 (.397)	3.91 (.401)	3.69 (.414)	3.71 (.403)	3.63 (.542)	3.72 (.478)

1-2.33=low self-efficacy 2.34-3.67=moderate self-efficacy 3.68-5=high self-efficacy
Note: **A & S=** Art and Science Combination **NR=** No Response

Similarly, self-efficacy beliefs of student teachers from 22-23 age group and 24-25 age group were high levels in all three dimensions of self-efficacy. On the other hands, self-efficacy beliefs of student teachers from 20-21 age group were high level in "Instructional Strategies" but the level of self-efficacy beliefs of remaining two dimensions were moderate levels.

Again, student teachers who took art and science combinations had moderate levels of self-efficacy beliefs in "Classroom Management" and "Students Engagement" although they had high level of self-efficacy beliefs in "Instructional Strategies".

In order to investigate the significant differences in self-efficacy beliefs of student teachers based on their gender and training course, the independent samples *t*-test was examined. According to Table 4, there was no significant difference in the perceptions of male and female student teachers about their self-efficacy beliefs.

Table 4: Independent Samples *t*-Tests Results for Self-Efficacy Beliefs between Male and Female Teachers

Dimensions	Gender	M	*t*	*df*	*p*	Mean Differences	Result
Instructional Strategies	Male	3.75	.555	378	.579	.028	ns
	Female	3.72					
Classroom Management	Male	3.71	.910	269.100	.364	.047	ns
	Female	3.66					
Student Engagement	Male	3.69	.092	258.482	.927	.005	ns
	Female	3.69					
Self-Efficacy	Male	3.71	.570	250.354	.569	.027	ns
	Female	3.69					

Accordingly, there was no significant difference in the perceptions of student teachers from 5101 and 5102 training course concerning their self-efficacy beliefs (See: Table 5).

Table 5: Independent Samples *t*-Tests Results for Self-Efficacy Beliefs between Two Training Courses

Dimensions	Course	M	*t*	*df*	*p*	Mean Differences	Result
Instructional Strategies	5101	3.71	-.606	328.917	.545	-.031	ns
	5102	3.74					
Classroom Management	5101	3.66	-.605	.378	.546	-.029	ns
	5102	3.69					
Student Engagement	5101	3.68	-.162	.378	.871	-.008	ns
	5102	3.69					
Self-Efficacy	5101	3.69	-.519	343.060	.604	-.023	ns
	5102	3.71					

In order to study whether there was a significant difference in the perceptions of student teachers on their self-efficacy beliefs according to their age or not, ANOVA was employed to analyze the data. When analyzing the results from Table 6, it was found that the student teachers' perceptions of their self-efficacy beliefs vary in one dimension, "Classroom Management" (p<.05) and overall self-efficacy (p<.05) among their age groups. However, there were no different perceptions in their self-efficacy beliefs of "Instructional Strategies" and "Students Engagement" among age groups.

Table 6: ANOVA Results for Self-Efficacy Beliefs Perceived by Student Teachers among Age Groups

Variable		Sum of Squares	*df*	*Mean Square*	*F*	*p*	Result
Instructional Strategies	Between Groups	1.054	2	.527	2.277	.104	ns
	Within Groups	87.267	377	.231			
	Total	**88.321**	**379**				
Classroom Management	Between Groups	1.865		.932	4.274	**.015**	s*
	Within Groups	82.246	377	.218			
	Total	**84.111**	**379**				
Student Engagement	Between Groups	1.021	2	.510	2.277	.104	ns
	Within Groups	84.495	377	.224			
	Total	**85.516**	**379**				
Self-Efficacy	Between Groups	1.151	2	.575	3.328	**.037**	s*
	Within Groups	65.177	377	.173			
	Total	**66.328**	**379**				

In order to find out which particular groups had the greatest differences, Post Hoc Multiple Comparison Test (Turkey HSD) was conducted. The results were shown in Table 7.

Table 7: Results of Multiple Comparisons for Student Teachers' Self-Efficacy Beliefs among Age Groups

Dimension	(I) Age	(J) Age	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Classroom Management	24-25	20-21	.278*	.116	**.044**	.01	.55
		22-23	.171	.115	.298	-.10	.44
Self-Efficacy	24-25	20-21	.255*	.103	**.037**	.01	.50
		22-23	.198	.102	.131	-.04	.44

According to the findings, there were significant differences in the perceptions of "Classroom Management" and overall "Self-Efficacy" between student teachers from "24-25" age group and "20-21" age group. In other words, the mean values for self-efficacy beliefs of student teachers from"24-25" age group were higher than those of student teachers' perceptions from "20-21" age group.

In order to study whether there was a significant difference in the perceptions of student teachers on their self-efficacy beliefs according to their specialized subjects or not; ANOVA was employed to analyze the data. When analyzing the results from Table 8, it was found that there was no significant difference in self-efficacy beliefs of student teachers based on their subject of study (See: Table 8).

Table 8: ANOVA Results for Student Teachers' Self-Efficacy Beliefs based on their Subject of Study

Variable		**Sum of Squares**	***df***	***Mean Square***	***F***	***p***	**Result**
Instructional Strategies	Between Groups	.346	3	.115	.493	.688	ns
	Within Groups	87.975	376	.234			
	Total	**88.321**	**379**				
Classroom Management	Between Groups	.300	3	.100	.449	.718	ns
	Within Groups	83.810	376	.223			
	Total	**84.111**	**379**				
Student Engagement	Between Groups	.178	3	.059	.261	.854	ns
	Within Groups	85.338	376	.227			
	Total	**85.516**	**379**				
Self-Efficacy	Between Groups	.141	3	.047	.267	.849	ns
	Within Groups	66.186	376	.176			
	Total	**66.328**	**379**				

Attitudes towards Teaching Profession

To collect the student teachers' attitudes towards teaching profession, a self-developed survey questionnaire, *Attitude Scale for Prospective Teachers* was used. Table 9 describes the mean scores of student teachers' attitudes towards teaching profession.

Table 9: Mean Scores of Student Teachers' Attitudes towards Teaching Profession

Dimension / Training Course	**D1**	**D2**	**D3**	**D4**	**D5**	**ATTITUDE**
5101(Junior)	3.53 (.628)	3.82 (.550)	3.79 (.551)	4.03 (.583)	3.85 (.633)	3.81 (.434)
5102 (Senior)	3.48 (.584)	3.98 (.488)	3.89 (.440)	4.17 (.524)	3.99 (.555)	3.91 (.379)
Final Year	3.5 (.605)	3.91 (.524)	3.85 (.498)	4.11 (.557)	3.93 (.596)	3.86 (.409)

1-2=poor 2-3=moderate 3-4=good 4-5=very good

Note: **D1=**Professional or Career Choice
D2=Changing Attitude during Teacher Training Period **D4**=Professional Pride
D3=Commitment towards Teaching Profession **D5**=Professional Expectations

According to the Table 9, BEd final year student teachers from Sagaing University of Education had good attitudes in four dimensions such as "Professional or Career Choice", "Changing Attitude during Teacher Training Period", "Commitment towards Teaching Profession" and "Professional Expectations" but they had very good attitudes in "Professional Pride". In summary, they had good attitudes towards teaching profession according to the overall mean score of attitude.

Table 10 presents the mean scores of student teachers' attitudes towards teaching profession based on their gender, age and subject of study. According to the responses, both male and female student teachers had good attitudes towards their teaching profession. Similarly, student teachers from various age groups also had good attitudes towards their teaching profession. In addition, it was found that student teachers who studied different specialized subjects had good attitudes towards their teaching profession.

Table 10: Mean Scores of Student Teachers' Attitudes towards Teaching Profession based on their Gender, Age and Subject of Study

Dimension	**Gender**		**Age**			**Subject of Study**			
	Male	**Female**	**20-21**	**22-23**	**24-25**	**Art**	**Science**	**A & S**	**NR**
ATTITUDE	3.74 (.465)	3.93 (.349)	3.84 (.404)	3.87 (.419)	3.96 (.326)	3.98 (.329)	3.80 (.435)	3.80 (.366)	3.87 (.413)

1-2=poor 2-3=moderate 3-4=good 4-5=very good

In order to investigate the significant differences in attitudes of student teachers towards their profession based on their gender and training course, the independent samples *t*-test was utilized. According to Table 11, there was no significant difference in the perceptions of male and female student teachers about their "Professional or Career Choice" and "Commitment towards Teaching Profession". However, there were statistically significant differences in the perceptions of "Changing Attitude during Teacher Training Period", "Professional Pride", "Professional Expectations" and overall "ATTITUDE**"** between male and female student teachers. Especially, the mean values for those dimensions perceived by female student teachers were higher than those of male student teachers.

Table 11: Independent Samples *t*-Tests Results for Attitudes towards Teaching Profession between Male and Female Teachers

Dimensions	**Gender**	**M**	***t***	***df***	***p***	**Mean Differences**	**Result**
Changing Attitude during Teacher Training Period	Male	3.75	-4.742	378	**.000**	-.255	**s***
	Female	4.00					
Professional Pride	Male	3.91	-5.513	257.262	**.000**	-.327	**s***
	Female	4.23					
Professional Expectations	Male	3.80	-3.331	269.554	**.000**	-.215	**s***
	Female	4.01					
ATTITUDE	Male	3.74	-4.392	248.063	**.000**	-.196	**s***
	Female	3.93					

Again, the independent samples *t*-test was used to explore the significant differences in attitudes of student teachers towards their profession based on their training course. Table 12 shows the results of independent samples *t*-test.

Table12: Independent Samples *t*-Tests Results for Student Teachers' Attitudes towards Teaching Profession between Training Courses

Dimensions	**Course**	**M**	***t***	***df***	***p***	**Mean Differences**	**Result**
Changing Attitude during Teacher Training Period	5101	3.82	-3.109	378	**.002**	-.166	**s***
	5102	3.98					
Professional Pride	5101	4.03	-2.512	378	**.012**	-.143	**s***
	5102	4.17					
Professional Expectations	5101	3.85	-2.277	378	**.023**	-.139	**s***
	5102	3.99					
ATTITUDE	5101	3.81	-2.392	378	**.017**	-.100	**s***
	5102	3.92					

According to this table, attitudes of student teachers from 5101 (Junior) and 5102 (Senior) were significantly different in "Changing Attitude during Teacher Training Period", "Professional Pride", "Professional Expectations" and overall "ATTITUDE**".** In other words**,** mean values for attitudes of student teachers from 5102 were higher than mean values of student teachers from 5101 in those dimensions.

In order to analyze whether there was a significant difference in attitudes of student teachers towards their teaching profession according to their age and subject of study or not, ANOVA was employed to analyze the data. It was also found that there was no significant difference in attitudes of student teachers towards their teaching profession according to their age. However, there were significant differences in attitudes of student teachers towards their teaching profession according to their subject of study. It can be seen in Table 13.

When analyzing the results from Table 13, it was found that the student teachers' attitudes varied in three dimensions, "Professional or Career Choice", "Commitment towards Teaching Profession", "Professional Pride" and overall "ATTITUDE" according to their subject of study.

Table 13: ANOVA Results for Student Teachers' Attitudes towards Teaching Profession among Subject of Study

Variable		Sum of Squares	*df*	*Mean Square*	*F*	*p*	Result
Professional or Career Choice	Between Groups	5.056	3	1.685	4.738	.003	s*
	Within Groups	133.772	376	.356			
	Total	**138.829**	**379**				
Commitment towards Teaching Profession	Between Groups	3.189	3	1.063	4.403	**.005**	s*
	Within Groups	90.777	376	.241			
	Total	**93.966**	**379**				
Professional Pride	Between Groups	3.463	3	1.154	3.807	**.010**	s*
	Within Groups	114.026	376	.303			
	Total	**117.489**	**379**				
ATTITUDE	Between Groups	2.259	3	.753	4.642	**.003**	s*
	Within Groups	61.003	376	.162			
	Total	**63.262**	**379**				

In order to find out which particular groups had the greatest differences, Post Hoc Multiple Comparison Test (Turkey HSD) was conducted. The results were shown in Table 14.

Table 14: Results of Multiple Comparisons for Student Teachers' Attitudes towards Teaching Profession among Subject of Study

Dimension	**(I) Subject**	**(J) Subject**	**Mean Difference (I-J)**	**Std. Error**	**Sig.**	**95% Confidence Interval**	
						Lower Bound	**Upper Bound**
Professional or Career Choice	Art	NR	.015	.130	.999	-.32	.35
		Science	.207*	.070	**.017**	.03	.39
		A & S	.416*	.145	**.023**	.04	.79
Commitment towards Teaching Profession	Art	NR	-.007	.107	1.000	-.28	.27
		Science	.184*	.057	**.008**	.04	.33
		A & S	.243	.120	.179	.07	.55
Professional Pride	Art	NR	.243	.120	.181	-.07	.55
		Science	.210*	.064	**.007**	.04	.38
		A & S	.156	.134	.649	-.19	.50
ATTITUDE	Art	NR	.104	.088	.638	-.12	.33
		Science	.173*	.047	**.002**	.05	.29
		A & S	.179	.098	.264	-.07	.43

According to the research findings, there were different attitudes in "Professional or Career Choice", "Commitment towards Teaching Profession", "Professional Pride" and overall "ATTITUDE" between student teachers who took art subjects and science subjects. In addition, there was also different attitude between student teachers who took art subjects and art and science subjects concerning the dimension of "Professional or Career Choice".

Conclusions and Discussion

In this research, the self-efficacy beliefs levels and the attitudes towards teaching profession of student teachers studying at BEd teacher training undergraduate program, were investigated. In terms of self-efficacy beliefs levels, all student teachers had the high levels of self-efficacy beliefs in "Instructional Strategies", "Classroom Management" and "Students Engagement". However, it was found that female student teachers had mode rate level of self-efficacy beliefs in "Classroom Management" but there was no significant difference in the perceptions of male and female student teachers about their self-efficacy beliefs.

Similarly, self-efficacy beliefs of student teachers from 5101 and 5102 training courses were not different but there were different perceptions between student teachers from 20-21 age group and student teachers from "24-25" age group concerning the dimensions of "Classroom Management" and overall "Self-Efficacy". In other words, student teachers from"24-25" age group had higher self-efficacy beliefs than student teachers from "20-21" age group. Again, there was no significant difference in self-efficacy beliefs of student teachers based on their subject of study.

On the other hand, student teachers' attitudes towards teaching profession were examined by using five dimensions such as "Professional or Career Choice", "Changing Attitude during Teacher Training Period", "Commitment towards Teaching Profession", "Professional Pride" and "Professional Expectations". Based on the findings, all student teachers had good attitude levels in all five dimensions.

When investigating the attitudes of student teachers towards their profession based on their gender and training course, significant differences were found in the student teachers' perceptions of "Changing Attitude during

Teacher Training Period", "Professional Pride", "Professional Expectations" and overall "ATTITUDE**"**. In other words, female student teachers orstudent teachers from 5102 had changes in their attitudes towards teaching profession during training period, took more pride and expectations for their profession than others' student teachers.

Again, it was found that the student teachers' attitudes varied in three dimensions, "Professional or Career Choice", "Commitment towards Teaching Profession", "Professional Pride" and overall "ATTITUDE" according to their subject of study but their attitudes did not vary according to their age groups. Specifically, there were different attitudes in "Professional or Career Choice", "Commitment towards Teaching Profession", "Professional Pride" and overall "ATTITUDE" between student teachers who took art subjects and science subjects. In this research it was found that 5102 student teachers had higher levels of self-efficacy beliefs and positive attitudes, when compared to the 5101 students because they had taken all their program in 5 years education.

The importance of the education delivered to the student teachers during their undergraduate education process is very crucial. Particularly, the vocational courses related to teaching and pedagogical courses have a great importance on their learning process of being a teacher. These kinds of courses could form the base of teaching (Uyanık, 2016). Therefore, student teachers should be activated in the courses related to their profession. The courses, which are by the active involvement of the students, will be particularly beneficial to them in developing a higher self-efficacy level in teaching. This situation might contribute to the student teachers in having a more positive attitude of being a teacher, by experiencing teaching in their practice courses.

In conclusion, student teachers, who have a more positive attitude, will be effective in training the new generation in a better way. On this context, the academicians of the educational faculties have a crucial responsibility. The learner centered/experience based courses should be given to the student teachers. Two way communications should be provided, and the opinions of the undergraduate students are to be considered. So, it can be claimed that the student teachers, who have increased their levels of self-efficacy beliefs in their teaching, have also managed to have more positive attitudes of becoming a teacher. In addition, teacher training programs should equip student teachers with the knowledge, skills, abilities, and attitudes necessary for them to become better teachers, and give priority to the development of these attitudes.

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THE RELATIONSHIP BETWEEN TEACHER TRANSFORMATIONAL LEADERSHIP AND STUDENT MOTIVATION AT EDUCATION COLLEGES IN SAGAING REGION

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Abstract

The main purpose of this study was to explore the relationship between teacher transformational leadership and student motivation at Education Colleges in Sagaing Region. In this paper, qualitative and quantitative research designs were used. Some students from Sagaing Education College and Monwya Education College participated in this study. They were selected by using simple random sampling technique. Two research instruments were employed to collect the required data. They are Multifactor Leadership Questionnaire (MLQ-5x Short) by Bass and Avolio (1995) to measure teacher transformational leadership and Academic Intrinsic and Extrinsic Motivation Questionnaire (AIEMQ) by Regina (2008) to measure student motivation. There are five dimensions for transformational leadership: idealized influence (attributed), idealized influence (behaviour), intellectual simulation, inspirational motivation and individualized consideration, and two dimensions for motivation: intrinsic and extrinsic motivation. The findings of the study indicated that the second year college students from Education Colleges in Sagaing Region asserted that the teachers often practiced all dimensions of transformational leadership to lead their students and the student motivation fell into the range of high level. In this study, correlational analysis showed that it was a positive significant relationship between teacher transformational leadership and student motivation (r=.670, p<.01). Through the research results, teachers will be able to gain some valuable ideas about the transformation all eadership that can help to promote the student motivation in everyday classroom practices.

Keywords: transformation, leadership, transformational leadership, motivation

Introduction

Education is crucial to building a superior nation and determining its citizens' ability to compete globally. It is a major contributor to social capital development and the economy of the country. As such, education sector requires continuous monitoring to identify areas for improvement.

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In order to improve students' academic performance, teachers need to motivate their students to become to learn more effectively. To raise the standards of school system, the leader and his/her leadership style are essential. The classroom is an organization which aims for learning and sharing interdependent relationship, thus the teacher's role as the leader is clear. Therefore, the teacher role is also one major part in improving education because teachers help others to acquire knowledge, skill, attitude, competences or values.

Teacher leadership is neglected in both the instructional and the leadership communicational fields; however, its utility seems to be hinted at in a few studies. The concept of the teacher as classroom leader is logical and apparent. Moreover, the transformational leadership model can be applied to the instructional context. Transformational leadership may also be considered a key factor in directing all organizational components towards effective accomplishment of organizational goals (Burns, 1978, cited in Noland, 2005) and it needs to provide interaction between all members of the organization. A classroom organization cannot be successful without skilful leadership, without initiation of students' activity and without encouraging students' high motivation and engagement. Teachers can strengthen the motivation of students to do well.

Motivation is an important element in improving work productivity, every education administrator and leader need to have a firm understanding of how it related to job satisfaction and reward systems. Understanding motivation can be key element to improving educational productivity. Since there is a strong relationship between teacher transformational leadership and student motivation, it is important for teachers and students to realize the transformational leadership of teachers in the classroom and student motivation increases and students satisfy teaching with their teachers and then lead to become successful school system.

Purpose of the Study

The main purpose of this study is to investigate the relationship between teacher transformational leadership and student motivation perceived by second year students at Education Colleges in Sagaing Region. Specific objectives of this study are as follows:

1. To examine teacher transformational leadership according to the perceptions of students.
2. To find out student motivation in a classroom setting.
3. To explore the relationship between teacher transformational leadership and student motivation perceived by students at Education Colleges in Sagaing Region.

Research Questions

- What are the students' perceptions of their teachers transformational leadership at Education Colleges in Sagaing Region?
- What are the students' perceptions of their motivation in a classroom setting at Education Colleges in Sagaing Region?
- Is there any relationship between teachers transformational leadership and student motivation at Education Colleges in Sagaing Region?

Related Literature

Bass and Avolio (1994) developed the Full Range Leadership Theory (FRLT) integrating nine leadership factors taken from the transformational and transactional style, to enhance the effectiveness of leaders (cited in Thomson, 2007). Dr. Bruce Avolio is one of the foremost authors on the subject of transformational leadership. Avolio conveys the true essence of transformational leadership by discussing the interrelationship of transformational leadership within transactional leadership. Dr. Avolio identifies three major components of Full Range Leadership: Transformational Leadership, Transactional Leadership, and Non-Transactional (Laissez-faire) Leadership (Shinseki, 1999, cited in Thomson, 2007).Transformational leadership consists of four components:

(1) Idealized Influence: Bass (1999) claims that charisma, or what he termed idealized influence, was the first factor of transformational leaders. Essentially, transformational leaders act as role models. Their personal lives exhibit desirable qualities. Furthermore, their high standards of moral and ethical conduct make them attractive to the public (cited in Hurd, 2012). According to this dimension people feel that their leaders is an ideal person for them so they want to obey, follow and accept his directions to perform and achieve their targets. This dimension makes leaders a hero in the eyes of their workers/followers. Their followers tend to admire, respect and trust them. These leaders inculcate in their followers energy, sense of responsibility and a sense of fulfillment. They achieve these targets through developing a sense of devotion in their followers for their organization (Bukhari & Malik, 2014). Idealized influence or charisma has been divided into two subtypes. They are idealized influence (attributed) and idealized influence (behaviours).

- **Idealized Influence (Attributed)**: Idealized influence (attributed), which refers to the socialized charisma of the managers, whereby the employees feel trust, admiration, loyalty, and respect for the managers (Bass, 1998, cited in Al-Araimi, 2012).
- **Idealized Influence (Behaviours)**: Idealized influence (behaviours), which refers to charismatic actions of the managers that are centred on values, beliefs, and a sense of mission (Bass, 1998, cited in Al-Araimi, 2012).

(2) Inspirational Motivation: Inspirational motivation, which refers to the ways managers energize, motivate, and inspire employees by articulating an appealing vision, providing meaning for focusing employees' effort, modeling appropriate behaviours, and communication to employees that the vision is achievable (Bass, 1998, cited in Al-Araimi, 2012). According to Hurd (2012), transformational leaders set high goals, evidenced through using symbols and emotional appeals to assist in garnering support from followers. The leadership heightens the motivation of the followers/employee. Nothouse (2007) provided an example of a sales manager who motivates his or her sales force to excel in their work through encouraging works (cited in Hurd, 2012).

According to Bass (1999), the leader provides meaning and challenge that motivates and inspires the followers' work. In this case, the leader promotes team spirit, enthusiasm, and optimism in their followers. The leader involves them in a positive vision of the future and communicated high expectations that followers want to achieve. The leader thought this dimension increased followers' awareness and encourages them for achieving constructive expectations (cited in Bukhari & Malik, 2015).

(3) Intellectual Stimulation: Intellectual stimulation essentially involves the leader stimulating the followers to think through issues and problems for themselves and thus to develop their own abilities (Kirkbirde, 2006). Intellectual stimulation, which refers to the ways in which managers question the status quo, appeal to employees' intellect, stimulate them to question their assumptions, and innovative and creative solutions to problems (Bass, 1998, cited in Al-Araimi, 2012).

Although intellectual stimulation is inspiring to subordinates, and is often associated with charismatic leadership, there are some important distinctions between the two. Intellectual stimulation contributes to the independence of followers as opposed to the unquestioning trust frequently directed from followers towards charismatic leaders (Graham, 1987, cited in Levine, 2000). Moreover, through intellectual stimulation, transformational leaders help followers view problems in new ways. They encourage followers to question their own beliefs, assumptions, and values, and, when appropriate, those of the leader, which may be outdated or inappropriate for solving current problems (Bass and Avolio, 1999, as cited in Thomson, 2007).

(4) Individualized Consideration: According to Bass &Riggio (2006), individualized consideration shows leaders' concerns for their followers and the need for them to feel important. Leaders "pay special attention to each follower's needs for achievement and growth by acting a coach or mentor" (cited in Hurd, 2012, p.39). According to Yukl (1999), the individualized consideration dimension is composed of supporting and developing behaviours. "Supporting behaviours" refer to such interpersonal acts as "being friendly, helpful, considerate, and appreciative of individual subordinates", while "developing behaviours" refers to actions of a more pedagogical, such as coaching and mentoring (cited in St-Hilarie, 2008).

According to Bass and Avolio (1997), the construct of individualized consideration explains the leaders' behaviour in focusing on the growth and development of each follower, providing them with new opportunities to learn, and giving them personalized attention (cited in Antonakis, 2001). Further, individualized consideration, which refers to managers' behaviours that contribute to employees' satisfaction by advising, supporting, encouraging, coaching, and paying attention to individual needs and wants, and thus allowing them to develop their self-actualization (Bass, 1998, cited in Al-Araimi, 2012).

In this study, the above components of transformational leadership: idealized influence (attributed), idealized influence (behaviours), inspirational motivation, intellectual stimulation and individualized consideration will be emphasized.

Two Types of Motivation

In this study, the researcher uses only two types of motivation, namely intrinsic motivation and extrinsic motivation.

Intrinsic motivation

Intrinsic motivation is defined as the doing of an activity for its inherent satisfaction rather than for some separable consequence. When intrinsically motivated, a person is moved to act for the fun of challenge entailed rather than because of external prods, pressures, or rewards. The phenomenon of intrinsic motivation was first acknowledged within experimental studies of animal behaviour, where it was discovered that many organisms engage in exploratory, playful, and curiosity-driven behaviours even in the absence of reinforcement or reward. According to Ryan and LaGuardia, in humans, intrinsic motivation is not the only form of motivation, or even of volitional activity, but it is a pervasive and important one. From birth onward, humans, in their healthiest states, are active, inquisitive, curious, and playful creatures, displaying a ubiquitous readiness to learn and explore, and they do not require extraneous incentives to do so (cited in Ryan & Deci, 2000).

Shia (2008) defines intrinsic motivation as;

- Participation in an activity purely out of curiosity or a need to know
- The desire to engage in an activity purely for the sake of participating and completing a task; and
- The desire to contribute

Intrinsic motivation usually refers to the affective aspects of motivation-liking for or enjoyment of an activity. Intrinsic motivation, even for academic activities, does not necessarily imply motivation to learn (Brophy, 1987). Intrinsic motivation requires much persistence and effort put forth by an individual student. Students with intrinsic motivation would develop goals such as, the goal to learn and the goal to achieve. A mastery goal, the desire to gain understanding of a topic, has been found to correlate with effective learning strategies, positive attitudes toward school, the choice of difficult tasks opposed to a simple task, perceived ability, effort, concern of future consequences, self-regulation, the use of deep cognitive processes, persistence, achievement, choice and initiative (Archer, 1994; Miller, Greene, Montalvo, Ravindran, & Nichols, 1996; Garcia & Pintrich, 1996, cited in Shia, 2008).

Extrinsic Motivation

Extrinsic motivation is a construct that pertains whenever an activity is done in order to attain some separable outcome. Manipulation of extrinsic motivation is effected by the provision of rewards, which can be either tangible (e.g., money, grades, privileges, etc) or intangible (e.g., praise). However, extrinsic motivation can come about by other means. Extrinsic motivation is something to do with external factors associated with the task such as assessment. External factors can also be related to instructional strategies, learning conditions, educational technologies and other elements in activity systems (Lai, 2011).

Shia (2008) notes researchers have studied factors such as family expectations, teacher expectations, money, and peer acceptance, which are extrinsic factors that interact with motivation, all of which “involve proving one’s competence to another”. Moreover, Shia (2008) also stated that extrinsic motivation refers to motives that are outside of and separate from the behaviour they cause; the motive for the behaviour is not inherent in or essential to the behaviour itself. If a student studies hard to do well on a test because a good grade will result in a brand new car, then the motive behind studying is not what it is intended to obtain knowledge. Studying information is a prerequisite to learning; however, it is often manipulated to lead toward other things such as money, acceptance, or power.

Method and Procedure

The purpose of this descriptive study was to explore the relationship between teacher transformational leadership and student motivation on at Education Colleges in Sagaing Region. There are two Education Colleges in Sagaing Region. All second year students at Education Colleges in Sagaing Region were chosen as participants in the study. The sample population consisted of 622 second year college students. The questionnaire survey method was used in this study to achieve the research objectives, which involved using questionnaires to gather data within a representative sample of a population.

"The Multifactor Leadership Questionnaire" is the most frequently used survey when researching transformational leadership. There were 20 items (five dimensions) utilized in this current study. In this instrument, 5-point Likert scale; 1=strongly disagree, 2=disagree, 3=undecided, 4=agree, 5=strongly agree was used. Moreover, Shia (2008) developed academic intrinsic and extrinsic motivation factors to measure the motivation of college students. To conduct the major study, it needed to have the permission from the responsible persons. After receiving the permission from the responsible persons, the agreement of school principals of the sample schools was takenand distributed the questionnaire.

Using the Statistical Package for Social Sciences (SPSS) software version 20, the collected data were entered into it and analyzed through using descriptive statistics such as means, and standard deviations to test research question one and two. To explore research question three, the relationship between teacher transformational leadership and student motivation, Pearson's product-moment correlation was used. Responses from open-ended questions were categorized into similar views that are adopted to sort out them.

Findings

In order to find out the transformational leadership of teachers and the student motivation perceived by students at two Education Colleges in Sagaing Region, all second year college students were examined by using questionnaires. The data collected were analyzed in terms of mean scores, standard deviations, Independent Sample ***t***-test, and Pearson product-moment correlation.

In this study, it consists of two parts. First, means and standard deviations for teacher transformational leadership and student motivation of two Education Colleges were explored. Moreover, means and standard deviations for gender and specialized subject were calculated by Independent Sample ***t***-test. Second, the relationship between teacher transformational leadership and student motivation was examined by using Pearson's product-moment correlation coefficient.

Table 1: Mean Scores and Standard Deviation of Teacher Transformational Leadership at two Education Colleges inSagaing Region (N=622)

Dimensions of Transformational Leadership	Colleges	N	Mean	SD	Total Mean (A & B)	Remark
Idealized Influence (Attributed)	A B	267 355	3.88 3.96	0.525 0.483	**3.93**	Often Often
Idealized Influence (Behaviours)	A B	267 355	4.13 4.17	0.45 0.459	**4.15**	Often Often
Inspirational Motivation	A B	267 355	4 4.09	0.476 0.466	**4.05**	Often Often
Intellectual Stimulation	A B	267 355	3.94 4.01	0.579 0.567	**3.98**	Often Often
Individualized Consideration	A B	267 355	3.82 3.93	0.601 0.567	**3.89**	Often Often
Transformational Leadership	**A** **B**	**622**	**3.96** **4.03**	**0.424** **0.400**	**4**	**Often**

1.00 to 1.49 = Never, 1.50 to 2.49 = Seldom, 2.50 to 3.49 = Sometimes,
3.50 to 4.49 = Often, 4.50 to 5.00= Always

Table 1 indicates that the teacher transformational leadership domains for the two Education Colleges based on the perceptions of students from those schools. It was found that the domains of teacher transformational leadership: "Idealized Influence (Behaviours)" ($\overline{X}$= 4.15) had the highest mean, followed, in descending order, by "Inspirational Motivation" ($\overline{X}$= 4.05), "Intellectual Stimulation" ($\overline{X}$= 3.98), "Idealized Influence (Attributed)" ($\overline{X}$= 3.93) and "Individualized Consideration" ($\overline{X}$= 3.89).

The total mean value for students' perceptions on their teachers' transformational leadership was 4. Therefore, according to the results of the Table 1, it can be concluded that teachers from the two Education Colleges of Sagaing Region often exercised all dimensions of transformational leadership.

Table 2: Independent Sample *t*-Test Results for Teacher Transformational Leadership at Two Education Colleges in Sagaing Region by Gender (N=622)

	Gender	**No. of Students**	**Mean**	**SD**	***t***	***df***	***P***
Transformational Leadership	Male	323	3.91	0.425	-5.895	720	.000***
	Female	299	4.10	0.374	-5.895	720	.000***

Note: ***p < .001

According to the results of Table 2, the result of *t*-test shows significance different in gender of participants: male and female. The total mean value of male students is ($\overline{X}$= 3.91). Again, the total mean value of female students is ($\overline{X}$= 4.10). Then, the mean score of female students was higher than the male students. Therefore, it can be concluded that the female students better perceived their teachers use transformational leadership than male students did.

Table 3: Independent Sample *t*-Test Results for Teacher Transformational Leadership at Two Education Colleges in Sagaing Region by Subject (N=622)

	Specialized Subject	**No. of Students**	**Mean**	**SD**	***t***	***df***	***p***
Transformational Leadership	Science	413	4.00	0.412	-0.49	614	.624 (ns)
	Art	209	4.01	0.414	-0.49	614	.624 (ns)

Note: ns=no significant

According to the results of the Table 3, the result of *t*-test shows there was no significant difference between the perceptions of Science students and Art student on their teachers' transformational leadership. Therefore, it can be interpreted that Science students and Art students similarly perceived their teachers' transformational leadership style in the classroom.

Again, the instrument, Academic Intrinsic and Extrinsic Motivation developed by Regina M. Shia (2008), was used to find out the students' perceptions on their motivation in a classroom setting at two Education Colleges in Sagaing Region. The mean scores were calculated under two factors of student motivation scale: "Intrinsic Motivation" and "Extrinsic Motivation".

Table 4: Mean Scores and Standard Deviations of Two Clusters of Student Motivation at Education Colleges (N=622)

Dimensions of Student Motivation	**Colleges**	**N**	**Mean**	**SD**	**Total Mean (A & B)**	**Remark**
Intrinsic Motivation	A B	267 353	3.95 4.04	0.504 0.452	**4.04**	High High
Extrinsic Motivation	A B	267 353	3.89 3.93	0.414 0.424	**4.00**	High High
Student Motivation	**A** **B**	267 353	**3.92** **3.99**	**0.426** **0.406**	**3.96**	**High**

1.00 to 1.49 = very low level, 1.50 to 2.49 = low level, 2.50 to 3.49 = moderate level,
3.50 to 4.49 = high level, 4.50 to 5.00= very high level

Table 4 depicts that the dimensions of student motivation perceived by teachers for the two Education Colleges in Sagaing Region. It was found that "Intrinsic Motivation" ($\bar{X}$=4.04) had the highest mean, followed in descending order, by "Extrinsic Motivation" ($\bar{X}$=4.00). The total mean value for student motivation at the two Education Colleges in Sagaing Region was high. Therefore, it implied that student motivation at the two Education Colleges in Sagaing Region was high.

Table 5: Independent Sample *t*-Test Results for Two Clusters of Student Motivation at Two Education Colleges in Sagaing Region by Gender (N=622)

Student Motivation	Gender	No. of Students	Mean	SD	*t*	*df*	*p*
Intrinsic Motivation	Male Female	323 299	3.89 4.13	.506 .409	-6.501	6189	.000***
Extrinsic Motivation	Male Female	323 299	3.82 4.01	.451 .360	-5.643	619	.000***

Note: ***p<.001

According to Table 5, the result of *t*-test shows significant difference in gender of participants: male and female. Therefore, it can be concluded that female students had better intrinsic motivation and extrinsic motivation than male students.

Table 6: Independent Sample *t*-Test Results for Two Clusters of Student Motivation at Two Education Colleges inSagaing Region by Subject (N=622)

Dimensions of Student Motivation	Specialized Subject	No. of Students	Mean	SD	*t*	*df*	*p*
Intrinsic Motivation	Science Art	413 209	3.99 4.02	.476 .481	-.679	618	.498(ns)
Extrinsic Motivation	Science Art	413 209	3.9 3.94	.401 .451	-1.244	618	.214(ns)

Note: ns=no significant

According to the results of the Table 5, the result of *t*-test shows no significant difference in intrinsic motivation and extrinsic motivation by specialized subject. Thus, it can be concluded that Art students and Science students expressed same motivation.

Table 7: Correlation between Teacher Transformational Leadership and Student Motivation at Two Education Colleges in Sagaing Region

Dimensions		IIA	IIB	IM	IS	IC	TL
Intrinsic Motivation	Pearson Correlation	.522**	.493**	.524**	.553**	.541**	.666**
	Sig (2-tailed)	.000	.000	.000	.000	.000	.000
Extrinsic Motivation	Pearson Correlation	.473**	.383**	.479**	.496**	.456**	.571**
	Sig (2-tailed)	.000	.000	.000	.000	.000	.000
Student Motivation	Pearson Correlation	.539**	.477**	.540**	.568**	.541**	.670**
	Sig (2-tailed)	.000	.000	.000	.000	.000	.000

Note: ** Correlation is significant at the 0.01 level (2-tailed).

TL =Transformational Leadership **IM** = Inspirational Motivation
IIA = Idealized Influence (Attributed) **IS** = Intellectual Stimulation
IIB = Idealized Influence (Behaviours) **IC**= Individualized Consideration

The overall measure of teacher transformational leadership and student motivation perceived by students were positively correlated with a Pearson r=.670 at .01 level. Then the effect size was computed for a full interpretation of correlation according to Cohen (1998, cited in Morgan et al., 2004). The effect size of *r*=.670 was considered large effect size. The two clusters of student motivation correlated significantly with the transformational leadership (TL) scores. The two clusters were intrinsic motivation (*r*=.666, large effect size) and extrinsic motivation (*r*=.571, large effect size).

Besides, quantitative items, the researcher asked two open-ended questions. The first open-ended question asked the students to describe the transformational leadership which should be practiced by the teachers for the success of their students' learning and the success of students. Most of the participants responded that transformational leadership should be practiced by the teachers in order to perform school activities and student learning activities successfully and also they requested to the teacher as follows. The teacher should

- give the students great advices, suggestions and guidance.
- point out the strengths and weaknesses of students and training the students to behave good practices.

- have high morale and professional ethics.
- collaborate and cooperate with students in all school activities.
- have caring, warming and helping the individual student.

The second questions asked the students to describe how teachers motivate their students. Most of the participants responded that motivation should be perceived by the students in order to perform theschool activities and student learning activities and also they answered as follows. The teacher motivated the students by

- feeling happy to do classroom activities.
- setting high expectations.
- gaining good opportunities for the development of the life.
- sharing and collaborating the classroom activities with the classroom students.
- trying hard to pass the BEd entrance.

According to the results of the open-ended questions, the teachers using the transformational leadership can increase and promote the student motivation.

Discussion

Nowadays, everything is changing and people want to change to grasp the success. No one can deny that every organisation needs leader who change their organization. So, leadership is necessary for the success of the organization. In the changing world, transformational leadership is needed. Student motivation: "Intrinsic Motivation" and "Extrinsic Motivation" can increase with teacher transformational leadership. According to the transformative theory, it included that the leader (teacher) motivates their followers (students) by using transformational leadership. Transformational leaders (teachers) uplift the motivation of their followers (students). Teachers provide different ways for students to reach their goals and to meet their expectations. Good leaders can motivate their followers' motivation and followers want to try to reach and meet their goals. Students' beliefs can affect their motivation. The goal of every school is to transform its students by providing knowledge and skills and by building character and instilling virtue (Serogiovanni, 1991, cited in Brennen, n.d.). Student motivation is heavily influenced by their thinking about what they perceive as important and what they believe they can accomplish (McMillan & Forsyth, 1991). One of the teachers' responsibilities is to create the conditions that will enhance students' motivation to pursue academic goals actively over a long period of time. Thus, students get both "Intrinsic Motivation" and "Extrinsic Motivation" by their teachers' transformational leadership. They try the best to get good grades and also interested in the classroom activities. They share the lessons with other students and are happy to participate in group activities. They also try to go to University of Education and to learn to become good teachers in the future. So, by better understanding this relationship, we can concentrate on improving and increasing student motivation with teacher transformational leadership.

Therefore, according to the findings of this study, teachers who use and practice all dimensions of transformational leadership: "Idealized Influence (Attributed)", "Idealized Influence (Behaviours)", "Inspirational Motivation", "Intellectual Stimulation" and "Individualized Consideration" help students to increase student motivation to learn. So, by better understanding this relationship, we can concentrate on improving student motivation by using transformational leadership.

Conclusion

Transformational leadership and instructional communication are two major and convergent ideas. The instructional field is always searching for novel ways to transmit information, engage students, empower learners, increase motivation, and improve learning. A transformational approach to teacher leadership can provide the necessary tools to achieve these broad goals. The transformational leadership model is an appropriate and effective model for classroom instruction. And therefore, transformational leadership can also increase student motivation.

This study sought to examine the relationship between teacher transformational leadership and student motivation at Education Colleges in Sagaing Region. When studying the perceptions of students about teacher transformational leadership, it was found that the teachers of two Education Colleges (College A and College B) in Sagaing Region often practiced all dimensions of transformational leadership. This means that teachers in these schools have the ability to stimulate students to try better, to inspire a different outlook on the school activities, to meet the needs of students, to elicit alignment between leader-follower (teacher-student) values, beliefs and sense of mission and to take time both before and after class to interact with the students. Whe cited in Thomson, 2007n studying student motivation, all clusters of student motivation: "Intrinsic Motivation" and "Extrinsic Motivation" of students at two Education Colleges in Sagaing Region (College A and College B) were in the range of high level.

This means that students in these colleges have the ability to gain valuable knowledge from College, do the best on every assignment, try to learn from the mistakes, get learning experiences, feel like challenging assignments, have high expectations for themselves, gain valuable knowledge from the other sources (e.g., internet), set high goals for themselves, be happy about various subjects and poems, work hard in a group activities, like a difficult project, believe themselves as they can do, become well-informed in academic areas, want to learn everything, like to spend reading themselves, complete assignments regularly, try to live up the way that the teacher expects, demonstrate the abilities in the classroom, get suggestions from the teachers, get the opportunities to face the future, prefer difficult tasks, feel ashamed when fail, try the best to achieve good grade. And as students learn more they become more motivated. Motivating students is transformational (Richmond, 1990, cited in Noland, 2005).

Besides, the relationship between students' perception of teacher transformational leadership and student motivation at Education Colleges in Sagaing Region was examined. According to the findings, transformational leadership of teachers was significantly related to student motivation. The overall measure of teacher transformational leadership and student motivation as perceived by students were positively correlated with a Pearson r=.670 at .01 level. These findings were in congruence with the submissions of Noland (2005), Noland and Richards (2014) found that teacher transformational leadership is positively correlated with student motivation. Therefore, it can be concluded that the more the teachers use and practice transformational leadership, the more the students increase motivation.

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EXPLORING THE TYPES AND CAUSES OF STUDENTS' DISCIPLINARY PROBLEMS AT SELECTED BASIC EDUCATION HIGH SCHOOLS IN SAGAING

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Abstract

This study investigated the types and causes of students' disciplinary problems at selected Basic Education High Schools in Sagaing. Some teachers and students from these selected schools were chosen as participants for this study by using simple random sampling technique. This study was conducted by using mixed method which included qualitative and quantitative methods. As research instrument, Students' Disciplinary Problems Questionnaire (SDPQ) developed by Erena. T.M (2015) was used to gather the required data. There are seven dimensions in this questionnaire: parents related factors, teacher related factors, school and school administrators related factors, curriculum related factors, learner related factors, gender related factors and finally role played by school management. Based on this questionnaire, two questionnaires were constructed (one for principals/teachers and another for students). According to the research findings, an interview study was conducted as a follow up study. The results obtained from the study reveal that major types of students' disciplinary problems are mainly caused by learner related factor. It is hoped that this study will be able to give the principals and teachers some ideas about the students' disciplinary problems and by using these ideas, the most appropriate ways will be able to be used to solve the students' problems.

Keywords: discipline, disciplinary problem, intervention

Introduction

Education is major pillar for the development of any nation. Education shapes the behaviour of students towards socially acceptable manners. It guides the brightening future of the students. The essential agents who transmit education to students are teachers. Teachers are role models of students. They transmit cultural heritage, traditional ideology and social norms of the organization. Thus teachers can be identified as the essential persons in any organization. The major responsibility of the teachers accompanies with educating students. The interventions that interfere the

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success of teaching learning process are disciplinary problems. Discipline problems happened when the students disobeyed the school rules and regulation and challenge the teachers' authority.

Although disciplinary problems were supposed as minor cases, this can disturb the success of entire teaching learning process. If the physician knows the disease of the patient, he can cure the disease. Also, if the teachers know the behavioral problems of the students and possible causes that contribute to these problems, they can handle these problems and can guide students to become effective learning. When the teachers find the cause of disciplinary problems, they should not miss the background situation of the disciplinary problems. There is a saying that, prevention is better than cure. Like that, if the teachers know the influencing factors that cause disciplinary problems of the students, they can prevent these problems not to happen in the future.

Many schools and communities across the nation are working to construct effective discipline practices (Nelson, 2002).Effective learning cannot be achieved in learning environment if students have disciplinary problems. The principals and teachers need to cooperate to solve disciplinary problems of students and they need to find the influencing factors that cause the disciplinary problems. If we know the causes of disciplinary problems, we can find the ways how behavior problems can be prevented in the future. So, discipline is one of the most important problems of education. For solving disciplinary problems, it should not be the responsibility of the individual school alone. This is work of parents, work of communities and work of the nation. Therefore, it is hoped that this study will be able to highlight the types and causes of students' disciplinary problems and how to prevent students' disciplinary problems.

Purpose of the Study

The purpose of this study is to investigate the types of disciplinary problems and their causes at selected Basic Education High Schools in Sagaing.

The specific objectives of this study are as follows:

1. to examine the major types of students' disciplinary problems

2. to find out the major factors that cause students' disciplinary problems
3. to explore how administrators and teachers address students disciplinary problems

Research Questions

- What are the major types of students' disciplinary problems?
- What are the major factors that cause students' disciplinary problems?
- How do administrators and teachers address students' disciplinary problems?

Review of Related Literature

Factors Responsible for Disciplinary Problems

Parent or Family Related Factors. The most important factor that influences the students' attitude and social behaviour is parental control at home. Parents are the main persons who cultivate morality of their children.

Bowman (2004) viewed that parents' failure to teach their children discipline is identified as the greatest contributing factor to disciplinary problems in schools. In addition, different causes of students' disciplinary problem that are low income, large family size, lack of offering love to children, little value to education, frequent conflicts and divorce of parents and death of family members.

Teacher Related Factors. The teachers can be a potent factor in causing disciplinary problems. The teachers' personality has bearing upon the learners which stem from two aspects-the teachers' personal characteristics and his scholastic qualifications. The physical characteristics include the teacher's personal appearance, poise, health, mannerisms, habits of neatness and cleanliness and well-modulated voice. Teachers' scholastic qualifications (academic preparation and training, mastery of the subject matter, command and facility of language, cultural background and experience) can cause disciplinary problems (Levy Dalumpines, 2011).

School and School Administrators Related Factors. Principals must set clearly stated expectations for student behaviour and ensure their consistent enforcement to foster an orderly environment (Bett et al., 2010).Lack of appropriate leadership style of principals may also be problems in managing school.

School community should provide reasonable rules for the good order of the school and the discipline of students. School also has the power to enforce these rules by using discipline or punishment. Therefore, school needs good discipline which is required to ensure that school is able to provide quality education for all students and to guarantee the care and safety of the school community.

Curriculum Related Factors. The relevance of curriculum to learners' need can influence discipline in school. According to Ravan' study (cited in Besag, 1991), learners engage in several forms of deviant behavior if the curriculum is not able to offer them opportunities for self-development and a sense of personal worth, and do not address the needs of the society. Deveton (1991) pointed out that if the content of curriculum is not relevant to learners' interest and the need of current communities, deviant behaviour will be experienced.

Learners Related Factors . Maintaining an orderly learning environment is largely dependent on students who take responsibility for their own behaviour and learn to practice self-discipline (Bett et al., 2010).There are two main areas where the teacher wants to encourage the student to develop self-discipline skills in improving the quality of interpersonal interactions, and in setting personal goals that allow the student to experience success and achievement.

Learners with poor visions, difficulty in hearing, cripple, or hunch back can cause disciplinary problems in their class. Irresponsibility, poor social contact, lack of interest in school activities, habitual truancy, lying, cheating, stealing, vandalism, resistance to school rules and regulations, disrespect or discourtesy and emotional immaturity are common disciplinary problems that are caused by learners (Levy Dalumpines, 2011).

Gender Related Factors. The term gender refers to the economic, social, political and cultural attributes and opportunities, associated with being male and female. In most societies, men and women differ in the activities they undertake, in access to and control of resources, and in participation in decision-making. Gender is one of the related factors that affect disciplinary problems. Gender is only one of the factors that affect achievement in various subject fields.

Role Played by School Management. School management may be a factor in discipline in the sense that administrative policies, regulations and practices are not fully observed and implemented. When school policies, regulations and other institutional practices are not properly observed and followed, the tendency is that students develop undesirable habits and attitudes (Levy Dalumpines, 2011). Good classroom management cannot be separated from students' discipline.

Design and Procedure

The major purpose of the study was to investigate the types and causes of students' disciplinary problems. They were examined by using questionnaires developed by Erena (2015) in which 37 items and 8 open-ended questions were also included. Qualitative research method was also conducted to acquire validated and adequate findings about the types and causes of students' disciplinary problems.

There are 4 Basic Education High Schools and 4 Branch High Schools in Sagaing. Among them, 4 Basic Education High Schools in Sagaing were selected as sample schools. The target population of the study was all principals and teachers, and students at selected Basic Education High Schools in Sagaing. In this study, Grade 8 and Grade 10 students were purposely selected according to their grade, age level and they are mature enough to fill the questionnaires.

Research Method. The study was conducted by using mixed method which included qualitative and quantitative research method as a research design.

Data Analysis. In this study, SPSS (statistical package for social science) version 20 was widely used to calculate data received from selected teachers and students. With the help of SPSS, Descriptive statistics such as mean and standard deviation were calculated. Cross tabulation, frequency count, percentage, mean and weight mean were used to present the collected data.

Findings

The questionnaires were constructed on the biographical data, types of disciplinary problems and why these problems were caused.

Quantitative Responses. In this quantitative study, there were 37 items. These items were constructed with 7 dimensions: parent related factors, teachers related factors, school and school administrators related factors, curriculum related factors, learners related factors, gender related factors and role played by school management. In this study, each item was rated by using the Five Likert Scale.

1. Parents Related Factor

Table 1: Influence of Parent Related Factors on Students' Disciplinary Problems

No.	Items	Respondent	Responses SA	A	UN	DA	SD	M	WM	Remark
				N	N	n	n			
1	Lack of parents follow up activities on students' day to day activities	T	0 (0%)	13 (6.5%)	11 (5.5%)	89 (44.3%)	88 (43.8%)	1.75	2.65	Undecided
		S	97 (20.9%)	183 (39.4%)	97 (20.9%)	59 (12.7%)	28 (6 %)	3.56		
2	Loosing of students' freedom to express their feeling at home	T	42 (20.9%)	146 (72.6%)	6 (3%)	3 (1.5 %)	4 (2 %)	4.09	3.68	Agree
		S	89 (19.2%)	129 (27.8%)	144 (24.6%)	83 (17.9%)	49 (10.6%)	3.27		
3	Low financial background of the family	T	50 (24.9%)	144 (71.6%)	2 (1%)	4 (2%)	1 (0.5%)	4.18	3.37	Undecided
		S	47 (10.1%)	85 (18.3%)	96 (20.7%)	93 (20%)	142 (30.6%)	2.57		
4	Low educational background of the family	T	33 (16.4%)	153 (76.1%)	2 (1%)	13 (6.5%)	0 (0%)	4.02	3.3	Undecided
		S	82 (17.8%)	107 (23.2%)	102 (21.9%)	110 (23.6%)	63 (13.5)	2.92		
5	Divorce or death of families	T	25 (12.4%)	158 (78.6%)	3 (1.5%)	15 (7.5%)	0 (0%)	3.96	3.3	Undecided
		S	53 (11.4%)	72 (15.5%)	132 (28.4%)	89 (19.2%)	118 (25.4%)	2.68		
6	Large family size	T	39 (19.4%)	148 (73.6%)	2 (1%)	8 (4%)	4 (2%)	4.04	3.96	Agree
		S	137 (29.5%)	191 (41.2%)	94 (20.3%)	29 (6.2%)	13 (2.8%)	3. 88		

Note: SA=strongly agree (4.5 to 5.00)A=agree (3.49 to 4.49)UN=undecided (2.49 to 3.49) D =disagree (1.49 to 2.49) SD =strongly disagree (1.00 to 1.49) M=mean WM=weight mean

Table 1 shows mean values for parent related factors perceived by teachers and students. According to Table 1, two items of parent related factors such as; "loosing of students' freedom to express their feeling at home" and "large family size" were observed as causes of students' disciplinary problems based on the teachers' and students' perceptions.

Concerning with the factor "lack of parents follow up activities on students' day to day activities", "low financial background of the family", "low educational background of the family" and "divorce or death of families or one of family members", teachers and students could not decide whether students' disciplinary problems were occurred or not.

2. Teachers Related Factor

Table 2 shows influence of teachers related factors on students' disciplinary problems.

Table 2: Influence of Teachers Related Factors on Students' Disciplinary Problems

No	Items	Respondent	Responses					M	WM	Remark
			SA	A	UN	DA	SD			
			N	N	n	n	N			
1	Absence of consistent corrective measures by teachers	T	32 (15.9%)	136 (67.7%)	9 (4.5 %)	20 (10 %)	4 (2 %)	3.86	3.84	Agree
		S	103 (22.2%)	248 (53.4%)	57 (12.3%)	43 (9.3 %)	13 (2.8 %)	3.83		
2	The absence of role model on the side of teachers	T	12 (6%)	123 (61.2%)	14 (7%)	45 (22.4%)	7 (3.5%)	3.44	3.58	Agree
		S	52 (4.2%)	117 (9.5%)	220 (17.9%)	461 (37.4%)	381 (31.0%)	3.81		
3	Committed teachers have less disciplinary problems	T	26 (12.9%)	147 (23.1%)	9 (4.5%)	14 (7%)	5 (2.5%)	3.87	3.89	Agree
		S	136 (29.3%)	203 (43.8%)	82 (17.7%)	36 (7.8%)	7 (1.5%)	3.92		
4	The absence of good relation between school administrators and teachers	T	24 (11.9%)	145 (22.1%)	13 (6.5%)	13 (6.5%)	6 (3%)	3.84	3.72	Agree
		S	104 (22.4%)	157 (33.8%)	134 (28.9%)	52 (11.2%)	17 (3.7%)	3.6		

Note: SA=strongly agree (4.5 to 5.00)A=agree (3.49 to 4.49) UN=undecided (2.49 to 3.49) D=disagree (1.49 to 2.49) SD=strongly disagree (1.00 to 1.49) M=mean WM=weight mean

According to Table 2, all items of teachers related factors were observed as causes of students' disciplinary problems.

3. School and School Administrators Related Factor

Table 3 shows influence of school and school administrators related factors on students' disciplinary problems.

Table 3: Influence of School and School Administrators Related Factors on Students' Disciplinary Problems

No	Items	Respondent	Responses SA	A	UN	DA	SD	M	WM	Remark
			N	N	n	n	N			
1	The absence of good handling of students' discipline in the school	T	15 (7.5%)	167 (83.1%)	6 (3%)	9 (4.5%)	4 (2%)	3.9	4.04	Agree
		S	174 (37.5%)	220 (47.4%)	54 (11.6%)	12 (2.6%)	4 (0.9%)	4.18		
2	The absence of implementation school laws	T	30 (14.9%)	164 (81.6%)	1 (0.5%)	5 (2.5%)	1 (0.5%)	4.08	3.97	Agree
		S	115 (24.8%)	214 (46.1%)	103 (22.2%)	22 (4.7%)	10 (2.2%)	3.87		
3	Large class size	T	15 (7.5%)	130 (64.7%)	14 (7%)	39 (19.4%)	3 (1.5%)	3.57	3.73	Agree
		S	137 (29.5%)	191 (41.2%)	94 (20.3%)	29 (6.2%)	13 (2.8%)	3.88		
4	Strict school rules encourage students to stay away from school purposely without/permission/ truancy	T	12 (6%)	124 (61.7%)	28 (13.9%)	32 (15.9%)	5 (2.5%)	3.53	3.7	Agree
		S	159 (34.3%)	165 (35.6%)	72 (15.5%)	47 (10.1%)	21 (4.5%)	3.85		
5	Lack of teamwork among educators and educational stakeholders	T	17 (8.5%)	117 (58.2%)	12 (6%)	46 (22.9%)	9 (4.5%)	3.43	3.67	Agree
		S	116 (25%)	244 (52.6%)	66 (14.2%)	22 (4.7%)	16 (3.4%)	3.91		
6	Absence of good educational leadership	T	21 (10.4%)	152 (75.6%)	17 (8.5%)	7 (3.5%)	4 (2%)	3.89	3.87	Agree
		S	127 (27.4%)	200 (43.1%)	90 (19.4%)	34 (7.3%)	13 (2.8%)	3.85		

Note: SA=strongly agree (4.5 to 5.00) A=agree (3.49 to 4.49) UN=undecided (2.49 to 3.49)

D=disagree (1.49 to 2.49) SD=strongly disagree (1.00 to 1.49) M=mean

Table 3 shows mean values for school and school administrator related factors perceived by selected teachers and students. With the items included in Table 3, such as "the absence of good handling of students' disciplinary problems in schools", "the absence of good handling of school rules", "large class size", "strict schools rules encourage students to stay away from school purposively without permission/truancy", "lack of team work among educators and educational stakeholders" and "absence of good educational leadership" are the causes of students' disciplinary problems.

4.Curriculum Related Factors

Table 4 is the influence of curriculum related factors on the types and causes of students' disciplinary problems.

Table 4: Influence of Curriculum Related Factors on Students' Disciplinary Problems

No	Items	Respondent	Responses					M	WM	Remark
			SA	A	UN	DA	SD			
			N	N	n	n	N			
1	The curriculum is unrelated to learners' grade level	T	46 (22.9%)	134 (66.7%)	6 (3%)	10 (5%)	5 (2.5%)	4.02	3.83	Agree
		S	132 (28.4%)	143 (30.8%)	113 (24.4%)	41 (8.8%)	35 (7.5%)	3.64		
2	School curriculum is deficient in moral training	T	24 (11.9%)	160 (79.6%)	6 (3%)	5 (2.5%)	6 (3%)	3.95	3.76	Agree
		S	86 (18.5%)	182 (39.2%)	126 (27.2%)	51 (11%)	19 (4.1%)	3.57		
3	Learners find the curriculum boring	T	20 (10%)	134 (66.7%)	17 (8.5%)	26 (12.9%)	4 (2%)	3.7	3.78	Agree
		S	121 (26.1%)	225 (48.5%)	61 (13.1%)	41 (8.8%)	16 (3.4%)	3.85		
4	The curriculum does not take care of the entire social aspiration	T	36 (17.9%)	154 (76.6%)	2 (1%)	4 (2%)	5 (2.5%)	4. 05	3. 7	Agree
		S	65 (14%)	137 (29.5%)	178 (38.4%)	65 (14%)	19 (4.1%)	3. 35		

Note: SA=strongly agree (4.5 to 5.00) A=agree (3.49 to 4.49) UN=undecided (2.49 to 3.49) D=disagree (1.49 to 2.49) SD=strongly disagree (1.00 to 1.49) M=mean WM=weight mean

Table 4 shows the mean values for curriculum related factors perceived by selected teachers and students. With all items of curriculum related factors: "the curriculum is unrelated to learners' grade level", "school curriculum is deficient in moral training", "learners find the curriculum boring" and "the curriculum does not take great care of the entire social aspiration", both teachers and students agreed that these are the problems that influence on the students' disciplinary problems.

5. Learner Related Factor

After finding the causes of disciplinary problems that related to parents, teachers, curriculum and school and school administrators, the researcher continued learner related factors. The following Table 5 represents the influence of learners' related factors on the types and causes of students' disciplinary problems.

Table 5: Influence of Learners Related Factors on Students' Disciplinary Problems

No	Items	Respondent	Responses					M	WM	Remark
			SA	A	UN	DA	SD			
			N	N	n	n	n			
1	The students disobeyed teachers	T	11 (5.5%)	102 (50.7%)	29 (14.4%)	53 (26.4%)	6 (3%)	3.29	3.82	Agree
		S	224 (48.3%)	202 (43.5%)	19 (4.1%)	10 (2.2%)	9 (1.9%)	4.34		
2	Damaging school property/vandalism	T	18 (9%)	109 (54.2%)	33 (16.4%)	37 (18.4%)	4 (2%)	3.5	3.98	Agree
		S	280 (60.3%)	151 (32.5%)	14 (3%)	10 (2.2%)	9 (1.9%)	4.47		
3	Calling teachers by name	T	11 (5.5%)	161 (80.1%)	9 (4.5%)	16 (8%)	4 (2%)	3.79	4.06	Agree
		S	254 (54.7%)	148 (31.9%)	36 (7.8%)	13 (2.8%)	13 (2.8%)	4.33		
4	Some learners do not have social contact	T	31 (15.4%)	150 (74.6%)	6 (3%)	10 (5%)	4 (2%)	3.97	3.35	Undecided
		S	56 (12.1%)	27 (16.6%)	112 (24.1%)	121 (26.1%)	98 (21.1%)	2.72		
5	Classes with more boys than girls are tough to control	T	6 (3%)	114 (56.7%)	23 (11.4%)	48 (23.9%)	10 (5%)	3.29	3.55	Agree
		S	162 (34.9%)	171 (36.9%)	53 (11.4%)	38 (8.2%)	40 (8.6%)	3.81		

No	Items	Respondent	Responses					M	WM	Remark
			SA	A	UN	DA	SD			
			N	N	n	n	n			
6	Some students involve in stealing delinquencies	T	26 (12.9%)	164 (81.6%)	2 (1%)	9 (4.5%)	0 (0%)	4.03	4.21	Agree
		S	265 (57.1%)	152 (32.8%)	25 (5.4%)	8 (1.7%)	14 (3%)	4.39		
7	Students use cell phones during classes	T	43 (21.4%)	149 (74.1%)	1 (0.5%)	8 (4%)	0 (0%)	4.13	4.23	Agree
		S	267 (57.5%)	126 (27.2%)	42 (9.1%)	13 (2.8%)	16 (3.4%)	4.33		
8	Students fight a lot in school	T	26 (12.9%)	142 (70.6%)	13 (6.5%)	15 (7.5%)	5 (2.5%)	3.84	4.15	Agree
		S	283 (61%)	142 (30.6%)	19 (4.1%)	6 (1.3%)	14 (3%)	4.45		
9	Peer group influence and absence of future plan	T	45 (22.4%)	135 (67.2%)	7 (3.5%)	7 (3.5%)	7 (3.5%)	4.01	3.83	Agree
		S	132 (28.4%)	143 (30.8%)	113 (24.4%)	41 (8.8%)	35 (7.5%)	3.64		
10	Cheating during examination	T	34 (16.9%)	157 (78.1%)	0 (0%)	6 (3%)	4 (2%)	4.05	4.18	Agree
		S	234 (50.4%)	181 (39%)	25 (5.4%)	9 (1.9%)	15 (3.2%)	4.31		

Note: SA=strongly agree (4.5 to 5.00) A=agree (3.49 to 4.49) UN=undecided (2.49 to 3.49) D=disagree (1.49 to 2.49) SD=strongly disagree (1.00 to 1.49) M=mean WM=weight mean

Table 5 shows mean values for learners related factors perceived by selected teachers and students. According to the result, almost all items are types and causes of students' disciplinary problems. The only factor concerning "some learners do not have social contact" could not be decided whether students’ disciplinary problems were occurred or not.

6. Gender Related Factor

Table 6 shows about gender related factors that influence on students' disciplinary problems. There are two items under gender related factors.

Table 6: Influence of Gender Related Factors on Students' Disciplinary Problems

No	Items	Respondent	Responses					M	WM	Remark
			SA	A	UN	DA	SD			
			N	N	n	N	n			
1	Male students are purposely staying away from school	T	13 (6.5%)	146 (72.6%)	6 (3%)	35 (17.4%)	1 (0.5%)	3.67	3.82	Agree
		S	152 (32.8%)	208 (44.8%)	58 (12.5%)	29 (6.2%)	17 (3.7%)	3.97		
2	Boys are more troublesome than girls	T	72 (35.8%)	121 (60.2%)	1 (0.5%)	3 (1.5%)	4 (2%)	4.26	4.12	Agree
		S	221 (47.6%)	131 (28.2%)	38 (8.2%)	27 (5.8%)	47 (10.1%)	3.97		

Note: SA=strongly agree (4.5 to 5.00) A=agree (3.49 to 4.49) UN=undecided (2.49 to 3.49) D=disagree (1.49 to 2.49) SD=strongly disagree (1.00 to 1.49) M=mean WM=weight mean

Table 6 shows mean values for gender related factors perceived by selected teachers and students. Teachers and students agreed that two items under gender related factors: "male students are purposively staying away from school" and "boys are more troublesome than girls" are the causes that influence on students' disciplinary problems.

7. Role Played by School Management

School management plays a key role to decrease students' disciplinary problems. There are five items under this dimension, the role played by school management.

Table 7: Influence of Role Played by School Management on Students' Disciplinary Problems

No	Items	Respondent	Responses					M	WM	Remark
			SA	A	UN	DA	SD			
			N	N	n	n	n			
1	Provide advice	T	53 (26.4%)	141 (70.1%)	0 (0%)	3 (1.5%)	4 (2%)	4.17	4.04	Agree
		S	117 (25.2%)	217 (46.8%)	107 (23.1%)	14 (3%)	9 (1.9%)	3.9		
2	Strict follow up	T	18 (9%)	146 (72.6%)	8 (4%)	27 (13.4%)	2 (1%)	3.75	3.94	Agree
		S	172 (37.1%)	123 (45.9%)	53 (11.4%)	14 (3%)	12 (2.6%)	4.12		
3	Identify the problem of students	T	29 (14.4%)	155 (77.1%)	5 (2.5%)	5 (2.5%)	7 (3.5%)	3.97	3.86	Agree
		S	95 (20.5%)	219 (47.2%)	101 (21.8%)	32 (6.9%)	17 (3.7%)	3.74		
4	Send the students to director	T	46 (22.9%)	139 (69.2%)	6 (3%)	4 (2%)	6 (3%)	4.07	4.1	Agree
		S	177 (38.1%)	218 (47%)	36 (7.8%)	20 (4.3%)	13 (2.8%)	4.13		
5	Discuss the problem with parents	T	16 (9%)	152 (75.6%)	3 (1.5%)	28 (13.9%)	0 (0%)	3.8	3.74	Agree
		S	104 (22.4%)	160 (34.5%)	161 (34.7%)	25 (5.4%)	14 (3%)	3.68		

Note: SA=strongly agree (4.5 to 5.00) A=agree (3.49 to 4.49) UN=undecided (2.49 to 3.49) D=disagree (1.49 to 2.49) SD=strongly disagree (1.00 to 1.49) M=mean WM=weight mean

Table 7 shows mean values for role played by school management. According to Table 7, teachers and students agreed with all responsibilities of school management. They responded that school management employed five steps concerned with students' disciplinary problems. By doing these responsibilities, students' disciplinary problems can be decreased.

Findings of Qualitative Research. The qualitative study was conducted through principals and subject deans from two selected Basic Education High Schools. Two principals and 8 teachers participated in qualitative research.

Principals' Responses

"The principals responded that fighting among students and truancy are most common types. So they will establish clear rules and procedures, instruct students how to follow them, make clear communication concerning with the consequences of misbehaviors, discuss school disciplinary committee and parents and advise teachers and parents to facilitate their children's education."

Teachers' Responses

"Teachers responded that use of cell phones by students during the class and abuse of drugs are most common types and so they will counsel the students who do not follow the school rules, advise their undesirable behaviors towards desirable behaviors, give students needed affection for their lives, and discuss the disciplinary problems openly and find together various ways to solve these problems."

Discussion

Discipline is very important to everyone, especially every principal and every teacher who are working in school environment. Depending on the discipline laid down by schools, disciplinary problems of students may be more or less occurred.

According to the previous research findings, it was found that there were so many students' disciplinary problems and causes teaching learning situation. Bowman (2004) viewed that parents' failure to teach their children discipline is identified as the greatest contributing factor to disciplinary problems in schools. Effective teachers can create a warmly positive environment in the first weeks of the year teaching classroom routine and procedures as opposed to academic content because those are the keys to a well-managed, organized classroom. Principals must set clearly stated expectations for student behaviour and ensure their consistent enforcement to foster an orderly environment (Bett et al., 2010).

If the school curriculum is irrelevant to students' interest and their desire to learn, motivation for learning will not be promoted. Therefore, the curriculum should centralize more to societal aspiration (Erena, 2015).

Learners with poor visions, difficulty in hearing, cripple, or hunch back can cause disciplinary problems in their class. Irresponsibility, poor social contact, lack of interest in school activities, habitual truancy lying, cheating, stealing, vandalism, resistance to school rules and regulations, disrespect or discourtesy and emotional immaturity are common disciplinary problems that are caused by learners (Levy Dalumpines, 2011).

According to the current study, there were many influencing factors on the types and causes of students' disciplinary problems. Among these, learners related factors are the most common. By the results of quantitative and qualitative research, it was observed that use of cell phones by students during the class, fighting among students, truancy and abuse of drugs are the most common types of students' disciplinary problems relating to the learners' factors.

Nevertheless, the principals and teachers have been occurred various students' disciplinary problems in their daily school lives. So, to minimize these problems, they have to know what are the main types and causes of these students' disciplinary problems and how to maintain anticipated solutions relating to their causes. Teachers also should build strong relationship with their students and they should try to familiar with the students' background situation. In addition, guidance and advice of teachers can help students to overcome their disciplinary problems. The content of curriculum should be flexible with the geographical area and should foster the moral aspiration of their citizen. It is important that the curriculum focuses on the needs of the current society.

As revealed in the study, the role of school community dealing with disciplinary problems are provision of advice, strict follow up, and trying to understand the students' disciplinary problems, referral to the guidance and counseling center to get proper advice and sending to the school management committee. The role of guidance and counseling service is very crucial in students' disciplinary problems.

Conclusion

The research was conducted to study the types and causes of students' disciplinary problems through the perceptions of teachers and students. As indicated by this study, students' appropriate behaviour is crucial to attain successful education. For teachers to teach effectively and for learners to receive effective learning well-disciplined atmosphere is required. All stakeholders should involve in appropriate school discipline practices. To minimize students' disciplinary problems, principals, teachers and all stakeholders should work together. To improve teachers' effectiveness in handling students' disciplinary problems, school administrators should provide time and structures for collaborative learning teams to meet.

Through interviewing, principals and teachers said that truancy is the most common disciplinary problems. For such problems, teachers should build strong relationship with their students and they should try to familiar with the students' background situation. In addition, guidance and advice of teachers can help students to overcome their disciplinary problems.

Moreover, lack of cooperation between parents and schools in solving students' disciplinary problems were also found to be very weak. Students' attitude and social behavior are influenced by parental control at home. Lack of good modeling and lack of commitment to their profession by teachers may be the cause of students' disciplinary problems. Moreover, their lack of establishing conducive school environment for their children and consistent corrective measures for misbehaving students may be the causes of students' disciplinary problems. Teachers should have a sense of cheerfulness, a sense of friendliness, a sense of warmness, a sense of wide cultural background and experience. Not only teachers but also school and school administrators play as a key role in handling students' disciplinary problems. The principal's good leadership management can direct toward good classroom climate. Sometimes, strict school rules foster students to stay away from school. In order to successfully achieve the objectives of the school, all members of the school such as principal, teachers, students, parents and other supportive staffs are required to adhere to various behavioral patterns for maximum performance.

Therefore, school needs good discipline which is required to ensure that school is able to provide quality education for all students and to guarantee the care and safety of the school community. Therefore, school should provide clear rules and regulation for do and don't. Principal should possess good leadership management skills and relationship between teachers and principal should be good. Moreover, according to the results of the study, principals and teachers will be able to get good ideas of how to prevent their students' disciplinary problems.

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THE RELATIONSHIP BETWEEN PRINCIPALS' INSTRUCTIONAL LEADERSHIP BEHAVIOURS AND ORGANIZATIONAL CLIMATE AT SELECTED BASIC EDUCATION HIGH SCHOOLS IN MONYWA TOWNSHIP

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Abstract

The main aim of this study was to investigate the principals' instructional leadership behaviours and organizational climate at Selected Basic Education High Schools in Monywa Township. Two existing survey instruments, *Principal's Instructional Leadership Scale* and *Organizational Climate Descriptive Questionnaire*, measure the relationships among the constructs. All senior, junior, and primary school teachers (N= 409) from six selected high schools in Monywa Township participated in the study. Descriptive statistics was used in analyzing data. The results of the study indicated that the extents of principals' instructional leadership behaviours for selected high schools in Monywa Township were high with mean value (3.77) and the levels of organizational climate of schools was also high according to openness level (SdS: above 600). Correlational analysis demonstrated highly positive relationship between principals' instructional leadership behaviours and organizational climate (r=.782, p< 0.01). Thus, there was positive and significant relationship between principals' instructional leadership behaviours and organizational climate perceived by teachers in selected high schools. In this study, it was found that principals' instructional leadership behaviours were highly correlated with organizational climate of schools to create an open climate of schools.

Key Words: Instructional Leadership behaviours, organizational climate

Introduction

Throughout the history, human beings have met their need for manpower through education. Education, whether planned, formal or more traditional and informal, occurs in every environment. Especially, for educational institutions, which have a more planned or programmed structure, to reach their aims, administrators are one of the most important factors and they are expected to be qualified people (Hoy and Miskel, 2010, cited in

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Zorlu, 2016). Therefore, principal is the main key person for an educational organization.

Research (Pellicer, Keefe &Mc Cleary, 1990, cited in Grizzard, 2007) has consistently focused on the features characteristics of effective schools. Strong instructional leadership continues to be an essential correlate of effective schools research (Edmonds, 1979, cited in Grizzard, 2007). Administrators identify with and recognize that instructional leadership is necessary component for a successful school in the age of No Child Left Behind mandates and accountability. As instructional leaders, principals can foster an understanding of the school vision, facilitate implementation of the mission, and establish the school climate. Therefore, school climate, leadership, and quality instruction are frequently associated with effective schools (Kelly, Thorton & Daugherty, 2005).

Organizational climate of school is established and enhanced by the instructional leader. Consequently, education organizations are known to be very important in terms of institutional qualities. In order for educational institutions to be successful in achieving to their objectives, organizational climate plays a major role. In educational institutions, a positive climate can be achieved by influential leaders (Mustafa, 2015). For this reason, instructional leadership behaviours and organizational climate are the key elements in quality assurance of modern education organizations. Therefore, it is necessary to study the principals' instructional leadership behaviours that can create an open climate of school, which in turn may impact the high achievement of students and teachers.

Aims of the Study

The general aim of the study is to examine teachers' perceptions on relationship between principals' instructional leadership behaviours and organizational climate at selected Basic Education High Schools in Monywa Township.

The specific purposes of the study are:

- To measure the extent of teachers' perceptions on their principals' instructional leadership behaviours at selected Basic Education High Schools in Monywa Township,

- To measure the extent of teachers' perceptions on organizational climate of their schools at selected Basic Education High Schools in Monywa Township and
- To measure if any relationship exists between the principals' instructional leadership behaviours and organizational climate at selected Basic Education High Schools in Monywa Township.

Research Questions

1. To what extent do teachers perceive principals' instructional leadership behavioursat selected Basic Education High Schools in Monywa Township?
2. To what extent do teachers perceive organizational climate at selected Basic Education High Schools in Monywa Township?
3. Is there any relationship between principals' instructional leadership behaviours and organizational climate at selected Basic Education High Schools in Monywa Township?

Theoretical Framework

Principals' Instructional Leadership Behaviours (Sisman, 2016)

- Identifying and sharing school goals
- Management of instructional programs and teaching process
- Evaluation of teaching process and students
- Supporting and developing teachers
- Creating a safety learning climate and work environment

Organizational Climate for Secondary Schools (Hoy, Tarter &Kottkamp, 1991)

- Supportive principal behaviour
- Directive principal behaviour
- Engaged teacher behaviour
- Frustrated teacher behaviour
- Intimate teacher behavior

Review of Related Literature

Instructional Leadership

Leadership has very important impacts on the quality of the school organization and on students' outcome. Leadership skills of a school principal have been considered as one of the main factors on school effectiveness (Sisman, 2016).

Instructional Leadership Theories

The leadership theories provide framework for the historical evolution of instructional leadership. Leadership in social organizations evolves as the social and political climate influence the organization. Therefore, the instructional leadership construct amalgamates trait, behaviour, contingency, charismatic, transformational and transactional theories. Strong instructional leaders possess specific traits and behaviours, such as charisma, which can be applied in different situations and environments. The premise of instructional leadership is to lead teachers and pupils to reach full potentials by creating climates characterized by defining and communicating shared goals, monitoring the teaching and learning process, and promoting life-long learning of stakeholders and the organization (Alig-Mielcarek, 2003).

Instructional leadership has many different definitions and models that conceptualize it starting from the early 1900's. In this study, the dimensioning by Sisman (2016) was taken into consideration.

(i) Identifying and sharing school goals- It is expected from a school principal playing a leading role in identifying school goals by initially determining school vision and mission. The importance of school goals need to be emphasized explained and shared during the meetings with students, teachers and parents (Sisman, 2016).

(ii) Management of instructional programs and teaching process- One of the main inputs of school is programs. In order to successfully implement such programs, necessary conditions and maximum learning opportunities need to be prepared. In successful schools, school principals have a pivotal role in planning, implementing and coordinating of programs (Sisman, 2016).

(iii) Evaluation of teaching process and students- This dimension involves teaching, inspecting, evaluating of programs, monitoring and evaluating student development. School principal should discuss and provide feedback about the teaching process and results of student evaluation with the school staff (Sisman, 2016).

(iv) Supporting and developing teachers- One of the main responsibilities of the school principal is to help everyone in the school develop their professional qualifications, also, to enable teachers make use of these new knowledge and qualifications in the school. Otherwise, all the effort made for developing teachers' performance would be futile. In this respect, the school principal has an essential role in rewarding and acknowledging teachers for their various accomplishments (Sisman, 2016).

(v) Creating a safety learning climate and work environment- School principals need to create and maintain a positive teaching-learning environment and climate, which help students and teachers to work enthusiastically. Therefore, school principals should know and motivate various subcultures and tendencies in school. They should lead and enable to create and share innovative ideas related to teaching, learning and education (Sisman, 2016).

Organizational Climate

The concept of organizational climate originated in the late 1950s as social scientists studied variations in work environments. Teachers' performance in schools is in part determined by the atmosphere or climate in which they work.Therefore, organizational climate is a general synthesizing concept that is directly influenced by the principal, which in turn affects the motivations and behaviours of teachers (Hoy & Forsyth, 1986). The early work of Halpin and Croft (1963) in conceptualizing school climate laid the foundation for many of the frameworks that came after. In this study, organizational climate can be classified as followed:

(i) Supportive principal behaviour- is characterized by efforts to motivate teachers by using constructive criticism and setting example through hard work. At the same time, the principal is helpful and concerned with the personal professional welfare of teachers. Supportive behaviour is directed toward both the social needs and task achievement (Hoy, Tarter &Kottkamp, 1991).

(ii) Directive principal behaviour- is rigid, close supervision. The principal maintains constant monitoring and control over all teacher and school activities, down to the smallest details (Hoy, Tarter &Kottkamp, 1991).

(iii) Engaged teacher behaviour- is reflected by high faculty morale. Teachers are proud of their schools, enjoy working with each other, and are supportive of their colleagues. Teachers are not only concerned about each other; they are committed to the success of their students. They are friendly with students, trust students, and are optimistic about the ability of students to succeed (Hoy, Tarter &Kottkamp, 1991).

(iv) Frustrated teacher behaviour- refers to a general pattern of interference from both administration and colleagues that distracts from the basic task of teaching. Routine duties, administrative paper work, and assigned non-teaching duties are excessive; moreover, teachers irritate, annoy and interrupt each other (Hoy, Tarter &Kottkamp, 1991).

(v) Intimate teacher behaviour- reflects a strong and cohesive network of social relationships among the faculty. Teachers know each other well, are close personal friends, and regularly socialize together (Hoy, Tarter &Kottkamp, 1991).

Definitions of Key Terms

Instructional Leadership

Instructional leadership encompasses those actions that a principal takes, or assigns to others, to raise growth in student learning and consists of following tasks: describing the purpose of schooling: setting school-wise goals: providing the resources needed for learning to occur: supervising and evaluating teachers: coordinating staff development programs: and creating collegial relationships with and among teachers (De-Bevoise, 1984).

Instructional Leadership Behaviours

Instructional leadership behaviours can be defined as behaviors that administrators exhibit themselves and that the behaviours they make others exhibit by influencing them (Sisman, 2004, cited in Zorlu, 2016).

Organizational Climate

The organizational climate of school is the result of the reciprocal effects of the teachers' behavior pattern as a group and the principal's behaviour pattern as a leader (Silver, 1983). According to Halpin and Croft (1963), the organizational climate of school is the blend of two important dimensions of interpersonal interaction: the principal's leadership and the teachers' interactions.

Principal's Behaviour: Principal's behaviour is a dimension of the school climate including supportive behaviour and directive behaviour (Hoy, Tarter &Kottkamp, 1991).

Teachers' Behaviour: Teachers' behaviour is a dimension of the school climate consisting of engaged behaviour, frustrated behaviour and intimate behaviour (Hoy, Tarter &Kottkamp, 1991).

Methodology

This study used a descriptive statistical design. Both quantitative and qualitative research methods were used to carry out the study. For quantitative study, questionnaire survey was used. Open-ended questions were used in qualitative study.

Population and sample

The target population for this study was all teachers (primary teachers, junior teachers and senior teachers) at selected Basic Education High Schools in Monywa Township. A distribution of participating schools was monitored and adjusted using the criterion that the principal had been at the current school for at least two years. Out of 11 high schools with the principals' service (at least two years at the current school) in Monywa Township, 6 high schools (54.55% of the total schools) met the criterion. Therefore, these schools were selected for the main study.

Instrumentation

In this study, the questionnaire survey method was chosen as an instrument to collect the appropriate data. As instrument, two sets of questionnaire, *Principal's Instructional Leadership Scale* and *Organizational Climate Description Questionnaire* for all teachers (including primary teachers, junior teachers and senior teachers) were used to gather information for this study.

The instructional leadership behaviours scale used for this study was developed by Sisman (2004, cited in Zorlu, 2016). It is a 50 items, five point Likert-type scale and consists of five subscales; defining school goals, managing the instructional programs, evaluating the instructional process, supporting teachers and professional development and creating a safety climate. The answers to the questions are rated as: 1 (never), 2 (rarely), 3 (sometimes), 4 (often) and 5 (always).

The Organizational Climate Questionnaire used in this study was developed by Hoy, et.al (1991). It is a 34-item, four point Likert-type scales and consists of five subscales, supportive principal behaviour (7-items), directive principal behaviour (7-items), engaged teacher behaviour (10-items), frustrated teacher behaviour (6-items) and intimate teacher behaviour (4-items). This study consisted of 5-point Likert scale ranging from (1) "never occurs", (2) "rarely occurs", (3) "sometimes occurs", (4) "often occurs" and (5) "always occurs".

Procedure

First and foremost, relevant literature was explored. Next, the instrument was constructed in order to collect the required data. For the content validity, the questionnaires were evaluated and revised by the experts who are well experienced and mastery in this field. According to this review, comments and suggestions, the instruments were modified again. To test the reliability of questionnaire items, pilot study was conducted.

After requesting permission from the responsible persons, questionnaires for teachers were distributed to all teachers in six selected schools on the 5th and 6th Dec, 2016 and collected those on 12nd Dec, 2016. Data obtained from the study were scored. Based on the results of the responses, this study was conducted in order to investigate the relationship between principal's instructional leadership behaviours and organizational climate in schools. For qualitative study, open-ended questions were developed under the guidance of the supervisor.

Data Analysis

The unit of analysis was the school; therefore individual respondent scores were aggregated to the school level for the independent and dependent variables of this study. After scoring of various items in each area, the data were computed with the Statistical package for Social Sciences (SPSS) software version 20, and analyzed using descriptive statistics such as means and standard deviations for each variable. By using SPSS (Statistical Package for Social Sciences), data obtained from Instructional Leadership Behaviours Questionnaire were analyzed. The scoring direction for each item is identified as 1.00-1.49= very low extent 1.50-2.49= low extent 2.50-3.49= moderate extent 3.50-4.49= high extent 4.50-5.00= very high extent.

After administering and collecting data concerned with school climate obtained from OCDQ-RS, an average score was developed for each of the 33 items. Next, the mean scores were added from each dimension are summed the average item scores as follows:

Supportive Behaviour (S) = 5+6+23+24+25+29+30

Directive Behaviour (D) = 7+12+13+18+19+31+32

Engaged Behaviour (E) = 3+4+10+11+16+17+20+28+33

Frustrated Behaviour (F) = 1+2+8+9+15+22

Intimate Behaviour (Int) = 14+21+26+27

To compare the score with the normative sample, the score was converted to a standardized score (SdS) with a mean of 500 and a standard deviation of 100. To develop SdS score, the difference between the school score and the mean score of the normative sample was calculated (See Table 3.1).

Table 3.1 : Formulas to Develop the OCDQ-RS Standardized Scores

Factor	**Formula**
Supportive Behaviour (S)	SdS for S= 100(S-18.19)/2.66+500
Directive Behaviour (D)	SdS for D= 100(D-13.96)/2.49+500
Engaged Behaviour (E)	SdS for E= 100(E-26.45)/1.32+500
Frustrated Behaviour (F)	SdS for F= 100(F-12.33)/1.98+500
Intimate Behaviour (Int)	SdS for Int= 100(Int-8.80)/0.92+500

Source: Hoy, W.K., Tarter, C.J. &Kottkamp, R.B. (1991) *Open Schools/Healthy Schools: Measuring Organizational Climate*.

The general openness index provides a measurement of school climate also called the level of openness using four of the five factors. Supportive principal behaviour, directive principal behaviour, engaged teacher behaviour, frustrated teacher behaviour are the factors of used to determine the general openness index for a school.

$$\textbf{Openness} = \frac{\textbf{(SdS for S)+(1000-SdS for D)+(SdS for E)+(1000-SdS for F)}}{\textbf{4}}$$

Source: Hoy, W.K., Tarter, C.J. &Kottkamp, R.B. (1991) *Open Schools/Healthy Schools: Measuring Organizational Climate*.

Research Findings

The data collected were analyzed in terms of mean values, standard scores and Pearson's Product Moment Correlation. The findings were presented in the following.

4.1 For Research Question No (1)

Table 4.1: Mean Values of Respondents' Perceptions on Instructional Leadership Behaviours in All Selected High Schools

School	Dimensions					ILB
	DSG	MIP	EIP	PD	CLE	
A	4.12	4.19	3.90	3.76	4.18	4.03
B	3.87	3.92	3.76	3.56	3.89	3.80
C	3.23	3.47	3.22	2.68	3.11	3.14
D	3.84	4.03	3.81	3.65	3.65	3.79
E	4.17	4.20	3.92	3.52	3.92	3.94
F	3.94	4.01	3.75	3.50	3.78	3.80
Total	3.88	3.98	3.73	3.46	3.80	3.77

1.00-1.49= very low extent 1.50-2.49= low extent 2.50-3.49= moderate extent 3.50-4.49= high extent 4.50-5.00= very high extent

Note: **DSG** = Defining School Goals **MIP** = Managing Instructional Program
EIP = Evaluating Instructional Process **PD** = Professional Development
CLE = Creating learning environment **ILB** = Instructional Leadership Behaviours

Table 4.1 indicates that principals' instructional leadership behaviours domains for all selected High Schools based on the perceptions of teachers from those schools. It was found that the domains of principals' instructional leadership behaviours: "managing the instructional program" (3.98) had the highest mean, followed, in descending order, by "defining school goals" (3.88), "creating learning environment" (3.80), "evaluating instructional process" (3.73) and "professional development" (3.46).

The total mean value for respondents' perceptions on principal's instructional leadership behaviours was high. It implied that the extents on principal's instructional leadership behaviours in all schools were high. Among them, School A had the highest extent of principal's instructional leadership behaviours with mean value (4.03) and School C had the lowest extent with mean value (3.14) within moderate extent of instructional leadership behaviours in school. In addition, School C had mostly moderate extent in each dimension of instructional leadership behaviours. Thus, principal in School C moderately performed instructional leadership behaviours than other principals in selected schools.

4.2: For Research Question No (2)

Table 4.2: Mean Values of Respondents' Perceptions on Organizational Climate in All Selected High Schools

School	Dimensions					Organizational Climate
	Supportive	Directive	Engaged	Frustrated	Intimate	
A	4.09 (28.65)	4.08 (28.57)	4.01 (40.11)	3.40 (17.01)	3.75 (15)	3.92
B	3.89 (27.21)	4.01 (28.05)	4.04 (40.38)	3.41 (17.08)	3.95 (15.8)	3.89
C	2.78 (19.45)	3.40 (23.8)	3.37 (33.67)	2.89 (14.44)	3.46 (13.84)	3.19
D	4.03 (28.24)	4.02 (28.12)	3.84 (38.4)	3.65 (18.23)	3.79 (15.16)	3.88
E	4.07 (28.5)	4.06 (28.44)	4.05 (40.52)	3.40 (17.01)	3.60 (14.39)	3.91
F	3.6 (25.18)	3.80 (26.62)	4.00 (40.04)	3.22 (16.11)	3.69 (14.76)	3.72
Total	3.74 (26.19)	3.90 (27.28)	3.91 (39.05)	3.31 (16.54)	3.71 (14.87)	3.76

1.00-1.49= never 1.50-2.49= rarely 2.50-3.49= sometimes 3.50-4.49= often 4.50-5.00= always

Table 4.2 depicts subscales of organizational climate of schools perceived by teachers for all selected high schools. It was also found that “teachers’ engaged behaviours” (3.91) had the highest mean, followed in descending order, by “principal’s directive behaviour” (3.90), “principal’s supportive behaviour” (3.74), “teachers’ intimate behaviours” (3.71) and “teachers’ frustrated behaviours” (3.31). The total mean value for organizational climate in all selected high schools was (3.76). It implied that the principal’s supportive and directive behaviours and the teachers’ engaged, frustrated and intimate behaviours were often occurred in those schools. Among these school, School A had the highest level of mean score (3.92) and School C had the lowest level of mean score (3.19). It implied that the principal’s and teachers’ behaviours in School C were sometimes occurred although other schools were often occurred from the perspectives of teachers in all selected schools.

After this, the general openness index for secondary school climate could be computed regarding to the respondents’ perceptions using the normative data stated in New Jersey sample of secondary schools. If the score of organizational climate was more than 620, it was certain that the school had open climate.

Table 4.3: A Summary of Dimensions and Openness of Organizational Climate of All Selected High Schools

School	**Dimensions**					**Openness**
	Supportive	**Directive**	**Engaged**	**Frustrated**	**Intimate**	
A	893.23	1086.75	1534.85	736.36	1173.91	651.24
B	839.10	1065.86	1555.3	739.90	1260.87	647.16
C	547.37	895.18	1046.97	606.57	1047.83	523.15
D	877.82	1068.68	1405.30	797.98	1191.30	604.12
E	887.60	1081.53	1565.90	736.36	1107.61	658.90
F	762.78	1008.43	1529.55	690.90	1147.83	648.25
Total	800.75	1034.94	1454.55	712.63	1159.78	626.93

<400 = very low, 400-449 = low, 450-474 = below average, 475-489 = slightly average, 490-510 = average, 511-524 = slightly above average, 525-549 = above average, 550-600 = high, >600 = very high

Table 4.3 depicts a summary of behavior dimensions and openness of school climate of all selected high schools. According to the Table 4.3, it was found that SdS scores for School A, B, D, E and F were very high and those of School C were above average. Thus, the levels of organizational climate for selected High Schools were generally high because the scores were 525-549 and above 600. In other words, the selected schools had open climate.

4.3 For Research Question No (3)

Table 4.4: Correlation between Instructional Leadership Behaviors and Organizational Climate in All Selected High Schools

Two Groups	Instructional Leadership Behaviors	Organizational Climate
Instructional Leadership Behaviors	1	.782**
Organizational Climate	.782**	1

**Correlation is significant at the 0.01 level (2-tailed).

Table 4.4 shows that principal's instructional leadership behaviours were highly correlated with organizational climate of schools (r =.782, p< 0.01). Thus, the value of correlation coefficient (r = .782)represents high correlation as interpretation of the relation between two variables. To sum up, the more principals exhibited instructional leadership behaviours in schools, the higher the perception level of organizational climate was.

Conclusions and Discussions

The purpose of this study was to study the relationship between principals' instructional leadership behaviours and organizational climate at selected high schools in Monywa Township. Three research questions guided this study.

Research Question No (1) investigated principals' instructional leadership behaviours as indicated by teachers in selected Basic Education High Schools in Monywa Township. Based on the research findings, the extents of teachers' perceptions of principals' instructional leadership behaviours were found at high. It was found that the principal could perform the task as an instructional leader in schools. This is due to a larger role of a headmaster in creating a good learning process, the support and attention of the principal motivating and moral support to teachers in managing the learning process in schools as an effort to improve the quality of education (Rosmaniar and Marzuki, 2016).

Research Question No (2) examined the levels of teachers' perceptions on organizational climate in selected Basic Education High Schools in Monywa Township. In this study, all of the selected high schools had open organizational climate because all dimensions of behaviour were very high with regard to teachers' perceptions. The openness levels of School A, B, D, E and F were very high while the climate of School C was above average in general openness index. In brief, openness refers to a school climate where both the teachers' and principal's behaviours are authentic, energetic, goal-directed, and supportive, and in which satisfaction is derived from both task accomplishment and social interaction (Hoy, Tarter &Kottkamp, 1991).

One way analysis of variance (ANOVA) was computed to know whether there were significant differences in respondents' perceptions on principals' instructional leadership behaviours and organizational climate according to types of schools, age, service and qualification. One of the other important findings of the study is that teachers' age and length of service are not effective determinants on their views related to principal's instructional leadership and organizational climate (Sahin, 2011). According to these findings, there was not statistically significant difference between the means of participants' rating with regard to age and qualifications. However, there was statistically significant difference between the means of respondents' rating according to the types of schools. The length of service in organizational climate was also slightly different since the mean values of teachers with service below 5-years is greater than the mean values of teachers with service between 15 and 19 years.

Finally, Research Question No (3) explored the relationship between principals' instructional leadership behaviours and organizational climate in selected Basic Education High Schools in Monywa Township. According to teachers' perceptions, there was a positive and significant relationship between principals' instructional leadership behaviours and organizational climate. This means that the teachers' perceptions on their principals' instructional leadership behaviours increase, the organizational climate of their schools also increases. In essence, it is believed that in institutions where instructional leadership behaviours are exhibited, it is easier to create an effective organizational climate.

In conclusion, it is important to understand clearly that the instructional leadership behaviours of principal were seen as one of the many managerial tasks of the school principal which involved the school principal's immersion in the actual teaching and learning program of the school. If the instructional leadership in the school is not fully implemented well, it can be seen from the lack of supervision and monitoring of the learning process in school. This problem occurs when school principals are occupied with all the daily responsibilities for managing and conducting school with insufficient time to implement instructional leadership. Principals not only need to focus on the instructional program, but also need to understand the importance of school climate. School leadership creates the best conditions for learning (Fullan, 2007, cited in Dupont, 2009).

Moreover, the principals need to know why and how their instructional leadership behaviours can bring into existence of a particular type of organizational climate. It will help them to take the necessary steps to improve the climate in their schools. The principal must create a quality workplace for teachers and increase the opportunity for quality teaching in each classroom through instructional leadership. The principal should create a climate of high expectations in schools by communicating with teachers, supporting and participating in staff development activities. A positive school climate affects everyone associated with the school: students, staff, parents and the community.

Considering to all the studies, instructional leadership behaviours and organizational climate are quite important for organizations. In terms of attaining educational success, a leader who exhibits instructional leadership behaviours is very important. Kelly, Thornton and Daugherty (2005) suggested that educational leadership was possibly the single most important determinant of an effective learning environment. Thus, an effective instructional leader should emphasize the teaching-learning process as well as the success of all teachers and students by advocating, nurturing and sustaining a school climate conducive to student learning and staff professional growth.

Recommendations for Further Research

The findings of this study have led the researcher to make the following recommendations for further research.

Like this research, more research concerned with principals' instructional leadership behaviours and organizational climate in elementary and secondary schools should be further conducted in other Townships, States or Regions in Myanmar. Then, a large sample size should be considered so that many different results or reasons could produce to improve principals' instructional leadership behaviours and organizational climate.

Since the researcher has limited time and insufficient resources, only the principals' instructional leadership behaviours could be studied and additional research should be conducted on the curriculum-leadership of principals in managing curriculum and instruction within one district with respect to specific principal practices and behaviours.

In this study, only principal's behaviour and the teachers' behaviour could be studied upon the organizational climate. Really, organizational climate is the blend of principal's behaviour, teachers' behaviour, students' behaviour and parents' behaviour. Thus, further research concerned with school climate including all these behaviours should be studied.

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A STUDY OF PEDAGOGICAL KNOWLEDGE OF LOWER SECONDARY SCIENCE TEACHERS FOR CREATING LEARNING ENVIRONMENT IN THE SELECTED SCHOOLS OF KYAIKLAT TOWNSHIP

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Abstract

The primary purpose of this research is to study pedagogical knowledge for creating a learning environment in the selected schools of Kyaiklat Township, Ayeyarwady Region. A total of 110 lower secondary science teachers from selected Basic Education Schools participated in this study. The level of pedagogical knowledge and the variation of pedagogical knowledge of lower secondary science teachers for creating a learning environment were explored. Quantitative approaches were applied in this study. Questionnaire was developed by the researcher based on the related literature. The reliability coefficient (Split-half) was 0.88 for the questionnaire to explore the pedagogical knowledge of lower secondary science teachers for creating a learning environment.

Descriptive statistics, IPC (Item Percent Correct), MPC (Mean Percent Correct) were employed for the analysis of quantitative data. In interpreting the MPC and IPC values, 1to 49% is considered as unsatisfactory level, the value between 50 to 74 % as fairly satisfactory and the value 75 to 100% as satisfactory. According to the total mean percent values, most of the lower secondary science teachers had satisfactory level of pedagogical knowledge for creating a learning environment.

Introduction

No human beings are able to survive properly without education. By the means of education only, one's potential can be used to maximum extent. Education tells men how to think, how to work properly, and how to make decision (Ashwini, 2010).

The goal for all teachers is to provide effective instruction that leads to students' learning. However, that goal is greatly dependent upon having a safe and supportive environment in which teachers can teach and students can learn. Without such an environment, instructional and learning time is lost (Walker et al., 1995). Moreover, students' learning achievement depends on

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the effective learning environment. But teaching is a complex and challenging work. Teachers need in-depth knowledge of the subject areas they teach, how students learn that content and an understanding of classroom environments that optimize learning. The classroom is a learning environment where interaction occurs among teachers and students, and learning takes place.

Significance of the study

The teaching of science offers students the ability to access a wealth of knowledge and information which will contribute to an overall understanding of how and why things work like they do. Science is able to explain the mechanics and reasons behind the daily functioning of complex systems, which ranges from the human body to sophisticated modern methods of transport. Children and students are able to use this knowledge to understand new concepts, make well-informed decisions and pursue new interests. Science also helps to provide tactile or visible proof of many facts we read about in books or see on the television; this helps to increase understanding and helps children and teenagers to retain that information (Centre for Education in Science & Technology, n.d).

Numerous factors contribute to the quality of teaching-the teacher's personal characteristics, knowledge of subject matter, and philosophical and psychological understanding among others. One indispensable factor is pedagogy- knowledge of the principles and practices of teaching. To be effective in the classroom, teachers must be able to plan lessons and units, to organize and manage classrooms, and to execute teaching strategies that enable learners to grasp key ideas in the forms intended by the teacher (McNell and Wiles, 1990). A teacher with deep pedagogical knowledge understands how students construct knowledge and acquire skills; develop habits of mind and positive dispositions towards learning (Koehler, 2011).

Learning is a unique process that is directly and indirectly influenced by variables such as teachers' beliefs, teaching instruction, students' attitudes and the classroom learning environment. The working environment or school climate may also influence teachers in conducting teaching, thus determining student learning and student outcomes (Wahyudi and Treagust, 2004).

Along with teachers, teaching methods, curriculum, and resources, the learning environment (natural, social and cultural) determines teaching and learning processes, and thus in turn influences students' outcomes (Ministry of Education and Culture, 1994, cited in Wahyudi and Treagust, 2004).

Effective teaching approaches which aim for students' conceptual change require learning environments that are sensitive to learners' needs, feelings, and ideas (Scott, Assoko & Driver, 1992, cited in Wahyudi and Treagust, 2004).

According to White (1989, cited in Wahyudi and Treagust, 2004), the context in which learning takes place must be supportive and comfortable and free from any form of repression.

According to Haertel (1991, cited in Wahyudi and Treagust, 2004), students' effective learning is positively related to the levels of cohesiveness, satisfaction, and task orientation in the classroom, and negatively related to levels of friction and disorganization. Therefore, for the sake of students' effective learning, teachers must establish a classroom learning environment within which students feel confident and are able to express and discuss their opinions freely.

Teacher should create a learning environment at the beginning of the year where the exchange of ideas is encouraged, respect for all students and their work is fostered, and a sense of community is established (Moore, 2007).

Without a good learning environment, teacher cannot use sophisticated methods to best advantage. Understanding the content to teach and being able to form objectives and construct unit and lesson plans are all essential teaching skills. Being able to implement these plans through a particular teaching strategy is also a central skill in teaching. But there is one additional skill that is so important that it sometimes overshadows the rest. It is creating a learning environment that is productive to students' learning.

For these reasons, it is necessarily important to study the pedagogical knowledge of lower secondary science teachers for creating a learning environment.

Aims of the Study

Main Aim

- To study pedagogical knowledge of lower secondary science teachers for creating learning environment

Specific Aims

- To investigate pedagogical knowledge of lower secondary science teachers for creating a learning environment in terms of their age groups
- To investigate pedagogical knowledge of lower secondary science teachers for creating a learning environment in terms of their teaching service
- To investigate pedagogical knowledge of lower secondary science teachers for creating a learning environment in terms of gender

Research Questions

- To what extent do the lower secondary science teachers possess pedagogical knowledge for creating learning environment?
- What is the variation in the pedagogical knowledge for creating a learning environment in terms of their age groups?
- What is the variation in the pedagogical knowledge for creating a learning environment in terms of their teaching service?
- What is the variation in the pedagogical knowledge for creating a learning environment in terms of gender?

Definitions of Key Terms

Pedagogical Knowledge

- Pedagogical knowledge is a generic form of knowledge that involves knowledge about techniques or methods to be used in the classroom; the nature of the target audience; and strategies for evaluating student understanding (Koehler, 2011).
- In this study, the teachers' pedagogical knowledge is defined as the knowledge possessed by a primary science teacher that deals with creating learning environment.

Learning Environment

- Learning environment is the social, physical, psychological, and pedagogical contexts in which learning occurs and which affect student achievement and attitudes (Fraser, n.d.).
- In this study, learning environment refers to an environment experienced or perceived by teachers that supports positive learning outcomes. Creating an effective learning environment involves creating a physical learning environment, a social learning environment and a pedagogical learning environment.

Theoretical Framework of the study

Teachers' Pedagogical Knowledge

Pedagogical knowledge is a generic form of knowledge that involves in all issues of students' learning, classroom management, lesson plan development and implementation, and student evaluation. It includes knowledge about techniques or methods to be used in the classroom; the nature of the target audience; and strategies for evaluating student understanding. A teacher with deep pedagogical knowledge understands how students construct knowledge and acquire skills; develop habits of mind and positive dispositions towards learning (Koehler, 2011).

Pedagogical knowledge includes generic knowledge about how students learn, teaching approaches, methods of assessment and knowledge of different theories about learning (Harris et al., 2009; Shulman, 1986, cited in Wikipedia, 2012).

According to McNell and Wiles (1990), pedagogical knowledge, the principles and practices of teaching, is essential to the teacher. It incorporates the ability to plan lessons and units, to organize and manage the classroom, to use teaching strategies effectively and to test and grade students.

Physical Learning Environment

Studies about student academic achievement and building condition conclude that the quality of the physical environment significantly affects student achievement. "There is sufficient research to state without equivocation that the building in which students spends a good deal of their time learning does in fact influence how well they learn" (Earthman, 2004, cited in Victorian Institute, n.d.).

A teacher has a responsibility for creating a space that reflects the learning goals of the work space, the personality, interests, and age of the students who learn there, and to create a space that is a comfortable and productive learning environment for all (Paula Rutherford, n.d, cited in Victorian Institute, n.d.). The physical environment directly influences teachers' and students' attitudes and their ability to perform. The teacher should assess the room arrangement and consider the following:

- Create enough space to move easily move throughout the classroom.
- Arrange desks to support the task at hand. For example, use clusters for group work and rows for test taking.
- Create an attractive, aesthetically pleasing environment by making sure the room is clean and uncluttered.
- Put up posters, pictures, and projects that reflect students' backgrounds, activities, and accomplishments.
- Post daily schedules in a place where students can read them easily.

According to Jones (2007) and Savage (1999), the classroom environment has proven to change and influence behaviors among students. The design of the classroom allows for some activities to take place and for others to not. It is important that teachers take into consideration the influence their classroom arrangement that can make on their students.

According to Julie McLaughlin (n.d.), every teacher knows that a safe, clean, comfortable and attractive classroom can stimulate learning and help build a classroom community. But for many teachers, setting up the physical environment of their classrooms can be quite daunting, especially when faced with older buildings, crowded classrooms and an insufficient storage space.

The research on classroom environments suggests that classrooms should be organized to accommodate a variety of activities throughout the day and to meet the teacher's instructional goals (Savage, 1999; Weinstein, 1992, cited in Kaser, n.d.). In addition, the classroom should be set up to set the stage for the teacher to address the academic, social, and emotional needs of students (MacAulay, 1990, cited in Kaser, n.d.).

The physical environment has both a direct and indirect influence on the kind of learning that takes place. Many on otherwise well-planned lesson has failed because of the environment. According to Cain and Evans (1984), there are three areas in the physical learning environment that the teachers take into consideration. They are:

1. Physical Factors – lighting, room temperature, desk size, and distracting noises and sights
2. Classroom arrangements – physical furnishings and grouping of students
3. Organization and storage of materials and equipment.

However important physical arrangement of the classroom is, the heart and soul of science teaching is classroom management. Even if the teacher has a well thought out science program, a carefully planned physical classroom, and adequate supplies, the one thing that can wreck his teaching is faulty classroom management, sometimes called discipline (Carin and Sund, 1985).

Effective classroom management is an important part of teaching. It involves a set of complex behaviors used to promote and maintain a proper environment in the classroom so that effective instruction can occur. Management and instruction go hand in hand; effective management is essential to doing a good job of instruction (Carin and Sund, 1985). According to Hoy & Hoy (2006), the aim of classroom management is to maintain a positive, productive learning environment, relatively free of behavior problems. Effective classroom management is an important part of teaching. It involves a set of complex behaviors used to promote and maintain a proper environment in the classroom so that effective instruction can occur. Management and instruction go hand in hand; effective management is essential to doing a good job of instruction. So, the teachers should: Organize Routine Activities,

Keep Contact with Students during a Lesson
Give Encouragement and Praise
Introduce Rules of Conduct
Control Noise Levels.

Social Learning Environment

A social learning environment is a place where individuals can work and learn together collaboratively (both formally and informally) with others - in course groups, study groups or in project and team spaces (Hart, 2009).

Recent research has indicated that the various dimensions of the classroom social environment are separate, can be measured quickly and reliably, and relate significantly to students' motivation, self-regulated learning, classroom behavior (both positive and negative), social relationships, and achievement (Patrick & Ryan, 2003).

The emphasis on the importance of the classroom social environment, including support, mutual respect, task-related interaction among students, and a lesser focus on competition among students, is apparent in reform recommendations. For example, the National Science Education Standards include explicit reference to teachers creating a social and intellectual environment with support, respect, and collaboration as central features (National Research Council, 1996, cited in Patrick & Ryan, 2003).

Vygotsky (1962), a Russian teacher and psychologist, first stated that we learn through our interactions and communications with others. Vygotsky (1962) examined how our social environments influence the learning process. He suggested that learning takes place through the interactions students have with their peers, teachers, and other experts. Consequently, teachers can create a learning environment that maximizes the learner's ability to interact with each other through discussion, collaboration, and feedback (Neff, n.d.).

Cooperative learning is a type of structured peer interaction emphasizing positive human relationships, collaboration between peers, active learning, academic achievement, equal participation, and equal status of students in the classroom (Kagan, 1999).

According to Dr. Spencer Kagan (1999), cooperative learning also increases one's self-esteem, social skills, and study skills. It teaches student empathy and builds social relationships. It not only makes a student like the school, class, lesson plans, the teacher but also teaches them to be more responsible, creating a sense in them that they do make a difference.

Moreover, in working in groups students learn to work with and understand others who differ from themselves.

Teachers also need to know about parental involvement in children's education in order to contribute to students' development and growth effectively. According to White (2009), a key to children doing well in school is for parents to be involved in their education. Research shows students achieve more in school when their parents are engaged in their education. Children whose parents are involved generally have higher grades and test scores as well as more positive attitudes and behaviors.

Pedagogical Learning Environment

A pedagogical learning environment makes students more interactive in the learning process. This environment lets students collaborate among them in order to construct their knowledge as much as possible and to find solutions of many problems that occur during learning (Balla, 2009).

Teaching science is very important because it is a part of our daily life. Everything we do in life and deal with has to do with science (Rios, 2009).

Science instruction becomes more relevant to students when it is taught within the context of everyday life along with what takes place in the science laboratory. Science course content must include practical as well as theoretical ideas if it is to be meaningful to students. Instruction that focuses on student interest, common events, invention and social problems can make science courses more useful to young people, which in turn may make them more interested in science and technology (Collette and Chiappetta, 1989).

Science should be taught so that students can view it as a dynamic activity rather than a static, uninteresting enterprise. Science instruction should not be limited to common, routine instructional activities-lecture, cookbook laboratory exercise, and testing. It should involve inquiry activities that go beyond classroom walls to give students a broader view of science and make science more meaningful and exciting (Collette and Chiappetta, 1989).

To be successful in science teaching, teachers must be able to make their oral presentations interesting and meaningful to their students. The science teacher must be sensitive to how students receive the information he conveys through the lecture method. Students can receive information either by rote or in a meaningful way (Ausubel, 1961, cited in Collette and Chiappetta, 1989).

Some teachers think the lecture method is an efficient way to teach a large group of students. Lectures must be well-planned, well-delivered, and of limited duration. Teachers who use the method well are those who deliver short, effective presentations. Lectures that lost an entire class period can cause students to be inattentive, bored, and mischievous, resulting in classroom management problems.

Teaching science through inquiry provides students opportunities to develop a knowledge base that they construct through their own efforts (Collette and Chiappetta, 1989). The Five E instructional model progresses through five phases that begin with the letter "E": engage, explore, explain, elaborate, and evaluate. inquiry and inquiry-based strategies are vital for increasing elementary school students' love and enthusiasm for science. These methods encourage and enhance their natural curiosity and motivation for learning and connect science to students' everyday life. Inquiry and inquiry-based strategies helps students to develop a deeper understanding of science and create new scientific discoveries (Bybee et al., 2006, cited in Spencer and Walker, n.d.)

Effective teaching requires teachers to check continuously the development of students' understanding and give detailed positive feedback in order to make sure that students correctly integrate new knowledge into the existing knowledge structure (Ducan & Dunn, 1988). According to Carin & Sund (1985), there are three main types of evaluation approaches: diagnostic, formative and summative.

Methodology

Sample

This study investigated the lower secondary science teachers' pedagogical knowledge for creating a learning environment in the selected schools in Kyaiklat Township, Ayeyarwady Region. A convenience random sampling method was used in selecting the sample. (110) lower secondary science teachers from (30) Basic Education Schools in Kyaiklat Township were requested to participate in this study.

Instrumentation

Research instrument is a tool for gathering data concerning the research focus. The instrument was conducted based on the review of related literature. This instrument including indicators was developed to assess the lower secondary science teachers' pedagogical knowledge for creating a learning environment. The questionnaire was divided into two parts. The first was to collect the demographic information concerning gender, age, rank, education level, school, teaching experience, class and subject he or she teaches, subjects they can teach well and training course they have attended. The second included pedagogical knowledge indicators: 34 true-false items, 6 multiple-choice items and 5 open-ended questions.

Before pilot study, instrument was reviewed by a panel of experienced teachers. For the questionnaire validation, the advice and guidance were taken from teacher educators who had special knowledge and experience in this field of study. Teacher educators were from Yangon University of Education. They were a Professor, three Lecturers, and five Assistant Lecturers from the Department of Educational Theory, Yangon University of Education. Questionnaires were distributed to these teacher educators on 3rd January, 2013. And then, the items were modified in accordance with the result of teacher educators' responses.

The modified instrument was used to find out the reliability in the pilot study by investigating (20) lower secondary level teachers. To measure the reliability of questionnaire, the Split-half method was used. In the pilot study, the internal consistency of the questionnaire was 0.88.

Procedure

First and foremost, relevant literature was explored. Next, the instrument was constructed in order to collect the required data. The pilot study was undertaken to refine the developed questionnaire. The pilot produced evidence of the validity and reliability of the measure. After receiving the permission from the Director General of DBE-1 (Department of Basic Education No.1) to do the research in Kyaiklat Township, Ayeyarwady

Region, (110) sets of questionnaire were distributed to lower secondary science teachers in Kyaiklat Township on 23rd and 24th January, 2013. After one week later, these questionnaires were recollected and the respondent rate was 100%.

Data Analysis

The Statistical Package for the Social Science (SPSS) version (16) was used to analyze the quantitative data. Descriptive analysis was used to tabulate means and standard deviations for groups of items. Furthermore, the two statistics namely, IPC and MPC values were used to indicate the lower secondary science teachers' pedagogical knowledge for creating a learning environment. IPC refers to the items percent correct attained by all lower secondary science teachers on all items. MPC refers to the average percent correct attained by all lower secondary science teachers on all items.

$$\text{IPC} = \frac{\text{Number of teachers correctly answered the item}}{\text{Total numbers of teachers}} \times 100$$

$$\text{MPC} = \frac{\text{Total IPC values for all items}}{\text{Total Numbers of items}}$$

Scores in the test are used to describe the lower secondary science teachers' pedagogical knowledge for creating a learning environment. The participant teachers will get (1) mark on each item if they can correctly answer. The scoring range for true-false items and multiple-choice items is that the value less than 50% was considered as a little knowledge regarding creating learning environment and the value greater than 50% was considered sound knowledge for creating learning environment. Based on the IPC values, MPC values were calculated. The MPC value formulated the extent of lower secondary science teachers’ pedagogical knowledge for creating a learning environment.

Mean values were used to investigate the differences of pedagogical knowledge regarding creating a learning environment among lower secondary science teachers in terms of their age, teaching service and gender. The level range for the mean percent is that 1% to 49% was considered as ‘unsatisfactory’, 50% to 74% was considered as ‘fairly satisfactory’ and 75% to 100% was considered as ‘satisfactory’.

In open-ended questions, the same responses of each item were collected to investigate the participants' opinions for creating a learning environment. Besides, the number and percentage of each response were calculated to investigate their pedagogical knowledge for creating a learning environment.

This portion has provided the outlines of method and procedure. The next portion will present the research findings from questionnaire survey.

Findings

Quantitative Findings

Findings on the extent of the lower secondary science teachers' pedagogical knowledge for creating a learning environment

To investigate the lower secondary science teachers' pedagogical knowledge for creating a learning environment, the value of IPC for each item and MPC value for each group were calculated. These values formulated the extent of lower secondary science teachers' pedagogical knowledge for creating a learning environment.

Mean Percent Correct (MPC) Values Showing the Extent or Level of Pedagogical Knowledge of Participant Teachers

Contents	MPC (%)	Level
Physical learning environment	93.26%	Satisfactory
Social learning environment	93.11%	Satisfactory
Pedagogical learning environment	81.95%	Satisfactory
Overall	**89.44%**	**Satisfactory**

Scoring Direction: 1%to 49 %= Unsatisfactory, 50 %- 74% = Fairly Satisfactory and 75% - 100% = Satisfactory

The overall MPC value rated by the participant teachers was (89.44%). Therefore, it can be said that the participant teachers had satisfactory level of pedagogical knowledge for creating a learning environment.

The Variation of Pedagogical Knowledge Scores of Lower Secondary Science Teachers Grouped by Age, Teaching Service and Gender

To know the variation of pedagogical knowledge scores of lower secondary science teachers for creating a learning environment, mean values, standard deviations and mean percent values were analyzed.

The Variation of Pedagogical Knowledge Scores of Lower Secondary Science Teachers Grouped by Age (N=110)

Age Groups	Pedagogical Knowledge Score		Level
	Mean (SD)	Mean Percent Value	
***20-29 years* (N=33)**	34.63 (1.85)	86.57%	Satisfactory
***30-39 years* (N=38)**	35.15 (2.42)	87.87%	Satisfactory
***40 years & above* (N=39)**	34.89 (2.09)	87.22%	Satisfactory

Scoring Direction: *1%to 49 %= Unsatisfactory, 50 %- 74% = Fairly Satisfactory and 75% - 100% = Satisfactory*

(30 - 39) years of age group had the highest pedagogical knowledge regarding creating learning environment among the age groups. Besides, (40 and above) years of age group had more pedagogical knowledge than (20 - 29) years of age regarding creating learning environment. Otherwise, (20 - 29) years of age group had the lowest pedagogical knowledge regarding creating a learning environment among the three groups.

The Variation of Pedagogical Knowledge Scores of Lower Secondary Science Teachers Grouped by Teaching Service (N=110)

Teaching Service	Pedagogical Knowledge Score		Level
	Mean (SD)	Mean Percent Value	
***6 years & below* (N=26)**	34.27 (2.03)	85.67%	Satisfactory
***7-12 years* (N=32)**	35.40 (2.09)	88.50%	Satisfactory
***13-18 years* (N=39)**	35.42 (1.74)	88.55%	Satisfactory
***19years & above* (N=28)**	34.50 (2.43)	86.25%	Satisfactory

Scoring Direction: *1%to 49 %= Unsatisfactory, 50 %- 74% = Fairly Satisfactory and 75% - 100% = Satisfactory*

Teaching service (13 - 18) years group had the highest pedagogical knowledge regarding creating a learning environment among the four teaching service groups. Besides, (7 - 12) years of experience group had more pedagogical knowledge than (6 & below) and (19 & above) years of experience regarding creating a learning environment. According to the data presented in this table, (6 & below) years of experience group had the lowest pedagogical knowledge regarding creating a learning environment among the four groups.

The Variation of Pedagogical Knowledge Scores of Lower Secondary Science Teachers Grouped by Gender (N=110)

Gender	Pedagogical Knowledge Score		Level
	Mean (SD)	Mean Percent Value	
***male* (N=9)**	35.89 (1.27)	89.73%	Satisfactory
***female* (N=101)**	34.82 (2.18)	87.05%	Satisfactory

Scoring Direction: 1%to 49 %= Unsatisfactory, 50 %- 74% = Fairly Satisfactory and 75% - 100% = Satisfactory

Male group had more pedagogical knowledge than female group regarding creating a learning environment.

Responses of Open-ended Questions

The lower secondary level science teachers from the selected schools responded the open-ended questions that deal with creating a learning environment. The participant teachers suggested the item dealing with "What opportunities do you create for your students to develop natural curiosity and creative thinking?" that the teacher should:

1. make students participate actively in activity (N = 15, 13.64%)
2. make students do hands-on activities (N = 25, 22.73%)
3. give guidance to students to observe the environment (N = 13, 11.18%)
4. allow students to express their ideas frankly (N = 9, 8.18%)
5. make students manipulate real objects, then create similar things (N = 5, 4.54%)
6. allow students to do teaching aids together (N = 17, 15.45%)
7. give activities based on individual students (N = 2, 1.81%)
8. encourage students' investigation (N = 10, 9.09%)
9. observe the environment with students (N = 1, 0.9%)
10. make students participate in lessons (N = 3,2.72%)
11. accept students' opinions (N = 2, 1.81%)
12. teach students without giving facts directly (N = 2, 1.81%)
13. make students observe the environment, then discuss among groups (N = 5, 4.54%)
14. use child-centered approach (N = 1, 0.9%)

The participant teachers responded the item concerning "How do you create your students to participate actively in teaching science?" that the teacher should:

1. allow students to discuss among groups (N = 20, 18.18%)
2. teach lesson by giving hands-on activities (N = 19, 17.27%)

3. teach by using teaching aids (N = 16, 14.54%)
4. make students observe the environment, then discuss among groups (N = 5, 4.54%)
5. supervise students by giving activities (N = 6, 5.45%)
6. link the lessons with daily lives (N = 21, 19.09%)
7. tell students the aims of teaching science (N = 1, 0.9%)
8. make students participate in lessons (N = 5, 4.54%)
9. find out real objects needed for the lesson with students (N = 3, 2.72%)
10. take real objects into the classroom, then create opportunities to do hands-on activities (N = 6, 5.45%)
11. teach students to get scientific knowledge (N = 1, 0.9%)
12. allow students to manipulate equipments (N = 5, 4.54%)
13. cooperate with students (N = 1, 0.9%)
14. organize competitions and discussion among groups (N = 1, 0.9%)

The participant teachers suggested the item dealing with “How do you create all students to discuss with self-confidence in your classroom?” that the teacher should:

1. make students participate in lessons (N = 6, 5.45%)
2. allow students to express their ideas frankly (N = 19, 17.27%)
3. link the lessons with daily lives (N = 5, 4.54%)
4. make students do experiment (N = 10, 9.09%)
5. make each student participate in the activity (N = 8, 7.27%)
6. accept students’ answers whether they are right or wrong, and give guidance to get correct answer (N = 23, 20.91%)
7. make students discuss in all teaching-learning processes (N = 11, 10%)
8. praise students’ activities (N = 15, 13.64%)

9. create opportunities for students to observe their environment and develop explanations from observation (N = 5, 4.54%)
10. train students to be able to discuss by asking easy to difficult questions (N = 2, 1.81%)
11. treat students fairly (N = 2, 1.81%)
12. make students observe themselves (N = 2, 1.81%)
13. interact with each student (N = 2, 1.81%)

The participant teachers responded the item concerning "How do you create your students who are whispering with each other, not interested in teaching, and gazing outside the classroom to get attention?" that the teacher should:

1. make students participate actively in activity (N = 7, 6.36%)
2. ask questions related to the lessons (N = 32, 29.09%)
3. organize competitions and discussion among groups (N = 13, 11.81%)
4. attract with interested manner (N = 7, 6.36%)
5. teach with humor (N = 5, 4.54%)
6. attract students by telling stories (N = 6, 5.45%)
7. make students stand up at a moment and ask short questions, then tell them to sit down and teach lesson (N = 2, 1.81%)
8. cooperate with students in experiments (N = 3, 2.72%)
9. interact with each student (N = 5, 4.54%)
10. make students do hands-on activities (N = 18, 16.36%)
11. give activities to the students (N = 8, 7.27%)
12. teach lessons to be interested (N = 3, 2.72%)
13. make them discuss the lessons (N = 1, 0.9%)

The participant teachers suggested the item dealing with "How do you perform for students as a scientific facilitator?" that the teacher should:

1. use teaching aids and real objects (N = 12, 10.90%)
2. prepare teaching aids that are consistent with lessons (N = 18, 16.36%)
3. help students' needs (N = 7, 6.36%)
4. guide students to reach the right answer although their expressions are wrong

   (N = 2, 1.81%)
5. link the lessons with daily lives (N = 5, 4.54%)
6. encourage students to increase natural curiosity and creative thinking without teaching textbook only (N = 2, 1.81%)
7. create opportunities for students to investigate themselves (N = 6, 5.45%)
8. help students to get the abilities to observe, think creatively and increase conducting experiments increase (N = 2, 1.81%)
9. collect real objects, scientific books and journals (N = 13, 11.81%)
10. make students read scientific books (N = 6, 5.45%)
11. master in subject matter (N = 14, 12.72%)
12. make students do experiments (N = 9, 8.18%)
13. find out real objects as possible (N = 5, 4.54%)
14. nurture students' abilities to observe the environment to be increased

    (N = 2, 1.81%)
15. cooperate with students in experiments (N = 2, 1.81%)
16. make students observe the school environment (N = 5, 4.54%)

Summary of Findings

According to the quantitative study, the answers for research questions were described as follows:

- To what extent do the lower secondary science teachers possess pedagogical knowledge for creating learning environment?

  According to MPC values, the extent of pedagogical knowledge possessed by the lower secondary science teachers was satisfactory level regarding creating a learning environment.

- What is the variation in the pedagogical knowledge for creating a learning environment in terms of their age groups?

  The variation in pedagogical knowledge of lower secondary science teachers for creating a learning environment in terms of age groups was regarded that (30-39) years of age group had more pedagogical knowledge among three groups.

- What is the variation in the pedagogical knowledge for creating a learning environment in terms of their teaching service?

  The variation in pedagogical knowledge of lower secondary science teachers for creating a learning environment in terms of their teaching service was regarded that teaching service (13-18years) group had more pedagogical knowledge among four groups.

- What is the variation in the pedagogical knowledge for creating a learning environment in terms of gender?

  The variation in pedagogical knowledge of lower secondary science teacher for creating a learning environment in terms of gender was regarded that male group had more pedagogical knowledge than female group.

Conclusion and Discussion

Regarding lower secondary science teachers' pedagogical knowledge for creating a learning environment, the overall MPC value is 89.44% and thus, it can be concluded that the participant teachers had satisfactory level of pedagogical knowledge for creating a learning environment.

According to the participants' age groups, (30-39) years of age group had the highest mean percent value (87.87%) and (20-29) years of age group had the lowest mean percent value (86.57%).Therefore, it is assumed that

(30-39) years of age group had the highest pedagogical knowledge in creating a learning environment than the other two groups.

Among the four teaching service groups of respondents, teaching service (13-18 years) group had the highest mean percent value (85.55%) and teaching service (6 years and below) group had the lowest mean percent value (85.67%). And hence, teaching service (13-18 years) group had the highest pedagogical knowledge among four groups.

According to gender, the mean percent value (89.73%) of male was more than that of female (87.05%). So, male group had more pedagogical knowledge than female group.

Based on the analyses of the survey, the following suggestions were drawn to be effective in creating a learning environment of lower secondary science teachers.

- As the teacher's ability of creating a learning environment is critical element in teaching-learning process, it is necessary to enhance the teachers' pedagogical knowledge for creating a learning environment.
- To improve the teachers' pedagogical knowledge of learning environment, the teacher education system which includes pre-service, induction and in-service training should be reviewed to be more effective and adaptive.
- Teacher educators need to learn what kind of pedagogical knowledge and actual practices that deal with creating a learning environment should be reinforced for the lower secondary science teachers in order to improve students' learning achievement.
- The teachers and policy makers should emphasize teacher training programs in order to strengthen lower secondary science teachers' pedagogical knowledge for creating a learning environment.
- School principals should encourage teachers to see the concept of creating a learning environment as a priority area for student achievement.
- A suitable professional development program should provide for teachers to have a broad knowledge of creating a pedagogical learning environment.
- Teacher educators should collaboratively put effort in developing the teacher manuals which enhance the development of teachers' pedagogical knowledge regarding creating the learning environment.

Need for Further Research

This study intended to study the pedagogical knowledge of lower secondary science teachers for creating a learning environment. The following are recommendations for additional research. In this study, the lower secondary science teachers were sampled from Kyaiklat Township, Ayeyarwady Region. It is necessary to investigate the lower secondary science teachers' pedagogical knowledge for creating a learning environment from schools in other townships, states and regions to represent the whole country.

Moreover, further study should be carried out through the pedagogical knowledge of other levels of teachers. And then, there is a need for further research to investigate the extent to which principals can support teachers to create a learning environment. This study was based on three areas; physical learning environment, social learning environment and pedagogical learning environment in creating a learning environment. Therefore, for the improvement of teacher education system, further studies needed to explore teachers' pedagogical knowledge in different areas of learning environment.

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AN ANALYSIS OF INSTRUCTIONAL LEADERSHIP FOR IMPROVING PRIMARY SCIENCE TEACHING

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Abstract

The purposes of this study are (1) to study the extent of principals' instructional leadership practices perceived by teachers according to demographic data, school level and their knowledge level, (2) to study the extent of teachers' primary science teaching practices according to school level, (3) to study the relationship between principals' instructional leadership practices and teachers' primary science teaching practices, and (4) to reveal the best predictor of instructional leadership practices for primary science teaching. Descriptive method was used in this research. Two sets of questionnaires: questionnaire for principals and questionnaire for teachers were used in quantitative study. In qualitative study, interview, documentation and observation checklists were used. A proportional stratified sampling method was used to select 95 principals and 450 teachers from 10 selected townships in Yangon City Development Area. Among them, 7 principals and 21 teachers were purposively selected for qualitative study. Descriptive statistics, Item Percent Correct (IPC), independent samples *t*-test, one-way ANOVA, post-hoc test by Tukey, the Pearson product moment correlation and multiple regression, and cyclical process were used for the analysis of quantitative and qualitative data. It was found that there were significant differences in principals' instructional leadership practices according to gender, school level, and their knowledge level. a significant difference was found in teachers' primary science teaching practices according to school level. There was an association between principals' instructional leadership practices and teachers' primary science teaching practices. The first predictor of instructional leadership was giving incentives, and the second one monitoring the teaching/ learning process for improving primary science teaching. Qualitative study suggests that school level, extra work loads, and number of teachers may be the main reasons affecting instructional leadership.

Keywords: instructional leadership, science process skills

Introduction

To become the quality of education, school is important because it is about teaching and learning. To become effective teaching, the role of

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principal is very important. Principals play key role in the delivery of quality of instruction. Leading instructional efforts in a school has evolved into a primary role for school principals. In order to meet challenges, principals must focus on teaching and learning to a greater degree than heretofore. Instructional leadership is focused on the quality of teacher practice and creates the conditions for good teaching and teacher learning.

According to Hoy and Hoy in 2006, school leaders are responsible for creating learning organizations. The principal is responsible for developing a school climate that is conducive to providing the very best instructional practices. Thus, it is the principal who forge a partnership with teachers with the primary goal of the improvement of teaching and learning. Principals keep abreast of the latest developments in teaching, learning, motivation, classroom management, and assessment, and share the best practices in area with teachers.

The effectiveness of a school and teachers' performance are largely dependent upon the type of leadership the principal provides. Principals are responsible for the overall operations of their school. In particular, their duties to monitor instruction increased along their responsibilities to help teachers improve their teaching. The principals must lead their school to get high achievement for all students. Education leaders should build their schools' capacity for changes and improvement. The instructional leadership responsibilities of principals are very important to achieve educational objectives of the State and every principal and subject dean needs to become effective instructional leaders.

Besides, one of the aims of Basic Education in Myanmar is to give precedence to the teaching of science capable of strengthening and developing productive forces. So, fostering the development of science education is one of the most challenging and rewarding tasks instructional leaders will have to do in the twenty-first century (Victor, 1989). According to Fitzgerald (2011), teachers are key players in the reinvigoration of science education. Teaching science in primary schools is important as it arouses the curiosity among the children with regards to their surroundings. Thus, to improve primary science teaching, principals' instructional leadership is vitally important.

Purposes

(1) To study the levels of knowledge of principals' instructional leadership for improving primary teachers' science teaching

(2) To study the extent of practices of principals' instructional leadership for improving primary teachers' science teaching

(3) To study the variation on the extent of principals' instructional leadership practices perceived by teachers according to principals' instructional leadership knowledge

(4) To study the levels of knowledge of teachers' primary science teaching

(5) To study the extent of practices of teachers' primary science teaching

(6) To study the relationship between principals' instructional leadership practices and teachers' primary science teaching practices

(7) To investigate the predictors of instructional leadership for improving primary science teaching

Research Questions

(1) What are the levels of knowledge of principals' instructional leadership for improving primary teachers' science teaching?

(2) Are there any significant differences in principals' instructional leadership knowledge depending on demographic data and school level?

(3) To what extent do teachers perceive on the practices of principals' instructional leadership for improving primary science teaching?

(4) Are there any significant differences in principals' instructional leadership practices depending on demographic data and school level?

(5) Are there any significant differences in principals' instructional leadership practices according to their knowledge level?

(6) What are the levels of knowledge of primary teachers' science teaching?

(7) Are there any significant differences between teachers' primary science teaching practices depending on school level?

(8) Are there any relationship between principals' instructional leadership practices and teachers' primary science teaching practices?

(9) What are the predictors of instructional leadership practices for improving primary science teaching?

Definition of Key Terms

Key terms used in this study were enumerated and defined to easily comprehend.

(1) **Instructional leadership** (1) relates to the processes of instruction in which teachers, learners, and curriculum interact, (2) includes those activities taken on by the principal to produce satisfying working environments and conditions for both teachers and students, (3) consists of the actions that a principal takes and tasks that he or she delegates to promote student learning, (4) includes the involvement of teachers in the decision-making process, and (5) incorporates the principal's concern with the factors and conditions within a school that affect student learning, such as class size, quality of curricular materials, and sociological characteristics of the student (Wanzare and Da Costa (2001)).

(2) **Science process skills** are the skills that ensure active student participation, have students develop the sense of undertaking responsibility in their own learning, increase the permanence of learning, and also have students acquire research ways and methods, that is, they ensure thinking and behaving like a scientist (Ostlund, 1992).

Operational Definition

In this study, instructional leadership is operationally defined as the actions that the principals set the school goals and communicate with teachers, monitor the teaching/ learning process, provide opportunities for professional development and give incentives for improving primary science teaching.

Theoretical Framework of the Research

In this study, based on the related literature and research studies of instructional leadership for science education, instructional leadership for improving primary science teaching were classified as four areas:

(1) Setting the school goals and communicating with teachers

(2) Monitoring the teaching/ learning process

(3) Providing opportunities for professional development

(4) Giving incentives

1. Setting the school goals and communicating with teachers: The principals' major roles are in conceptualizing the school's goals, and in framing goals that promote high standard and expectation for all students. They set the goals annually and in collaboration with teachers. Principals frame these goals in term of staff responsibilities for meeting them. They need assessment for staff input. Principals develop these goals that are easily understood and teachers use these goals in the school. They are easily translated into classroom objectives. Principals must communicate a clear vision of instructional excellence and continuous professional development consistent with the goals of the improvement of teaching and learning. They give suggestions to teachers formally and informally for implementing the school goals. They also need to enhance teacher behaviors by distributing professional literature, encouraging teachers to attend workshops and conferences, and encouraging reflective discussions and collaboration with others. The instructional leaders must share with teachers an understanding of instructional goals.

2. Monitoring the teaching/ learning process: Principals should frequently observe classroom instruction in their role as supervisors for improving science teaching. They should also maintain a high level of accountability with respect to classroom instruction. They should work with teachers to insure that classroom objectives are directly connected to school goals and review classroom instruction using as many sources of information as formal and informal classroom observations, lesson plans, and student work products. They need to assist teachers in improving their instructional practices.

Principals should demonstrate teaching techniques in classrooms and during conferences. They must utilize coaching and mentoring. They often use an inquiry approach with teachers, and they frequently ask for the teachers' advice about instructional matters. Principals should actively encourage teachers to become peer coaches. They must work with teachers to help them improve their instructional practice. Principals need to spend time in classrooms as colleagues and engage teachers in conversations about learning and teaching. For improving science teaching, principals must know the objectives of science teaching, and characteristics of effective science teachers.

Principals and teachers should possess the expertise in science, gain innovative idea about teaching strategies, develop mutual respect and trust among their colleagues and change their classroom practices to meet the needs of students. They offer guidance to elementary teachers in planning and integrating effective questions. So they must know Bloom's Taxonomy that identifies the levels of thinking: knowledge, comprehension, application, analysis, synthesis and evaluation. Principals and teachers must ensure that scientific inquiry and the development of science process skills are essential components of instruction, encourage the use of a variety of teaching styles that emphasize constructivist approaches, including differentiated instruction and cooperative learning, encourage the use of student self-assessment in the classroom, regularly communicate progress in student learning to parents and students, and build capacities of principals and teachers to provide instructional leadership in science. Victor (1989) said that it is the duty of the principal to create the school environment as the safe and orderly learning environment supported to students' learning in science. And then, the lack of resources may be a barrier to the use of some instructional strategies by teachers and have a negative effect on the attainment of the students' science process skills.

3. Providing opportunities for professional development: Principals should provide staff development opportunities which address emergent needs for teachers to improve primary science teaching. They frequently become learners themselves by participating in staff development sessions. They should support different approaches to teaching and learning as well as flexibility with regard to teaching elements such as grouping and strategies. Principals must recognize a need to support resources and that new teachers need opportunities to work with more expert teachers as they begin to develop and grow in their teaching. Principals should also promote professional development by praising the teachers' efforts and providing awards to outstanding teachers in science, encouraging teachers to study professional literature for science, giving teachers time for independent studies, and using external sources such as college courses, district/ township-level workshops, and encouraging collaborative relationships. Principals need to create cultures of collaboration, inquiry, and lifelong learning.

Principals need to develop teacher leadership by sharing responsibilities or tasks to teachers and providing opportunities for teachers to become leaders in science instructional activities. According to Glickman, Gordan and Gordan (2009), teachers participate in leadership preparation programs and assist other teachers by assuming one or more leadership roles (workshop presenter, cooperating teacher, mentor, expert coach, instructional team leader, curriculum developer). The teacher leaders assist other teachers and experience professional growth as a result of being involved in leadership activities. Teacher leaders need to benefit schools by increasing expertise in teaching and learning, strengthening collaborative cultures, and increasing teachers' sense of professionalism and empowerment. They should impact student learning by implementing new practices in their own classrooms. Principals as instructional leaders are responsible for cultivating leadership among science teachers.

4. Giving incentives

Principals need to give praise on specific and concrete behaviors of teachers and students. Principals give praise that focuses on behaviors significantly affect teachers' and students' motivation. Giving rewards also fosters teacher reflective behavior, including reinforcement of effective teaching strategies, risk taking, and innovation/creativity (Blasé & Blasé, 1999). Hallinger and Murphy (1986) stated that principals in instructionally effective schools do not leave the task of rewarding students solely to individual teachers; they develop incentives for learning that are school-wide in orientation. Principals find ways to reward or recognize teachers for their efforts. Some of these are informal – private words of praise; others are more formal such as recognition before peers, nomination for awards, or letters to the personnel files of teachers. Principals must reinforce outstanding performance by teachers in staff meeting, reward teachers privately for their efforts, or performance, obviously recognize teachers' noticeable performance and bring about professional learning opportunities for teachers as rewards. Principals and teachers must recognize and give rewards for outstanding students in school assemblies, in holding the Parent-Teacher Association, and in the School Family Day.

This theoretical framework will guide to the following research work.

Quantitative Methodology

Samples

School level was divided into three levels in this study. 58 Basic Education Primary Schools and 5 Basic Education Post Primary Schools were in Level 1, twenty Basic Education Middle Schools were in Level 2, and 11 Basic Education High Schools and one Basic Education Branch High Schools were in Level 3. 95 principals and 450teachers were included in this study by a proportional stratified sampling. 95 Basic Education Schools from 10 townships in Yangon City Development Area were selected to collect the data. There were 73 teachers from the Level 1 schools, 90 teachers from the Level 2 schools, and 287 teachers the Level 3 schools. 95 principals and 450 teachers who teach primary science from those schools were selected in this study.

Instruments

In this study, two main instruments were used to collect the required data. The first instrument was to investigate principals' instructional leadership knowledge for principals. For teachers who teach primary science, the second one was to investigate principals' instructional leadership practices, teachers' primary science teaching knowledge and practices.

Data Analysis

Descriptive statistics, Item Percent Correct (IPC), independent samples *t*-test, one-way ANOVA, post-hoc test by Tukey, the Pearson product moment correlation and multiple regression were used for the analysis of quantitative data.

Qualitative Methodology

Samples

In order to keep the sample size manageable in this study, purposive sampling method was used to choose the participants. The researcher selected purposefully three schools (one primary school, one middle school, and one high school) based on lowest mean score and four schools (two primary schools, one middle school and one high school) based on highest mean score indicated by the results of quantitative data analysis. One principal and three teachers were selected from each school. Twenty-one teachers and seven principals from seven schools involved in this in-depth qualitative study.

Instrumentation

Instruments for qualitative methodology including interviews, observations and documentations were developed based on quantitative instruments.

To investigate principals' instructional leadership practices, the interview question comprised eight items. The observation checklist consisted of nine items to investigate teachers' primary science teaching practices. In documentation form, nine items were included.

Data Analysis

Data analysis was conducted based on categorizing and interpreting the observation, documentation, and interview. The cyclical process was used to analyze the qualitative data.

Research Findings

Quantitative Findings

In the quantitative study, the instructional leadership knowledge level of principals was investigated by using IPC values and scoring range. It was seen that most of the principals had above satisfactory level.

Table 1: Number and Percentages of Principals' Knowledge Level of Instructional Leadership

Percentage of Scoring Range	Number of Principals	Remark
< 50%	1(1.1%)	Below Satisfactory Level
50% - 74%	48 (50.5%)	Satisfactory Level
≥ 75%	46 (48.4%)	Above Satisfactory Level

In table 4.2, 1 (1.1%) of principals were in below satisfactory level, 48 (50.5%) of principals were in satisfactory level, and 46 (48.4%) of principals were in above satisfactory level.

Table 2: Independent Samples *t*-Test Result Showing Principals' Instructional Leadership Knowledge Grouped by Qualification

Variable	Qualification	Mean (SD)	*t*	*df*	*p*
Principals' instructional leadership knowledge	BEd / MPhil / MEd	25.56 (2.19)	2.01	93	.047*
	BA/ BSc	24.67 (2.44)			

* p <.05, ** p <.01, *** p <.001, ns = not significant

In order to analyze and evaluate whether there were significant differences in principals' instructional leadership practices for improving primary science teaching between two groups of principals, an independent samples t-test was utilized. A significant difference in principals' instructional leadership knowledge was found by their qualifications at .047.

Table 3: One-Way ANOVA Result Showing Principals' Instructional Leadership Knowledge Grouped by School Level

Variable	School Level	Mean(SD)	*F*	*p*
Principals' Instructional Leadership Knowledge	Level 1	24.86(2.55)	6.565	.002**
	Level 2	24.50(1.61)		
	Level 3	27.25(1.06)		
	Total	25.08(2.38)		

* p <.05, ** p <.01, *** p <.001, ns = not significant

According to the One-Way ANOVA result in Table 3, a significant difference was found in principals' instructional leadership knowledge among school level.

Table 4: Mean Values and Standard Deviations of Principals' Instructional Leadership Practices

Variables	Mean	SD
Setting the goals and communicating with teachers	2.65	.72
Monitoring the teaching/ learning process	2.90	.78
Providing opportunities for professional development	2.68	.68
Giving incentives	2.68	.82
Total instructional leadership practices	**2.74**	**.64**

In practicing instructional leadership, it was found that principals sometimes performed setting the goals and communicating with teachers, monitoring the teaching/ learning process, providing opportunities for professional development and giving incentives (See Table 4).

Table 5: Independent Samples *t*-Test Result Showing Principals' Instructional Leadership Practices Perceived by Teachers according to Qualification

Variables	Qualification	Mean(SD)	*t*	*df*	*p*
Providing opportunities for professional development	BEd / MPhil /MEd	2.79(.76)	3.746	448	.000***
	BA / BSc	2.55(.57)			

* p <.05, ** p <.01, *** p <.001, ns = not significant

One-way ANOVA was conducted to analyze whether there were significant differences in principals' instructional leadership practices perceived by teachers according to their qualifications. In Table 5, there was a significant difference in providing opportunities for professional development between principals who got BEd / MPhil / MEd Degree and BA/ BSc Degree.

Table 6: One-Way ANOVA Result Showing Principals' Instructional Leadership Practices Perceived by Teachers according to Professional Qualification

Variables	Professional Qualifications	Mean (SD)	F	*p*
Setting the goals and communicating with teachers	PTTC	1.82 (.14)	2.65	.048*
	JTTC	2.65 (.75)		
	DTEC	2.31 (.22)		
	BEd / MPhil / MEd	2.68 (.69)		
Providing opportunities for professional development	PTTC	2.36 (.28)	4.34	.005**
	JTTC	2.56 (.58)		
	DTEC	2.44 (.29)		
	BEd / MPhil / MEd	2.78 (.76)		

* p <.05, ** p <.01, *** p <.001, ns = not significant

Table 6 indicated the one-way ANOVA result that principals' instructional leadership practices for improving primary science teaching according to the professional qualifications they attended. There was no significant difference in instructional leadership practices according to the professional qualifications principals attended.

Table 7: One-Way ANOVA Result Showing Principals' Instructional Leadership Practices Perceived by Teachers according to School Level

Variable	School Level	Mean(SD)	*F*	*p*
Total Principals' Instructional Leadership Practices	Level 1	2.77(.62)	8.291	.000***
	Level 2	2.51(.69)		
	Level 3	2.89(.62)		
	Total	**2.74(.64)**		

* p <.05, ** p <.01, *** p <.001, ns = not significant

A one-way ANOVA test was conducted to analyze the differences among school level. As shown in Table 7, a significant difference was found among school level concerning principals' instructional leadership practices.

Table 8: One-Way ANOVA Result Showing Principals' Instructional Leadership Practices Perceived by Teachers according to their Knowledge Level

Variables	Groups of principals	Mean(SD)	F	*p*
Total instructional leadership practices	Group 1	**2.62 (.29)**	3.631	.027**
	Group 2	**2.72 (.66)**		
	Group 3	**2.769 (.64)**		

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, ns = not significant
Group 1= group of principals in below satisfactory level
Group 2= group of principals in satisfactory level
Group 3= group of principals in above satisfactory level

A one-way ANOVA result showed that a significant difference was found in principals' instructional leadership practices perceived by teachers according to their knowledge as shown in Table 8.

Teachers' primary science teaching knowledge was investigated by using IPC values and scoring range. It was found that a few teachers' primary science teaching knowledge had above satisfactory level.

Table 9: Number and Percentage of Teachers Showing their Level of Knowledge on Primary Science Teaching

Percentage of Scoring Range	Number of Teachers	Remark
< 50 %	321 (71.3 %)	Below Satisfactory Level
50 %-74 %	127 (28.2 %)	Satisfactory Level
≥75 %	2 (0.4 %)	Above Satisfactory Level

As shown in Table 9, 321 (71.3%) teachers were in below satisfactory level. 127 (28.2%) teachers were in satisfactory level and 2 (0.4%) of teachers were in above satisfactory level.

Table 10: One-Way ANOVA Result Showing Teachers' Primary Science Teaching Practices by School Level

Variable	**School Level**	**Mean (SD)**	**F**	***p***
Teachers' primary science teaching practices	Level 1	2.62 (.56)	6.465	.002**
	Level 2	2.40 (.58)		
	Level 3	2.69 (.65)		

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, ns = not significant

According to the one-way ANOVA result in Table 10, there was a significant difference in primary science teaching practices of teachers by school level.

The Pearson-product moment correlation was utilized to find out the relationship between principals' instructional leadership practices and teachers' primary science teaching practices. In Table 11, the Pearson Correlation coefficient is .559; the significant level is .000. It was seen that there is an association between principals' instructional leadership practices and teachers' primary science teaching practices.

Table 11: Relationship between the Principals' Instructional Leadership Practices and Teachers' Primary Science Teaching Practices

	ILP	TP
Principals' instructional leadership practices (ILP)	1	.559**
Teachers' primary science teaching practices (TP)	.559**	1

**. Correlation is significant at the 0.01 level (2-tailed).

Table 12: Means, Standard Deviations and Inter-correlations for Science Teaching Practices and Predictors

Variables	Mean (SD)	SGCT	MTLP	POGD	GI
Primary Science Teaching practices	2.69 (.63)	.401***	.524***	.462***	.525***
Predictor Variables Setting the school goals and communicating with teachers	2.66 (.71)	----	.66***	.52***	.64***
Monitoring the teaching/ learning process	2.91 (.79)		----	.67***	.71***
Providing opportunities for professional development	2.69 (.69)			----	.67***
Giving incentives	2.69 (.83)				----

* $p < 0.05$, ** $p < 0.005$, *** $p < 0.001$, ns = not significant

The beta coefficients were presented in Table 13. Monitoring the teaching/ learning process and giving incentives significantly predict science teaching practices when all four variables were included. The adjusted R squared value was .26. This indicated that 26% of the variance in science teaching practices was explained by the model. According to Cohen (1988), this is a large effect.

Table 13: Simultaneous Multiple Regression Analysis Summary for Factors Predicting Science Teaching Practices

Variables	B	SEB	β
Setting the school goals and communicating with teachers	.026	.051	.003
Monitoring the teaching/ learning process	.164	.054	.261**
Providing opportunities for professional development	.059	.055	.105
Giving Incentives	.206	.050	.268**
Constant	1.274	.103	

$R = .508$, $R^2 = .26$; $F(4, 445) = 38.632$

* $p < 0.05$, ** $p < 0.005$, *** $p < 0.001$, ns= not significant

Qualitative Findings

In the qualitative study, classroom observation, interview and documentation methods were used to be perfect the data obtained from the quantitative study.

All principals take their teachers' advice and suggestions and allow teachers to give advice and suggestions in setting the school goals. 5 (71.42%) of principals discuss with primary teachers about their teaching based on students' exam results, primary science teaching objectives, how to teach and implement primary science teaching for the whole academic year. Most of the principals supervise classroom teaching.

There was no record about classroom observation. Some principals give support teachers to make needed teaching aids. Most of the principals just hold the board of study monthly. Some books are provided for teachers. Most of the teachers discuss the teaching/ learning activities informally. Four principals give teachers rewards due to their outstanding practices in school meetings and the Parent-Teacher Gathering annually.

Most of the teachers ask the previous knowledge. All of the teachers use question and answer method. Half of the teachers use the appropriate teaching aids. Some teachers ask questions during the teaching. Most of the teachers use summative tests at the end of teaching period. A few teachers finish their teaching by winding up the lesson.

Discussion

Alimuddin (2010) stated that the responsibility of the principal as an instructional leader is to ensure that teaching-learning and academic activities are planned and implemented well, conducted in a good and orderly manner and carry out academic management in order to help teachers teach effectively (cited in Abdullah and Kassim, 2012). Leithwood and Prestine (2002, cited in Sherman and MacDonald (2008)) stated that principals must analyze the way they encourage teachers to think critically about their teaching and assessment approaches for students.

The findings of this study highlighted that there was a strong correlation between the principals' instructional leadership practices in their school and teachers' primary science teaching practices. However, it was found that most of the principals perform instructional leadership practices to some extent. Through the results of interview and open-ended responses, major problems of why those principals put less emphasis on instructional leadership practices such as too much clerical work, insufficient teachers, no enough time to study, and financial support were also analyzed.

In setting the school goals for improving primary science teaching, it is important that the principals must communicate and cooperate with teachers. In the findings of quantitative questionnaires, principals can be assumed to establish the school goals to improve the students' exam pass-rate. But, setting the goals to develop students' science process skills was rarely found. Hallinger and Murphy (1986) stated that the principal can communicate school goals by referring to them often and in a variety of school contexts. On the other hand, teachers should be allowed to participate in setting the school goals, and the formulated goals needed to be clearly communicated with teachers. Most of middle school principals were also found that they put little stress on setting the goals and communicating with teachers than any other middle and high school principals do. To run a school smoothly, setting the school goals is of vitally importance. In qualitative findings, there was no objective for improving students' science process skills. In implementing these goals, the principals should give the needed suggestions and advice to science teachers. According to Hallinger and Murphy (1986), the principal plays a key role in framing goals in such a way that they are easily translated into classroom objectives. Weber in 1987 stated that an instructional leader must attend to each of these levels of objectives (from the school to each unit), reviewing and monitoring them for consistency and relevance. Therefore, it is important that principals and teachers should lay down the classroom objectives that are consistent with the school goals. The principals should evaluate whether teachers' teaching practices are congruent with the objectives they laid down or not.

In the findings, principals' practice in monitoring the teaching/ learning process was in satisfactory level. Hallinger and Murphy in 1986 stated that principals review classroom instruction through formal and informal classroom observations, and lesson plans. Therefore, principals should examine the teachers' lesson preparation consistent with the school goals they set. In order to know whether the teachers' practices are congruent with the objectives or not, principals should perform classroom observation carefully. Glickman, Gordan and Gordan (2009) described that the supervisor can use official records of classroom observation to assess need of teachers' primary science teaching. Weber (1989) stated that principals themselves should make a list of classroom observation for improving instruction. So, principals should have the records of classroom observation. According to Hallinger and Murphy (1986), principals need to offer concrete suggestions to teachers and assist them in improving their instructional practices. In findings, principals gave the necessary advice to teachers and support the needed teaching aids (books and materials) for improving primary science teaching. Moreover, principals should arrange to keep a safe learning environment for the students. In quantitative finding, high school principals mostly practiced monitoring the teaching/ learning process. Since monitoring the teaching/ learning process is very conducive to giving concrete suggestions to teachers, this practice should not be ignored. In qualitative findings, middle school principals placed little emphasis on supporting teaching aids for improving primary science teaching and on giving instruction that evaluation of the students' understanding is relevant with the lesson objectives. According to the documentation result, records of classroom observation were not found in most schools. In fact, every school should keep those records and arrange them to be available for teachers in order to reflect their primary science teaching practices. As one more important thing for an instructional leader, Hallinger and Murphy (1986) described that principals can increase student learning opportunities by reducing interruptions in their classroom and by working with teachers to develop more effective classroom management practices. Therefore, principals should arrange science teaching period free from interruptions, and should manage to get enough time for science teaching.

Principals' practice in providing opportunities for professional development (reflecting teaching, attending seminars, etc.) was at the satisfactory level. In quantitative findings, middle school principals' practice in providing professional development was higher than those of any other principals. But, in qualitative findings, middle school principals put less emphasis on providing professional development although high school principals emphasized providing professional development. As the primary school principals, they informally perform providing professional development. According to Sherman and MacDonald (2008), a good instructional leader will encourage teachers to be engaged in professional development and focused on self-reflection. Therefore, the more teachers are encouraged to reflect their teaching, the more they convince that what their strengths and weaknesses are in their teaching. Hallinger and Murphy (1986) stated that principals work with teachers directly by conducting in-service workshops for their staff and by working in the classroom with teachers who are learning new skills. They need to arrange for teachers to observe their colleagues' teaching. So, principals should try teachers to attend workshops and in-service training. Teachers should observe their teaching mutually. And then, principals should provide teaching resources (books, journals, etc.) to teachers for their professional development. Abdullah and Kassim (2012) described that principals need to promote the professional development of teachers by allocating time in the meeting to share ideas, and provide professional development opportunities. Principals should arrange the time to share ideas for teachers by holding the board of study for science teaching. In the board of study for science, principals should attempt to discuss the literature related to science teaching with teachers and share the knowledge they get from in-service training courses.

Principals' practice in giving incentives was in satisfactory level. In quantitative findings, high school principals mostly perform giving incentives than any other schools do. In qualitative findings, high school principals and primary school principals gave rewards for teachers who take part in the selecting examinations of outstanding teachers. And then, if those teachers received prize, principals gave recognition to teachers in front of their colleagues as well. But, middle school teachers put less emphasis on giving incentives. Hallinger and Murphy in 1986 stated that principals as instructional leaders provide incentives to individual teachers in order to improve their teaching practices and find ways to reward or recognize teachers for their efforts informally and formally. Thus, principals should give recognition to teachers' efforts to improve primary science teaching. Weber (1989) described that rewards and recognitions not only add to motivation but also enhance the effort. Blasé and Blasé (1999) stated that praise significantly affected teacher motivation, efficacy, and creativity. Sherman and MacDonald in 2008 described that good instructional leaders praise effective teaching. Therefore, principals should give recognition to teachers' outstanding efforts. Teachers should be believed that they could teach students to understand well. Principals should choose and recommend teachers for the scholarship program based on their outstanding performances.

In the findings of knowledge about instructional leadership, there were a lot of principals who were above satisfactory level. But it was not found that principals did not perform instructional leadership practices as equal with their knowledge of instructional leadership. Because of too much clerical work, less financial support and insufficient teachers, they could not practice instructional leadership well. Results reflected that there were significant differences in principals' instructional leadership knowledge and practices depending on demographic data and school level. Findings showed that there were significant differences in principals' instructional leadership knowledge and practice in providing professional development depending on qualification. The result of the research findings indicated that the groups of principals who got the BEd/ MPhil/ MEd Degree had much knowledge about instructional leadership than those of principals who got the BA/ BSc Degree. The practice in providing professional development of the groups of principals who got the BEd/ MPhil/ MEd Degree was better than that of principals who got the BA/ BSc Degree. Thus, the findings highlighted that the principals need to get the educational degrees as much as possible. There were significant differences in principals' instructional leadership knowledge depending on school level. High school principals had much knowledge about instructional leadership than that of primary and middle school principals. The findings pointed out that most of primary and middle school principals should get chances as high school principals do.

According to the findings, there were significant differences in principals' practices, setting the goals and communicating with teachers and providing opportunities for professional development, depending on professional qualification. It is apparent that professional qualification highly affects principals' instructional leadership practices.

The results showed that there were significant differences in principals' instructional leadership practices depending on their knowledge. Therefore, it is important to get much knowledge about instructional leadership. In order to get a lot of knowledge, principals should attend the educational trainings as much as possible.

According to the findings, there were a few teachers who were in above satisfactory level of knowledge about primary science teaching. In classroom observations, it was found that a few teachers apply appropriate teaching aids, and gave students opportunities to learn science by using their science process skills.

Thus, it can be concluded that systematically designed professional development activities are vitally important for the development of teachers' knowledge about primary science teaching. In the findings, there were significant differences in teachers' primary science teaching practices depending on school level. High school principals assign junior teachers to help primary science teaching when their schools do not have enough primary teachers. But, primary school primary had difficulties in arranging that practice because they do not have other teachers to get support. Because of this, science teaching practices of primary teachers in high schools are higher than those of primary teachers in primary and middle schools. Thus, principals' instructional leadership practices are important.

Findings suggested that there was an association between principals' instructional leadership practices and teachers' primary science teaching practices. Thus, principals need to perform succinctly, effectively and systematically arranged instructional leadership activities for improving teachers' primary science teaching practices.

Recommendations

It is essential to enhance principals' instructional leadership practices so that they can give their teachers detail instructions for improving their science teaching practices. As instructional leaders, principals need to allow teachers to make decisions and participate in setting the school goals. Principals should supervise teachers' setting classroom objectives to be in-lined with the objectives for improving the students' science process skills.

Principals need to supervise teachers' primary science teaching in accordance with the objectives they laid down. Principals should have classroom observation records in order to know how teachers use approaches for improving science process skills. Principals need to give suggestion to teachers about their science teaching.

Principals should try to provide teachers the necessary teaching aids and should urge the teachers to create new teaching aids on their own. Principals should encourage teachers to reflect about their science teaching. Principals should try and force teachers to attend workshops, seminars, and in-service trainings concerning science teaching skills. Principals should arrange the time and place for teachers to share ideas and knowledge from in-service training with their colleagues and discuss the literature they read. Principals should arrange plans to be able to invite the science teaching experts from outside so that those experts are able to lecture the teachers. Principals should provide recognitions to teachers for participating in the contest of creating teaching aids, and outstanding performance in science teaching. Principals should give praise and rewards to teachers individually, in the meetings, and in the parent-teacher gatherings. Principals should arrange teachers to attend the educational programs for improving their science teaching. Too much extra workloads that can waste energy and time for instructional leaders should be reduced as much as possible so that principals can perform instructional leadership practices well, specifically and systematically.

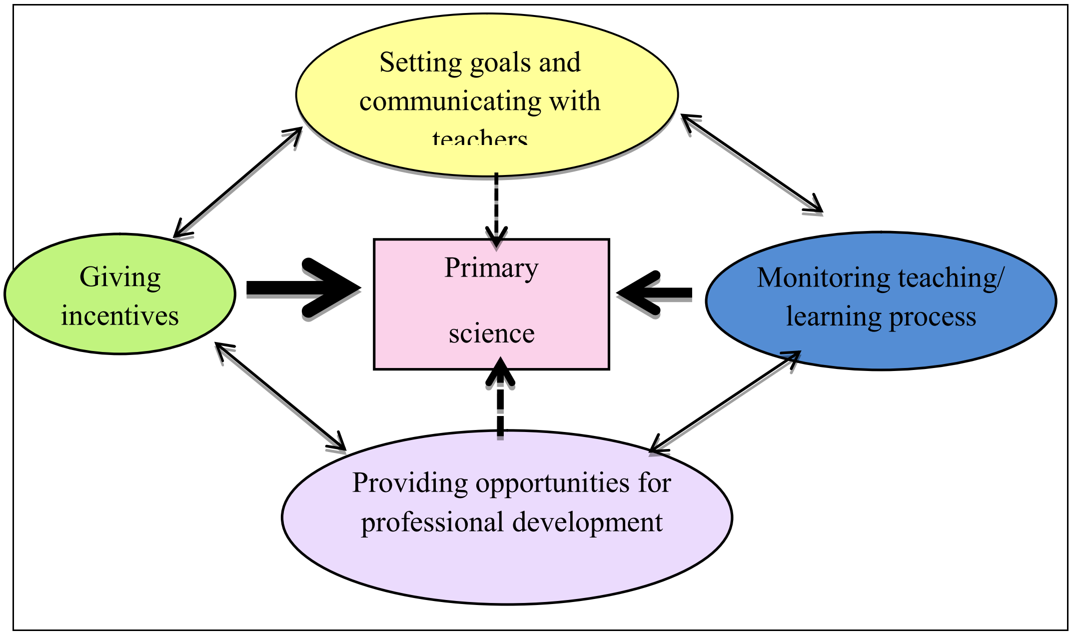

Figure 1: Proposed Model of Instructional Leadership for Improving Primary Science Teaching

Inter-correlation between two coponents (statistically significant)

Predicting on primary science teaching practices (not significant)

Predicting on primary science teaching practices (statistically significant)

Need for Further Research

This study tried to explore the analysis of instructional leadership for improving primary science teaching. Besides, instructional leadership practices were investigated based on demographic data, school level and principals' instructional leadership knowledge. And then, the predictors of instructional leadership practices were also investigated in this study.

The samples of this study were principals and teachers who were only from Yangon City Development Area. It is necessary to investigate principals' instructional leadership practices for improving primary science teaching in other states and regions to represent the whole country.

In addition, since this study examined the instructional leadership for improving primary science teaching identifying the four dimensions, exploring the factors affecting principals' instructional leadership practices would be recommended as further studies.

Acknowledgement

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A STUDY OF THE MANAGEMENT STYLES OF HEADMISTRESSES AND JOB SATISFACTION OF TEACHERS IN BASIC EDUCATION HIGH SCHOOLS

Phyo Thida [1] & Thet Naing Oo [2]

Abstract

The main aim of this study was to study the management styles of headmistresses and job satisfaction of teachers in Basic Education High Schools, Insein Township, Yangon Region. The specific aims were to study the management styles of headmistresses, to identify the level of teachers' job satisfaction, to investigate the variations of teachers' job satisfaction in terms of personal factors and to investigate the relationship between the management styles of headmistresses and job satisfaction of teachers.

Quantitative and qualitative methods were used in this study. The headmistresses who had served at least for 2 years in the current school were selected by using purposive sampling. 186 teachers (including JTs and STs) from Basic Education High Schools in Insein Township were randomly selected as participants. Managerial Grid Questionnaire by Blake and Mouton and Teacher Job Satisfaction Questionnaire (TJSQ) by Lester were used as an instrument. The reliability coefficient Cronbach's alpha (α) of headmistresses' management styles was 0.89 and the reliability coefficient Cronbach's alpha (α) of teachers' job satisfaction was 0.81. The Statistical Package for the Social Sciences (SPSS) software version 20, Descriptive statistics, One-way ANOVA, independent samples *t* test and Pearson Correlation were used to analyze the data obtained in this study.

The research findings showed that dominant management style of headmistresses was team management style. And it was found that teachers were moderately high satisfaction level in their job. There were significant differences in some items of the job satisfaction of teachers grouped by position and years of teaching service. However, there was no significant difference among groups of teachers grouped by qualification. According to the data obtained by quantitative methods, headmistresses' people-oriented management style and task-oriented management style were moderately correlated with job satisfaction of teachers.

Keywords: Management Styles, Job Satisfaction

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Aims of the Study

The aims of this study are as follows.

Main Aim

The main aim of this study is to study the management styles of headmistresses and the level of job satisfaction of teachers.

Specific Aims

(1) To study the management styles of headmistresses.

(2) To identify the level of teachers' job satisfaction.

(3) To investigate the variations of teachers' job satisfaction in terms of personal factors.

(4) To investigate the relationship between the management styles of headmistresses and job satisfaction of teachers.

Research Questions

(1) What is the dominant management style of headmistresses?

(2) What is the level of teachers' job satisfaction?

(3) What are the variations of teachers' job satisfaction in terms of personal factors?

(4) Is there any relationship between the management styles of headmistresses and job satisfaction of teachers?

Theoretical Framework

Managerial Grid: In attempting to study the management styles of headmistresses, Managerial Grid Questionnaire developed by Blake and Mouton was used in this research. The questionnaire consists of two dimensions about management style. These two dimensions are the "concern for people" and "concern for task". This questionnaire has 18 items of which 9 items determine a principal's people oriented statement and 9 items determine principal's task oriented statement. Each statement includes a six-point Likert scale (From never=0 to always=5). In order to determine the headmistresses' management styles, each teacher's answer from each school will be transferred to a scoring section as shown below.

People Statement	Task Statement
1.---------	10.---------
2.---------	11.---------
3.---------	12.---------
4.---------	13.---------
5.---------	14.---------
6.---------	15.---------
7.---------	16.---------
8.---------	17.---------
9.---------	18.---------
TOTAL.---------	TOTAL.---------
× 0.2= **---------**	×0.2= **--------**

Figure 1.1: The Scoring Section (from Blake and Mouton's Managerial Grid)

Once the final score is calculated, they will be plotted on the graph below by drawing a horizontal line from the approximate people score (vertical line) to the right of the matrix, and drawing a vertical line from the approximate task score on the horizontal axis to the top of the matrix. Then, two lines are drawn from each dot until they intersect. The area of intersection is the management style that every headmistress practices (Vgrovic & Pavlovic, 2014). The managerial grid model contains management styles as follows:

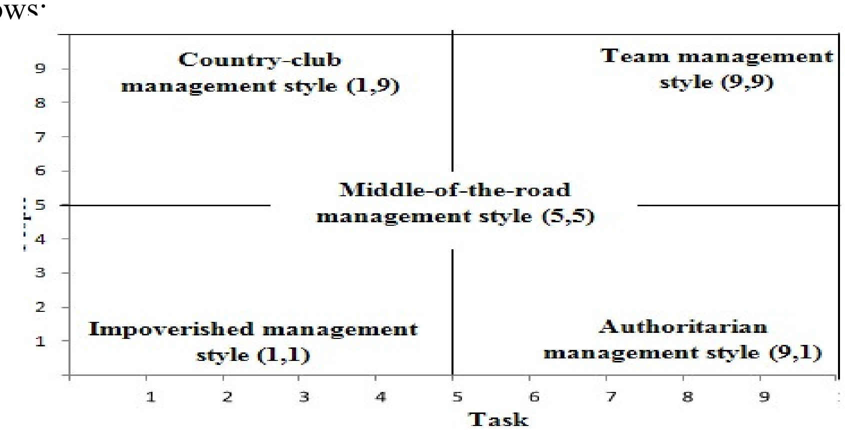

Figure 1.2: Blake and Mouton's Managerial Grid

Source: Hersey, P. & Blandchard, K.H. (1993). *Management of Organizational Behaviors* (6 th ed.). United State of America: Prentice-Hall International Editions.

Teachers' Job Satisfaction: To investigate the teachers' job satisfaction, Lester's Teacher Job Satisfaction Questionnaire (TJSQ) was used to assess the level of teachers' job satisfaction in this research. This questionnaire contains nine dimensions to investigate teachers' job satisfaction. They are pay, supervision, working conditions, colleagues, responsibility, work itself, career advancement, security and recognition. The questionnaire has 37 items. It was decided to use four-point Likert scale (not highly satisfied=1 to highly satisfied=4).

Definitions of Key Terms

(a) Management

According to Follet, management is the art of getting things done through people. Management involves establishing overall purpose and policy, forecasting and planning for the future, organizing work, allocating duties and responsibilities, giving instructions or orders, controlling and checking the performance according to a plan and coordinating the work of others (Hucnzynski & Buchanan, 1991).

(b) Management Style

According to Schleh (1977), management style is a preferred way of managing people in order to bind diverse operations and functions together, as well as to exercise control over the employees, and is considered as a set of practices that has been adopted either by an individual, a department, or whole organization (cited in Nwadukwe & Timinepere, 2012).

(c) Job Satisfaction

According to Locke (1976), job satisfaction is a pleasure or positive emotional state resulting from the appraisal of one's job or job experience (cited in Sempane, Rieger & Roodt, 2002).

Review of Related Literature

Definitions of Management

Management is the process of working with and through individuals and groups and other resources to accomplish organizational goals (Hersey & Blandchard, 1993).

Management is the process of planning, organizing, directing and controlling organizational behaviours in order to accomplish a mission through the division of labor (Wagner III & Hollenbeck, 1995).

Managerial Functions

1. ***Planning:*** Planning is a forward-looking process of deciding what to do. Managers who plan try to anticipate the future.
2. ***Organizing:*** In organizing, managers develop a structure of interrelated tasks and allocate people and resources within this structure.
3. ***Directing:*** Directing encourages member's effort and guides it towards the attainment of organizational goals and objectives.
4. ***Controlling:*** Controlling means evaluating the performance of an organization and its units to see whether the firm is progressing in the desired direction (Wagner III & Hollenbeck, 1995).

Managerial Skills

1. ***Technical skill***: Technical skills involve an understanding of the specific knowledge, procedure, and tools used to make the goods or services produced by the organization or unit.
2. ***Human skill***: Human skill is the ability to work effectively as a group member and to build cooperation among the members of an organization or unit.
3. ***Conceptual skill***: Conceptual skills include the ability to perceive an organization or unit as whole, to understand how its labor is divided into tasks and reintegrated by the pursuit of common goals or objectives.
4. ***Diagnostic skill***: Successful manager also possess diagnostic skills. Diagnostic skills would enable managers to determine what was causing.
5. ***Analytical skill***: In a sense, analytical skills are similar to decision-making skills, and they complement diagnostic skills. Analytical skills enable managers to determine possible strategies and to select the most appropriate for the situation (Griffin, 1984).

Managerial Roles

1. ***Interpersonal role***: In the interpersonal role, managers create and maintain interpersonal relationship to ensure the well-being of their organizations or units.
2. ***Informational role***: Managers have unique access to both internal and external information networks. In informational role, managers receive and transmit the information within these networks.
3. ***Decisional role***: In the decisional role, managers determine the direction to be taken by their organizations or units. Managers must make decisions about improvement in the organizations or units for which they are responsible (Daft, 2000).

Management Style

Management style is a managerial parlance often used to describe the how of management. It is a function of behavior associated with personality (McGuire, 2005). Management style can be understood as a way to manage an organization. Successful and effective managers are able to adapt their styles to fit the requirements of the situation (Huczynski & Buchanan, 1991).

Blake and Mouton's Managerial Grid

The managerial grid, developed by Robert R. Blake and Jane S. Mouton (1964, cited in Hersey & Blandchard, 1993)contains five different styles as follows;

Country-club management (1, 9): This management has high concern for people and low concern for task accomplishment. The manager focuses on being agreeable and keeping human relations smooth.

Team or democratic management (9, 9): This management has high concern for both production and people. The manager emphasizes intently about task accomplishment and cares deeply moderate consideration for the needs of people.

Middle-of-the-road-management (5, 5): This management has medium concern for both production and people. The manager emphasizes work requirement to a moderate degree and shows moderate consideration for the needs of people.

Impoverished management (1, 1): This management has low concern for people and low concern for production. The manager is uninvolved in the work and withdraws from people.

Authoritarian management (9, 1): This management has high concern for production and low concern for people. The manager is result driven, and people are regarded as tools to that end.

Job Satisfaction

Klassen (2010) defined job satisfaction as "perceptions of fulfillment derived from day-to-day work activities" (cited in Allen, 2014).

According to Sageer, Rafat and Agarwal (2012), variables that determine employee satisfaction can be categorized into two. They are personal and organizational variables. Personal variables include personality, expectation, age, education and gender differences.

Organizational variables include policies of compensation and benefits, promotion and career development, job security, working environment and condition, relationship with supervisor, work group and leadership styles.

Spector (1997, cited in Naveed & Rizvi, 2012) describes the potential outcomes of job satisfaction which are divided into two parts; work variable and non-work variables.

The main work variables are job performance, organizational citizenship behaviour (OCB), turnover, absence. The main non-work variables are life satisfaction and physical health.

Theories of Motivation

(1)Maslow's Hierarchy of Needs

Maslow viewed human's motivation as a hierarchy of five needs, ranging from the most basic physiological needs to the highest needs for self-actualization. Maslow's hierarchy of needs is as follows;

- Physiological Needs
- Safety Needs
- Needs of love, affection and belonging
- Needs for Esteem
- Needs for self-actualization

(2) Alderfer's ERG Theory

First, Alderfer broke needs down into three categories; existence needs (Maslow's fundamental needs), relatedness needs (needs for interpersonal relations), growth needs (needs for personal creativity or productive influence). Alderfer stressed that when higher needs are frustrated, lower needs will return, even though they were already satisfied (Griffin, 1984).

(3) Two-factor Theory of Motivation

In the late 1950s, Frederick Herzberg from his research concluded that job satisfaction and dissatisfaction arose from two separate sets of factors. These are motivational and hygiene factors. This theory was termed as the two-factor theory.

Hygiene factors are job factors that create dissatisfaction and emanate from extrinsic job contexts. "Hygiene" factors include salary, work conditions and company policies and administration, interpersonal relationship.

Motivators are the intrinsic contents of a job that satisfy higher order needs. The motivational factors are also jobs factors that increase motivation whose absence does not necessarily result into dissatisfaction (Griffin, 1984).

Methodology

Quantitative Method

Sample

The population was (387) teachers. (76) senior teachers, (110) junior teachers were randomly selected as participants. The total number of (186) teachers in Insein Township participated in this study.

Instrumentation

In order to measure headmistresses' management styles and job satisfaction of teachers, the questionnaire for teachers was used. The first one was to collect the personal information concerning gender, qualification, years of teaching service, position and serving year in the current school. The second was questionnaire for teachers' job satisfaction. The third one was teacher's perception on their headmistress's management styles. The internal consistency (α) of the whole scale of Principal's Management Styles was 0.89. The internal consistency (α) of the whole scale of Teachers' Job Satisfaction Questionnaire was 0.81.

Procedure

For the content validity, the advice and guidance were taken from the eight experienced educators from the Department of Educational Theory. Then, as a pilot study, questionnaires for teachers were distributed to 49 teachers who were not in the study area. After the permission from Township Education Office was taken to do the research in Basic Education High Schools in Insein Township, Yangon Region, questionnaires were distributed to these schools on 16, December, 2016. Distributed questionnaires were collected again by the researcher after one week later. The respondent rate was 100%.

Data Analysis

The collected data of this study were systematically analyzed by using the Statistical Package for the Social Science (SPSS) software version 20. One-way ANOVA, independent samples *t* test and pearson correlation were used.

Qualitative Method

Qualitative research method was used to study headmistresses' management styles and job satisfaction of teachers. Required data was obtained through open-ended questionnaire about headmistresses' management styles (2 items) and job satisfaction of teachers (4 items).

Quantitative Findings

I. Headmistresses' Dominant Management Style Perceived by Teachers in Basic Education High Schools

Table 1: Showing the Final Average Scores on "Concern for People" and "Concern For Task" Dimensions from Each School

School	Concern for people final score	Concern for task final score
A	5.8	6.5
B	5.7	6.1
C	6.1	7.0
D	1.9	3.4
E	5.9	6.5
F	5.8	6.9
Total	**31.2**	**36.4**
Average	**5.2**	**6.1**

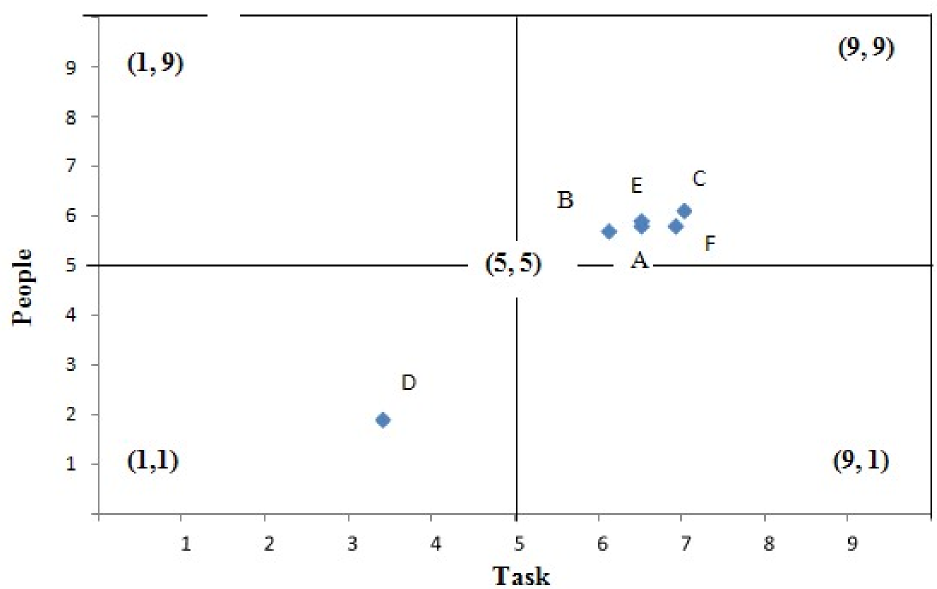

Figure 2: Practicing Management Style

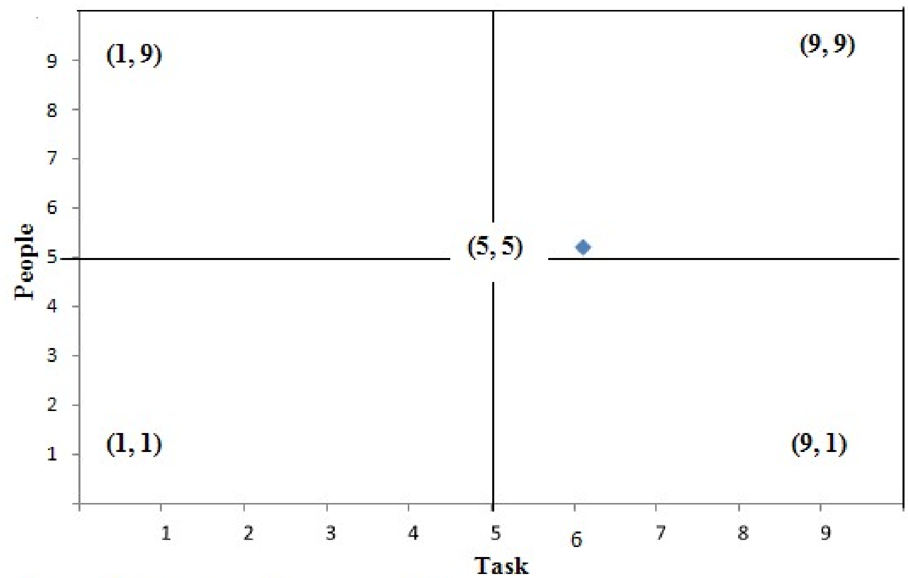

Figure 3: Dominant Management Style

II. The Level of Teachers' Job Satisfaction in Basic Education High Schools

The mean values for the level of teachers' job satisfaction regarding *supervision, colleagues, recognition, security, pay, working condition, advancement, responsibility and work itself* were 3, 3.12, 2.94, 3.08, 2.13, 2.79, 2.88, 2.84, 2.96 respectively. As the overall mean value of job satisfaction was 2.86, the level of teachers' job satisfaction in this study was moderately high. In this study, satisfaction regarding *colleagues* was the highest and satisfaction regarding *pay* was the lowest.

III. The Variations of Teachers' Job Satisfaction Grouped by Position, Years of Teaching Service and Qualification

For the B.E.H.S teachers' job satisfaction level according to position, it was found that the mean value of a group of senior teachers' job satisfaction was higher than the mean value of a group of junior teachers' job satisfaction. Moreover, in the level of satisfaction regarding *recognition* ($p<.05$), there was a significant difference between a group of senior teachers and a group of junior teachers.

For the B.E.H.S teachers' job satisfaction level according to their years of teaching service, it was found that the mean value of a group of teachers whose years of teaching service "1-20" was higher than the mean value of a group of teachers whose years of teaching service "21-40". Moreover, in the level of satisfaction regarding *working condition* ($p<.05$), there was a significant difference between a group of teachers whose years of teaching service "1-20" and a group of teachers whose years of teaching service "21-40".

For the B.E.H.S teachers' job satisfaction level according to qualification, it was found that the mean value of a group of teacher whose qualification "BEd" was the highest. Moreover, it was found that there was no significant different in the perceived level of job satisfaction among the teachers grouped by qualification.

IV. The Relationship between Management Styles of Headmistresses and Job Satisfaction of Teachers

It was found that there were significant and positive relationships among headmistresses' management styles and job satisfaction of teachers. Teachers' job satisfaction was correlated with people-oriented style (r=.461) and with task-oriented style (r=.311). Generally, teachers' job satisfaction moderately correlated with people-oriented and task-oriented management styles of headmistresses.

Qualitative Findings

The open-ended question (1) is ***"How does the principal use to manage the school activities systematically?"***51.08% of teachers (N=95) stated that their principals managed the school calendar systematically to ensure school activities to be completed in time. 38.71% of teachers (N=72) stated that their principals gave them the chance to participate in decision making to implement the school's missions.10.22% of teachers (N=19) stated that their principals did not take into account for every detailed procedures when a variety of the school's activities were to be completed.

The open-ended question (2) is ***"How does the principal treat teachers in school?"***55.91% of teachers (N=104) stated that their principals built on a foundation of trust, treated friendly and warmly to all teachers in the schools. 32.80% of teachers (N=61) stated that their principals treated equally to every teachers without favour. 11.29% of teachers (N=21) reported that their principals, did not tolerate well and did not build collaborative culture.

The open-ended question (3) is ***"State the things that make you most satisfied in your work."***17.20% of teachers (N=32) stated that their colleagues' keeping responsibility, sharing experiences to each other made them satisfied. 30.65% of teachers (N= 57) stated that interesting in teaching profession also made them satisfied. 10.52% of teachers (N=20) stated that having the chance to participate in school's decision making also made them satisfied. 32.80% of teachers (N=61) stated that students' behaviours of paying attention to the lessons in teaching-learning period made them satisfied.2.15% of teachers (N=4) stated that perfect school's physical environment made them satisfied. 6.45% of teachers (N=12) stated that the principal's good supervision, warming and friendly relationship also made them satisfied.

The open-ended question (4) is ***"State the things that make you unsatisfied in your work."*** 30.65% of teachers (N=57) stated that increasing amount of non-teaching workload made them unsatisfied. 37.63% of teachers (N= 70) stated that students' paying no attention to the lessons, disobedience, absence of doing homework and paying no respect to teachers made them unsatisfied. 10.75% of teachers (N= 20) stated that being inequitable in pupil-teacher ratio also made them unsatisfied.6.45% of teachers (N=12) said that irresponsibility of colleagues in performing school related tasks also made them unsatisfied. 8.06% of teachers (N= 15) stated that lack of parental support to encourage students' learning and to perform school activities also made them unsatisfied.4.84% of teachers (N=9) stated that principals' poor supervision skill made them unsatisfied.

The open-ended question (5) is ***"State the recognition for your successful performance."***53.76% of teachers (N=100) stated that they received full recognition for their successful teaching and performance and they was recognized as a respectful teacher by the community. 42.24% of teachers (N= 86) stated that they did not receive any recognition from their principals although they performed successfully in teaching.

The open-ended question (6) is ***"State the chance you get for improving advancement in school (For example, in-service training relating to subject matter, promotion)."*** 65.59% of teachers (N=122) also said that they received an opportunity for promotion and for attending advanced teacher trainings. 34.41% of teachers (N=64) stated that they did not get any promotion although they had many services in teaching profession for long time.

Discussion

According to the findings, the dominant management style that the most headmistresses practice was the team management style. It could be concluded that the headmistresses has a high sensitivity for people in the organization and for the accomplishment of organizational objective. The headmistresses motivate their teachers to achieve their highest goals and achievements. The headmistresses communicate with teachers, share visions, and give them their freedom of actions. According to Patel (2013), this result is supported that women' management style is people-based, role modeling, clear expectations, and rewards, more democratic and participative style.

According to the findings, the level of teachers' job satisfaction in this study was moderately high. In this study, satisfaction regarding *colleagues* was the highest and satisfaction regarding *pay* was the lowest.

Due to the findings, both a group of junior teachers and a group of senior teachers perceived as having moderately high satisfaction level in their job. It could be concluded that a group of senior teachers seem to have more satisfaction in their job than a group of junior teachers.

In this study, a group of teachers whose years of teaching service "1-20" seem to have more satisfaction in their job than a group of teachers whose years of teaching service "21-40". According to Sageer, Rafat and Agarwal (2012), this result is supported that younger employees are more satisfied than older ones as the former has high energy level.

According to the findings, all groups of teacher whose qualification BEd, BA and BSc respectively, perceived as having moderately high satisfaction level in their job. The mean value of a group of teacher whose qualification "BEd" seems to have more satisfaction in their job than other groups of teachers. According to Okkumbe (1982), this result is supported that the level of job satisfaction among graduate teachers increased with their professional grade level (cited in Wangai, 2012).

According to the findings, headmistresses' management style is correlated with teachers' job satisfaction. This study confirmed that people-oriented management style and task-oriented management style are positively correlated with teachers' job satisfaction. According to Vgrovic and Pavlovic (2014), this result is supported that effective people-oriented management style and task-oriented management style lead to teachers' job satisfaction.

Recommendation

Schools should develop more sensitive courses that will assist both boys and girls to develop new orientations about the roles and capabilities of both men and women. A mentoring system should be established within the educational administrative preparatory programmes in order to increase women's confidence and help them to stay focused in management development. The study recommended stopping cultural practices hindering women from progressing in management role, women need to seek mentorship, training and coaching from female leaders.

Women aspiring to be leaders should be prepared for the various challenges that go with management by consciously seeking mentoring and coaching from those who have excellent in management. At individual level, women should learn to challenge the traditional gender roles, which leave most domestic responsibilities in their hands. The government should design management and leadership development programmes for principals through short term trainings, meetings, and workshops so as to enhance their capacity by focusing on acquisition of knowledge and skills. This would lead to increase competency of principals. The government should concentrate on providing better working condition, adequate salaries and resources.

The principals should need to emphasize psychological rewards such as recognition, appreciation, praise and others whenever teachers do good jobs to increase job satisfaction, provide the ways in which teachers can use their talents and creativity to enhance the schools' programmes, provide a safe and pleasant working condition and help teachers develop professionally and also need to act as a role model by being the first to do what need to be done and should also need to motivate teachers and act as coach for the development of future leaders by delegating duties and engaging them in decision making.

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AN ANALYTICAL STUDY OF INSTRUCTIONAL LEADERSHIP ON PROFESSIONAL DEVELOPMENT FOR PROMOTING PRIMARY MATHEMATICS TEACHING

Pyae Phyo Khin[1], Cho Cho Sett[2]

Abstract

The objectives of this research are to investigate the levels of principals' instructional leadership knowledge and to analyze the principals' instructional leadership practices on professional development for promoting primary mathematics teaching, to study the relationship between principals' instructional leadership practices on professional development and teachers' primary mathematics teaching practices, and to identify the excellent predictors of instructional leadership practices on professional development for promoting primary mathematics teaching. Ninety two principals and five hundred teachers were selected in Yangon City Development Area (YCDA) by using the proportional stratified sampling. For quantitative study, questionnaire for principals and questionnaire for teachers were used to collect data. Interview, documentation, and observation checklists were used in qualitative study. Instrument was reviewed by a panel of expert. Descriptive statistics, independent samples *t* test, one-way ANOVA, Item Percent Correct (IPC), Pearson product moment correlation, and multiple regression analysis were employed to analyze the data in quantitative study. Cyclical process was used for qualitative study. The principals' instructional leadership practices on professional development were satisfactory. There were significant differences in principals' instructional leadership practices on professional development grouped by qualification, professional qualification, positions, level of knowledge. There was an association between principals' instructional practices on professional development and teachers' primary mathematics teaching practices. According to the result of multiple regression analysis, providing incentives, organizing learning opportunities, leading learning, and establishing a vision were the excellent predictors for promoting primary mathematics teaching practices. Based on the qualitative data, it appears that principals' instructional leadership practices on professional development had an influence on teachers' primary mathematics teaching practices.

Keywords: Instructional Leadership, Professional Development

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Introduction

Findley and Findley (1992: 102, cited in Chell, 2002) state that "if a school is to be an effective one, it will be because of the instructional leadership of the principal". Moreover, Teacher quality and their effective pedagogy are defined as essential elements that maximize student participation and learning (Colbert et al., 2008; Mills et al., 2009; Dixon & Senior, 2011; cited in Jun*, 2014). This allows principals to rethink how they can better equip teachers with capacity to forester student knowledge acquisition in the classroom (Jun, 2014). Furthermore, mathematics is a core skill for all adult in life and makes an essential contribution to a good rounded education (ACME, 2011a; Vorderman et al., 2011, cited in Joubert, 2013). Mathematics is an excellent vehicle for the development and improvement of a person's intellectual competence in logical reasoning, spatial visualisation, analysis and abstract thought. Students develop numeracy, reasoning, thinking skills, and problem solving skills through the learning and application of mathematics (Singapore Ministry of Education, 2006). Therefore, mathematics teaching is vital role in education. So, it is urgently important to become effective mathematics teaching practices of teachers. The researcher believes that this study will be helpful to the development of a better understanding and appreciation of the importance of the instructional leadership of principals to improve the quality of teacher in primary mathematics teaching of our country

Objectives of the Research

The objectives of this study are as follows:

1. To investigate the levels of principals' instructional leadership knowledge on professional development for promoting primary mathematics teaching
2. To analyze the principals' instructional leadership practices on professional development for promoting primary mathematics teaching
3. To study the differences in principals' instructional leadership practices on professional development for promoting primary mathematics teaching in terms of personal factors and their knowledge level

4. To investigate the levels of teachers' knowledge on primary mathematics teaching
5. To study the relationship between principals' instructional leadership practices on professional development and teachers' primary mathematics teaching practices perceived by teachers
6. To identify the excellent predictors of instructional leadership practices on professional development for promoting the primary mathematics teaching

Research Questions

1 What are the levels of principals' instructional leadership knowledge on professional development for promoting primary mathematics teaching?

2 To what extent do teachers perceive the principals' instructional leadership practices on professional development for promoting primary mathematics teaching?

3 Are there any significant differences in principals' instructional leadership practices on professional development for promoting primary mathematics teaching in terms of personal factors and their knowledge level?

4 What are the levels of teachers' knowledge on primary mathematics teaching?

5 Is there any relationship between principals' instructional leadership practices on professional development for promoting primary mathematics teaching and teachers' mathematics teaching practices perceived by teachers?

6 What are the excellent predictors of instructional leadership practices on professional development for promoting the primary mathematics teaching?

Theoretical Framework

The following five dimensions of instructional leadership will be used in this research.

- Establishing a vision
- Organizing learning opportunities
- Leading learning
- Developing leadership
- Providing incentives

Establishing a Vision

The principal must be involved in the developing of a realistic vision_ based on alternative possibilities_ of better student outcomes, more meaningful curriculum content, or different pedagogical approaches to promote problem solving skill, reasoning skill, connection skill, communication skill, and representation skill. Therefore, there are four goals for professional development: goals for student learning, goals for teacher learning, goals for teaching practices and goals for the organization. In establishing a vision, the best professional development experience for mathematics teachers are needed to be considered. They include the followings:

- They are driven by a clear, well defined image of effective teaching and learning.
- They provide teachers with opportunities to develop knowledge and skills, and broaden their teaching approaches for strengthening the learning opportunities of mathematics teaching in promoting student outcomes.
- They use instructional methods to promote adult learning.
- They build or strengthen the learning community of mathematics teachers.
- They prepare and support teachers to serve in leadership roles.
- They provide links to other schools.
- They include continuous assessment.

This vision is a powerful catalyst for teachers to engage in professional development and the basic of teachers' goals for student outcomes. Teachers' ideas are solicited to establish this vision. And then, the principal finds ways to make teachers' diverse practices and voices to be valuable to the vision and mission.

Organizing Learning Opportunities

A principal should be ready to plan for, understand and support ongoing needs as the learning community grapples with new learning and change, and that careful planning and sustainability are two features of effective professional learning activities, features which permit teachers to obtain follow-up and support. To be effective in mathematics professional development, teachers need to ample time for in-depth investigation, reflection, continuous learning, professional materials, teaching materials, computers and advanced technology for themselves and their students. The best professional development experiences for mathematics teachers provide them with opportunities to develop knowledge and skills and broaden their teaching approaches to create better learning opportunities for students. Moreover, principals allow teachers to construct their own knowledge through immersion in the mathematical processes. Effective principals reorganize collaborative networks among educators were essential for successful teaching and learning.

Leading Learning

Leading learning is that instructional leaders become to involve in the learning itself and promote learning cultures within their schools. Firstly, the principal leads the structures and conditions within the learning community and provides the support through continuing the dialogue, being involved in the process, coaching and problem solving within the environment of collegiality. The second is about knowing what content and learning activities are likely to be of benefit. The third challenge is for leaders to understand what is required if improvements in student outcomes are to be sustained once major external support is withdrawn and the drive and initiative must come from the teachers themselves (Timperley *et al*., 2007).

Developing Leadership

Teachers are leaders lead within and beyond the classroom, identify with and contribute to a community of teacher learners and leaders, and influence others towards improved educational practice'. Teacher leadership has three main facets:

- Leadership of students or other teachers
- Leadership of operational tasks
- Leadership through decision making or partnership

To become teachers master the skills of their profession, they need to be encouraged to step beyond their classrooms and play roles in the development of the whole school and beyond. Instructional leaders support the followings:

- Planning and implementing professional development opportunities for themselves and others,
- Acting as agents of change,
- Promoting a shared vision of mathematics education, and
- Supporting other teachers.

Providing Incentives

To become instructionally effective schools, principals develop incentives for learning that are school-wide in orientation. Principals have an important role in encouraging teachers to be involved in professional learning programs. Besides, principals recognize and celebrate people success and achievements, and their contributions to the professional/ learning community. Effective principals invite teachers to be part of the change process and encourage them to participate in different professional learning programs such as workshop, seminars, conferences and team learning. And then, they find ways to reward or recognize teachers for their efforts. Some of these are informal such as private words of praise; others are more formal such as recognition before peers, nomination for rewards or letters to the personnel files of teachers. Moreover, successful leaders have high expectations for themselves and their teachers.

According to Loucks-Horsely et al. (2010), instructional leadership knowledge are nature of mathematics, learners and learning, teachers and teaching, adult learning and professional development, and change process.

As an instructional leader, school principals are also responsible to improve mathematical process skills on the followings.

Problem Solving: Problem solving is the process of applying previous acquired knowledge in new and unfamiliar situations (Scusa, 2008).

Reasoning: Mathematical reasoning refers to the ability to analyse mathematical situations and construct logical arguments (Singapore Ministry of Education, 2006).

Communication: Communication is the process of expressing mathematical ideas and understanding orally, visually, and in writing, using numbers, symbols, pictures, graphs, diagrams, and words (Wichelt, 2009).

Connection: Connection refers to the ability to see and make linkages among mathematical ideas, between mathematics and other subjects, and between mathematics and everyday life (Singapore Ministry of Education, 2006).

Representation: Representation refers both to process and to product _ in other words, to the act of capturing a mathematical concept or relationship in some form and to the form itself (NCTM, 2000).

Definitions of Key Terms

Instructional Leadership

Instructional leadership refers to actions undertaken to develop a productive and satisfying work environment for teachers and desirable learning conditions and outcomes for children (Greenfield, 1987).

Professional Development

Professional development is defined as process and activities designed to enhance the professional knowledge, skills, and attitudes of educators so that they might, in turn, improve the learning of students (Guskey, 2000, cited in Steiner, 2004).

Operational Definition

Instructional leadership refers to actions undertaken to promote teachers' professional development for improving students learning outcomes. These actions include establishing a vision, providing learning opportunities, leading learning, developing leadership, and providing incentives.

Research Method

Both quantitative and qualitative methodologies were used in this study.

(i) Sample

The sample was consisted of 92 schools from YCDA. In addition, 92 principals and 500 teachers from selected schools in YCDA were chosen by using proportional stratified sampling method. So, teacher sample included 82 (16.3%) teachers from high school level, 100 (20%) teachers from middle school level, and 318 (63.7%) teachers from primary school level. Purposive sampling method is used in qualitative study. Among selected schools, 4 schools were purposefully chosen from the primary schools, and each 2 schools was chosen from middle schools and high schools group based on the highest and the lowest mean scores in each level.

(ii) Instruments

In the principals' instructional leadership knowledge questionnaire, demographic data, items for nature of mathematics, learners and learning, teachers and teaching, change process, and adult learning and professional development were included. There are 30 true/false items, and 10 multiple choice items in this questionnaire. There were 41 items in instructional leadership practices questionnaire and each item was rated on a five-point Likert scale ranging from 1 to 5 (1=never, 2=seldom, 3=sometimes, 4=often and 5=always). Among them, 8 items were related to the area of "Establishing a Vision", 10 items were related to "Providing Learning Opportunities", 9 items were related to "Leading Learning", 8 items were also related to "Developing Leadership" and 6 items were related to "Providing Incentives". Moreover, the set of questionnaire for teachers was developed by dividing two portions. One portion was to examine the knowledge of teachers based on how children learn and mathematical process skills. This knowledge questionnaire included 10 true / false items relating to knowledge on how children learn, 15 multiple choice items, and 9 matching items related to mathematical process skills. The other is mathematics teaching practices of teachers. There are 20 items (five point Likert-type) relating to teaching practices on mathematical process skills: 1=never, 2=seldom, 3=sometimes, 4=often and 5=always. The internal consistency (Cronbach's alpha) were 0.87 for the questionnaire to investigate principals' instructional leadership practices, 0.69 for principals' instructional leadership knowledge questionnaire, 0.85 for the questionnaire to explore teachers' knowledge on primary mathematics teaching and 0.72 for the questionnaire of teachers' teaching practices. In qualitative study, interview, documentations, and observation checklist were used.

(iii) Procedures

In order to construct appropriate questionnaires concerning this study, the related literature was reviewed and analyzed. In addition, the researcher got some advice and guidance from 17 expert teachers who were experienced and well versed in this field. And then, the wording and content of items were modified to clarify for participants in according with the advice of experts. After receiving permission from the Director General of Education in Yangon Region, pilot study was conducted on 12th July 2016 in 11 Basic Education Schools. After reviewing and modifying the items of questionnaires based on the responses of pilot test, questionnaires were distributed to the selected Basic Education Schools on 1st September, 2016. All questionnaires were collected after two weeks. Interviews were conducted with selected principals and teachers to obtain more information about instructional leadership practices from December, 2016 to February, 2017.

(iv) Data Analysis

Descriptive, Item Percent Correct (IPC), Pearson correlation, Independent sample *t* test, One way ANOVA followed by Tuskey post hoc analyses, and Multiple Regression were used for quantitative data analysis. To analyze the qualitative data, the cyclical process was used.

Findings

Table 1: Knowledge Level of Principals about Nature of Mathematics (N=92)

Scoring Range	No. of Principals	Percentage (%)	Remark
<50%	2	2.2	Below satisfactory level
50%-74%	15	16.3	Satisfactory level
≥75%	75	81.5	Above satisfactory level

Scoring range: <50%= below satisfactory 50%-74%= satisfactory ≥75%=above satisfactory

Table 2: Knowledge Level of Principals about Learners and Learning (N=92)

Scoring Range	No. of Principals	Percentage (%)	Remark
<50%	8	8.7	Below satisfactory level
50%-74%	46	50	Satisfactory level
≥75%	38	41.3	Above satisfactory level

Scoring range: <50%= below satisfactory 50%-74%= satisfactory ≥75%=above satisfactory

Table 3: Knowledge Level of Principals about Teachers and Teaching (N=92)

Scoring Range	No. of Principals	Percentage (%)	Remark
<50%	2	2.2	Below satisfactory level
50%-74%	28	30.4	Satisfactory level
≥75%	62	67.4	Above satisfactory level

Scoring range: <50%=below satisfactory 50%-74%= satisfactory ≥75%=above satisfactory

Table 4: Knowledge Level of Principals about Change Process (N=92)

Scoring Range	No. of Principals	Percentage (%)	Remark
<50%	3	3.3	Below satisfactory level
50%-74%	22	23.9	Satisfactory level
≥75%	67	72.8	Above satisfactory level

Scoring range: <50%= below satisfactory50%-74%=satisfactory≥75%=above satisfactory

Table 5: Knowledge Level of Principals about Adult Learning and Professional Development (N=92)

Scoring Range	No. of Principals	Percentage (%)	Remark
<50%	7	7.6	Below satisfactory level
50%-74%	51	55.4	Satisfactory level
≥75%	34	37.0	Above satisfactory level

Scoring range: <50%= below satisfactory 50%-74%= satisfactory≥75%= above satisfactory

Table 6: Mean Values and Standard Deviations for Principals' Instructional Leadership Practices on Professional Development for Promoting Primary Mathematics Teaching Perceived by Teachers (N=500)

No	Variables	Mean	SD	Remark
1.	Establishing a Vision	3.52	.81	Moderately high
2.	Organizing Learning Opportunities	3.23	.78	Satisfactory
3.	Leading Learning	3.42	.83	Satisfactory
4.	Developing Leadership	3.56	.86	Moderately high
5.	Providing Incentives	3.37	.98	Satisfactory
	Overall Instructional Leadership Practices	**3.41**	**.74**	**Satisfactory**

1.00-1.49=very low 1.50-2.49=moderately low 2.50-3.49=satisfactory .50-4.49= moderately high 4.50-5.00=very high

Table 7: Results of Independent Samples *t* Test for Instructional Leadership Practices of Principals Perceived by Teachers on Professional Development for Promoting Primary Mathematics Teaching

Dependent Variable-*Overall instructional leadership practices*

Independent Variables	Group	Mean	SD	*t*	*df*	*P*
Gender	Male	3.44	.88	.306	115.510	ns
	Female	3.41	.71			
Qualification	BEd; Mphil; MEd	3.52	.71	3.273	498	.001***
	BA; BSc	3.30	.76			
Administrative Service	≤10years	3.46	.73	1.49	498	ns
	>10years	3.37	.75			

*p<.05, **p<.01, ***p<.001, ns= no significance

According to Table 7, it was found that there was significant difference in overall instructional leadership practices depending to their qualification (t (498) = 3.273, p<.001). There were no significant differences in overall instructional leadership practices on professional development according to gender, and administrative service.

Table 8: ANOVA Results of Principals' Instructional Leadership Practices Perceived by Teachers on Professional Development for Promoting Primary Mathematics Teaching

Dependent Variable-*Overall instructional leadership practices*

Independent Variables	**Group**	**Mean**	**SD**	***F***	***P***
Professional Qualification	JTTC	3.30	.71	5.520	.004***
	DTEC	3.43	.57		
	BEd;MPhil;M.Ed	3.52	.76		
Service	≤20	3.31	.71	.534	ns
	20-30	3.42	.67		
	>30	3.43	.80		
Position	Group 1	3.35	.80	3.257	.039*
	Group 2	3.48	.61		
	Group 3	3.56	.86		
Knowledge level of nature of mathematics	Group A	2.63	.21	2.237	ns
	Group B	3.41	.80		
	Group C	3.42	.73		
Knowledge level of learners and learning	Group A	3.38	.90	.089	ns
	Group B	3.41	.72		
	Group C	3.43	.73		
Knowledge level of teachers and teaching	Group A	3.09	.81	1.358	ns
	Group B	3.34	.78		
	Group C	3.44	.73		
Knowledge level of change process	Group A	2.41	.49	17.093	.000***
	Group B	3.36	.75		
	Group C	3.47	.72		

Independent Variables	Group	Mean	SD	*F*	*P*
Knowledge level of adult learning and professional development	Group A	3.15	.76	4.668	.010***
	Group B	3.42	.78		
	Group C	3.49	.67		

Group 1= primary school principals, Group 2 = middle school principals, Group 3 = high school principals Group A=below satisfactory level, Group B=satisfactory level, Group C= above satisfactory level *p<.05, **p<.01, ***p<.001, ns= no significance

According to Table 8, there were significance differences in overall instructional leadership practices on professional development among three groups of teachers organized by their professional qualification, position, their level of knowledge about change process, and adult learning and professional development. There were no significant differences in overall instructional leadership practices on professional development with respect to their service, and their levels of knowledge about nature of mathematics, learners and learning, and teachers and teaching.

Table 9: Knowledge Level of Teachers about How Children Learn (N=500)

Scoring Range	Frequency	Percentage	Remark
<50%	4	.8	Below Satisfactory Level
50%-74%	237	47.4	Satisfactory Level
≥75%	259	51.8	Above Satisfactory Level

Scoring range: <50%= below satisfactory 50%-74%=satisfactory ≥75%= above satisfactory

Table 10: Knowledge Level of Teachers about Mathematical Process Skills (N=500)

Scoring Range	Frequency	Percent	Remark
<50%	184	36.8	Below Satisfactory Level
50%-74%	285	57.0	Satisfactory Level
≥75%	31	6.2	Above Satisfactory Level

Scoring range: <50%= below satisfactory 50%-74%=satisfactory ≥75%= above satisfactory

Table 11: Mean Values and Standard Deviations of Primary Mathematics Teaching Practices of Teachers (N=500)

Variable	Mean	SD	Remark
Primary Mathematics Teaching Practices	3.72	0.61	often

1.00-1.49=never 1.50-2.49= seldom 2.50-3.49=sometime 3.50-4.49= often 4.50-5.00=always

Table 12: Correlation between Principals' Instructional Leadership Practices on Professional Development and Teachers' Primary Mathematics Teaching Practices

	ILP	MTP
Instructional Leadership Practices	1	.523**
Teaching Practices	.523**	1

**. Correlation is significant at the 0.01 level (2-tailed).

ILP= Principals' Instructional Leadership Practices on Professional Development

MTP=Teachers' Primary Mathematics Teaching Practices

According Table 12, there is an association between principals' instructional leadership practices on professional development and primary teachers' mathematics teaching practices ($r=.523$, $p<0.01$).

The Potential Factors Affecting Primary Mathematics Teaching Practices

To investigate the excellent predictors of instructional leadership practices on professional development for promoting mathematics teaching practices, simultaneous multiple regressions was conducted by identifying predictors such as establishing a vision (EV), organizing learning opportunities (OLO), leading learning (LL), developing leadership (DL), and providing incentives (PI). The means, standard deviations, and inter correlations were shown in Table 5.

Table 13: Means, Standard Deviations, and Inter-correlations for Teaching Practices and Predictors Variables

Variables	Mean	SD	EV	OLO	LL	DL	PI
Mathematics Teaching Practices	3.72	.61	.450***	.475***	.475***	.438***	.458***
Predictors Variables							
Establishing a Vision	3.52	.81		.737***	.721***	.631***	.618***
Organizing Learning Opportunities	3.23	.78			.791***	.728***	.683***
Leading Learning	3.41	.83				.752***	.695***
Developing Leadership	3.56	.86					.785***
Providing Incentives	3.37	.98					-----

When the combination of variables to predict primary mathematics teaching included establishing a vision (EV), organizing learning opportunities (OLO), leading learning (LL), developing leadership (DL), providing incentives (PI), F (5,494) =37.88, p<.001.

The beta coefficients were presented in Table 13. Providing incentives (PI), organizing learning opportunities (OLO), leading learning (LL), and establishing a vision (EV) significantly predict primary mathematics teaching practices when all five variables are included. The adjusted R squared value was .27. This indicates that 27% of the variance in mathematics teaching practices was explained.

Table 14: Simultaneous Multiple Regression Analysis for Factors Predicting Primary Mathematics Teaching Practices

Variables	B	Std. Error	Beta
Establishing a Vision	.097	.046	.129*
Organizing Learning Opportunities	.110	.055	.142*
Leading Learning	.102	.053	.140*
Developing Leadership	.006	.050	.009
Providing Incentives	.109	.040	.177**
Constant	2.279	.113	
R^2=.27; F(5,494)=37.88, *p< .05, **p<.01, ***p<.001			

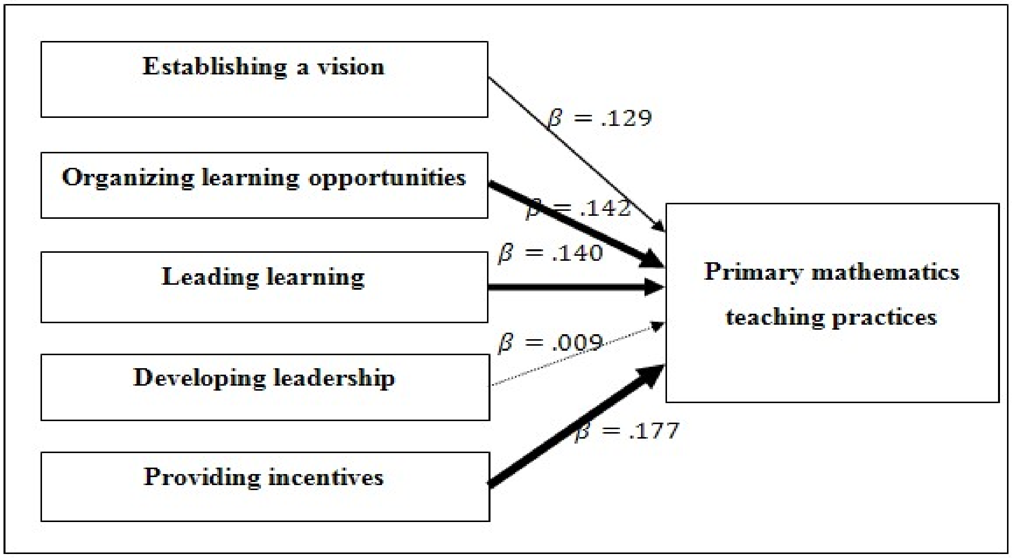

Figure 1: Potential Factors Affecting Primary Mathematics Teaching Practices

Predicting on Primary Mathematics Teaching Practices (Statistically significant)

Predicting on Primary Mathematics Teaching Practices (Not significant)

With regard to the difficulties in implementing the teachers' professional development activities in their schools, principals gave the following some responses.

1. Teachers have many responsibilities for all subjects. (N=5, 62.5%)
2. Principals are busy with clerical work. (N=1, 12.5%)
3. Teachers have too much workload of teachers (marking, remedial teaching, full time of teaching). (N=8, 100%)
4. Their schools are double shift schools. (N=2, 25%)
5. Their schools are necessary to be provided financial support for professional development. (N=3, 37.5%)
6. They can not sufficiently support mathematical books. (N=5, 62.5%)
7. Teachers have little time to read and study books at the school. (N=8, 100%)
8. Their schools do not have enough teachers. (N=2, 25%)

9. It is necessary to supply of more teachers in order to focus on professional development. (N=6, 75%)
10. Principal is more emphasis on taking the responsibilities for keeping problem children in the school. (N=1, 12.5%)

Moreover, some suggestions for promoting mathematics teaching recommended by the teachers were as follows:

The principal should

1. Provide teachers with necessary mathematical reference books. (N=10, 62.5%)
2. Provide teaching aids necessary for teaching. (N= 12, 75%)
3. Make Pre-planning and discussing the lessons with teachers before teaching. (N=2, 12.5%)
4. Motivate teachers to carry out their professional development. (N=2, 12.5%)
5. Make careful classroom observations to improve teachers' teaching practices. (N=2, 12.5%)
6. Help teachers gain satisfaction from their teaching. (N=2, 12.5%)
7. Award outstanding teachers "the best teaching prize" for the whole academic year based on their teaching performance. (N=4, 25%)
8. Arrange a separate room and setting time for teachers' professional development. (N=12, 75%)
9. Create and plan opportunities for teachers to attend workshop, refresher courses, and educational talks. (N=4, 25%)
10. Keep and recruit the outstanding mathematics teachers as much as possible (N=1, 6.25%)

According to the qualitative findings, Group A principals observed and gave feedback about their teaching and established goals concerning mathematics teaching. Group B principals had no special vision or goal about mathematics teaching. Group A principals supported mathematical books and teaching aids and arrange time and place to discuss the mathematics teaching and learning while Group B principals supported only Pyinnya Tazaung and teaching aids provided by Ministry of Education and have no definite time and place to discuss mathematics teaching and learning. Group A principals often involved in leading learning although Group B principals sometimes involved in leading learning. Almost all principals gave teachers opportunities concerning developing leadership. Group A principals recognized formally and informally for teachers' good teaching practices.

According to qualitative findings, teachers from Group A principals' schools gave opportunities to students to think the ways to solve the problems and to discuss in group, used teaching aids for improving representation, explained the problem by connecting everyday life, and sometimes asked questions such why and how. Teachers from Group B principals' schools normally led to solve the problems, were weak in using teaching aids, were less emphasis on connecting everyday life, did not asked questions such as how and why.

Conclusion

Conclusion and Discussion

It can be concluded that most of the principals in this study had above satisfactory level of knowledge about nature of mathematics, learners and learning, teachers and teaching, and change process. Most of the principals are satisfactory level about adult learning and professional development.

The quantitative findings of this study revealed that the practices on establishing a vision were moderately high and it appears to be the fourth excellent predictor of teachers' primary mathematics teaching practices. According to the result of interview indicated that most of the principals from Group A had goals regarding student learning, methods of teaching and collaborative learning. Group A principals also facilitate to establish the goals for mathematics teaching and learning process together with their teachers. Therefore, as a principal should establish a vision or goals of teacher professional development on student learning.

According to quantitative findings, organizing learning opportunities was the best second predictors for teachers' primary mathematics teaching practices. Moreover, principals seldom practice in allocating appropriate funds for professional development. In qualitative findings, it was weak in supporting appropriate funds for professional development. Group A principals supported needed materials for creating teaching aids and some mathematical books. It can be said that the more principals support funds, time, and mathematical books, the more teachers' profession improve.

According to the questionnaire survey, the practice of principals on leading learning was moderately high and it was the third excellent predictor for teachers' primary mathematics teaching practices. Based on the interview results, it is assumed that only two principals were keen to support teachers as facilitators for their professional development. Documentation highlighted that middle school level and high school level principals always involved in board of study meeting. Interview indicated that they sometimes involved in board of study meeting if they had time. Group B principals were weak in leading board of study meetings because they put an emphasis on administrative tasks. Thus, the findings highlighted that leading learning is also important for promoting teacher professional development.

The principals' instructional leadership practices on developing leadership were moderately high. Interview indicated that their teachers were allowed by principals to participate in school decision making process, shared ideas with colleagues, work with parents in order to promote their children's mathematics learning and lead mathematics teaching in some ways. Thus, it is necessary to delegate authority about instructional resources and activities to improve their teaching and professional development. So, principals are highly suggested to focus more on this area of developing leadership as much as possible.

Principals moderately practised providing incentives and it appeared to be the first excellent predictor of teachers' primary mathematics teaching practices. Interview pointed out that Group A principals publicly recognized teachers individually or in group for their good teaching practices and trying to sit for the selecting examination of outstanding teacher especially at meetings and annual prize giving ceremony held by parent teacher association. Moreover they gave rewards to the teachers who can create good teaching aids. Therefore, it has been recognized as a vital part of enhancing teacher professional development to promote primary mathematics teachings. It is clear that principals need to be trained to know the importance of providing incentives and the ways concerning providing incentives.

It was found that the practices of principals who had BEd degree were more than those of principals who had BA or BSc degree. There were significant differences in instructional leadership practices on professional development in accordance with their professional qualification. It appeared that the practices principals who attended BEd were more than those of principals who attended DTEC or JTTC. Moreover, a similar result was found in qualitative study according to these demographic characteristics. These differences apparently influence on instructional leadership practices on professional development and it is necessary to encourage primary level school principals to attend BEd degree courses.

There were significant differences in the instructional leadership practices on professional development according to their administrative service. It was concluded that the principals who had 10 years and less than 10 years of administrative service performed all areas of instructional leadership practices more than the principals who had more than 10 years of administrative service did. Based on the qualitative findings, it was found that the principals who had less administrative service possessed much professional qualification. Therefore, it would be suggested that the principals should have opportunities to attend professional training.

According to position, it was found that the practice of Group A (Primary level school principals) was significantly different from that of Group B (Middle level school principals) and Group C (High school level school principals) in the area of establishing a vision. Group C practised instructional leadership on professional development more than Group B and Group A.

There were significant differences in instructional leadership practices on professional development among principals relating to their knowledge level of change process, and adult learning and professional development. It is likely concluded that among the three groups, high satisfactory level group (Group C) mostly practised the instructional leadership on professional development. The instructional leadership practices of principals who had above satisfactory level for promoting professional development were more than other groups. It is also urgently needed to update principals’ knowledge of professional development and instructional leadership.

According to the investigation into the knowledge of teachers on how children learn, most of the teachers were above satisfactory level. It can be concluded that they have sufficient knowledge about how children learn. Moreover, this study also investigated knowledge level of teachers on mathematical process skills. Only 31 teachers had above satisfactory level and 184 out of 500 teachers had below satisfactory level. Interview and documentation revealed that board of study meeting was found of discussing exam result of students and official instructions by Township Education Office, and putting less emphasis on professional development activities. Therefore, creating opportunities for participating in workshops, seminars, lesson study, mentoring and coaching programs, and providing the requirements such as financial support and books and teaching learning materials concerning mathematics should be implemented so that teachers can improve pedagogical content knowledge for mathematical process skills. It would be better when these opportunities are arranged in school setting in order that teachers can grasp these chances without giving much time. Findings from the questionnaire survey indicated that they often provided learning opportunities to promote mathematical process skills.

There is a relationship between instructional leadership practices of principals on professional development and primary mathematics teaching practices of teachers ($r=.523,\ p<.0.01$). These results are similar to those of Mwangi (2009) who attributed principals' leadership and engagement strongly impacts mathematics teaching performance.

Suggestions

- Since the principals' instructional leadership practice on professional development is crucial for promoting primary mathematics teaching, it is necessarily important to promote the role of principals concerning instructional leadership on professional development.
- Principals should encourage teachers to engage in the professional development activities for promoting primary mathematics teaching by establishing goals and directions based on students learning and their teaching practices.

- Principals should enhance teachers' engagement in professional development for promoting primary mathematics teaching by organizing learning opportunities such as time, place, books, and human resources.
- Principals should actively lead teachers' professional development by creating collaborative learning culture.
- Principals should create opportunities for teachers to participate in implementing professional development activities such as planning for themselves and others.
- Principals should recognize and praise teachers to their eagerness of participating in the professional development activities.
- Principals should be encouraged to draw individual development plan for teachers.
- Extra work loads which can be waste of energy and time for principals and teachers should be reduced.
- It is necessarily important to organize professional development activities such as lesson study, workshops, seminars, institutes, demonstration lesson, action research, coaching, mentoring, online professional development, and professional network that are supportive to improve primary mathematics teaching.
- It is certainly needed to support and give opportunities to principals for promoting their instructional leadership practices concerning professional development.
- It is highly required to appoint the sufficient number of well trained teachers to be able to implement professional development activities in the school setting.
- It is greatly necessary that school funds should be allocated and well spent on professional development activities.
- It is truly needed professional development programs for principals as instructional leaders in mathematics.

- School inspectors should emphasize not only teaching learning activities but also teachers' professional development activities when they visited the schools.

Need for Further Research

Further research could also find out the factors affecting principals' instructional leadership on professional development. It is necessarily demanded to reveal the barriers in instructional leadership practices on professional development for promoting primary mathematics teaching. Further study could compare the instructional leadership practices on professional development for promoting primary mathematics teaching between principals and subject deans. Moreover, it is necessary to investigate principals' instructional leadership practices on professional development for promoting primary mathematics teaching in other townships, states and divisions to represent the whole country. Furthermore, the similar study like "An analytical study of instructional leadership on professional development for promoting primary mathematics teaching" should be conducted for other subjects in order to promote teaching learning process of the respective subjects.

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A STUDY OF INSTRUCTIONAL LEADERSHIP PRACTICES OF BASIC EDUCATION HIGH SCHOOL PRINCIPALS

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Abstract

The main aim of this study is to study instructional leadership practices of the Basic Education High School Principals in Myawaddy Township, Kayin State. The specific aims of this study are (1) to study the instructional leadership practices of the principals in creating an effective learning environment, (2) to investigate the instructional leadership practices of the principals in improving classroom instruction, (3) to examine the instructional leadership practices of the principals for the professional development of the teachers, (4) to study the variations of principals' instructional leadership practices related to their personal factors, and (5) to find out the variations of principals' instructional leadership practices among selected schools.

Quantitative and Qualitative methods were used. Two sets of questionnaire were used to collect the required data, one for the teachers and one for the principals. The questionnaires were developed by the researcher based on the literature review. The reliability coefficient (Cronbach's alpha) was 0.95 for the questionnaire to explore the level of performance of instructional leadership practices of Basic Education High School Principals rated by teachers. Five principals and two hundred and nine teachers in Myawaddy Township, Kayin State were selected as the participants for this study.

Instructional leadership practices of Basic Education High School Principals in this study were divided into three main areas (1) creating an effective learning environment, (2) improving classroom instruction and (3) teachers' professional development. Principals' performances were rated at moderately high level in all areas of instructional leadership practices. From the open-ended questions answered by the principals themselves, it was found that their practices were weak in the areas of improving classroom instruction and teachers' professional development. Statistically significant differences were found between the principals according to the subjects they can teach well. There were also significant differences of the principals' performance among the schools.

Keyword: Instructional Leadership

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Introduction

The technical core of the schools is the teaching and learning process that all other activities are secondary to this basic goal. Teaching and learning activities are complex processes that need careful attention and study.

The success or failure of the school's instructional program depends largely on how the principal conducts school activities for improvement of teaching and learning situations. As a result, leading instructional efforts in schools has evolved into a primary role for school principals. Therefore, this study investigated the instructional leadership practices of the Basic Education High School Principals.

Aims of the Study

The main aim of this study is

- To study the instructional leadership practices of Basic Education High School Principals in Myawady Township, Kayin State.

The specific aims are:

- To study the instructional leadership practices of the principals in creating an effective learning environment;
- To investigate the instructional leadership practices of the principals in improving classroom instruction;
- To examine the instructional leadership practices of the principals for the professional development of the teachers;
- To study the variations of principals' instructional leadership practices related to principal's personal factors and
- To find out the variations of principals' instructional leadership practices among selected schools.

Research Questions

The research questions are as follows.

- To what extent do the principals perform the instructional leadership practices in creating an effective learning environment?

- To what extent do the principals perform the instructional leadership practices in improving classroom instruction?
- To what extent do the principals perform the instructional leadership practices for the professional development of the teachers?
- Are there any significant differences in principals' instructional leadership practices related to principal's personal factors?
- Are there any significant differences in principals' instructional leadership practices among selected schools?

Theoretical Framework

A school principal promotes the success of all students by advocating, nurturing, and sustaining a school culture and instructional program conducive to student learning and staff professional growth (Hoy & Hoy, 2006). There are three areas of instructional leadership practices which are critical for the principals to perform.

Creating an Effective Learning Environment

For improving the instructional program for achieving high academic standards among teachers and students, the school principal is responsible for creating an effective and efficient learning environment.

Managing people and resources

One of the school principal's responsibilities is to enhance the effectiveness of the learning environment in the school by managing the resources (people, time, and finance, materials) strategically. Some of the important tasks for managing the faculty members and school resources strategically are noted as follows.

Tasks to be implemented before the opening of the school are to inspect, renovate and maintain school plants and facilities, to make a plan for providing necessary instructional resources, to manage student registration, to organize subject-wise committees and education committee, to allocate teaching subjects to the teachers according to their specialized subjects, to construct the academic timetable so that the teacher can start teaching at the first opening day of the school, to develop the policies and perform the activities for the students to learn in a peaceful, safe and secure environment, to arrange and provide resources for the effective use of multimedia classroom and school library, to provide necessary equipment and facilities for the science laboratory, to make a plan for the achievement of annual learning goals, school improvement goals and other targets.

Tasks to be implemented during the school week are to hold the regular assembly for informing the teachers and students of their routine duties and activities, to organize the activities of all-round development of the students, to supervise and record the activities of school council in keeping the well-being of school environment, to check the accomplishment of the activities to be performed during the school week regularly, to organize the activities for the special programs in school calendar.

Creating a positive school climate

A sustainable, positive school climate includes norms, values, and expectations that support people feeling socially, emotionally, and physically safe. In order to fulfill this need, the school principal must nurture positive adult-adult relationships, positive adult-student and student-student relationships, shared decision-making, the value of diversity, cooperative learning, conflict-prevention, mutual support and ongoing communication, school-community involvement, staff morale and connectedness (Cohen, Mccabe, Michelli & Pickeral, 2009).

Improving Classroom Instruction

The school principal can improve classroom instruction by observing classrooms, using achievement data, and considering samples of student work and the human relation approaches to use to increase reflection, problem solving and improved practice on the part of teachers and the structures and formats of various ways to work individually or in groups with teachers (Glickman, 2002).

Observing Classroom Instruction

The principal should examine the various teaching styles, particular learning goals, and the context of a particular teacher with his or her class of students in a specific subject or field of learning such as planning and preparation of the lesson, the classroom environment and the instruction.

In planning and preparation of the lessons of the teachers, the instructional leader should observe demonstration of knowledge of content and pedagogy, demonstration of knowledge of students, setting instructional outcomes, demonstrating knowledge of resources, designing coherent instruction, designing student assessments.

In observing the classroom environment, the principal should observe creating an environment of respect and rapport, establishing a culture for learning, managing classroom procedures, managing student behavior and organizing physical space.

In observing instruction, the principal should observe communication with students, using question and discussion techniques, engaging students in learning, using assessment in instruction, demonstrating flexibility and responsiveness (Danielson, 2013).

The focus of classroom instruction usually involves student achievement as measured by standardized tests but larger sets of assessments related to what students can do with their learning in authentic settings. In such classroom, there is a need to focus ongoing observations on actual student work.

A focus on how students have performed or scored on past tests, how to diagnose their curriculum performance, and how to plan changes in the duration, content, and methods of classroom instruction are targets for classroom improvement (Glickman, 2002).

Assisting Classroom Instruction

T he principal should conduct ***clinical supervision*** which focuses on improving teaching performance by analyzing teaching through sequential steps. The supervisory process is centered primarily on the analysis of instruction. The teachers should learn specific intellectual and behavioral skills to improve instruction. The principals should take an ***inquiry approach*** to talk with teachers. This approach includes behavior whose purpose is to learn what others think, know, want, or feel.

Supervisors should take responsibility for helping the teachers to develop skills for analyzing the instructional process based on systematic data. Supervisors should emphasize what and how the teacher teaches to improve instruction. Planning and analysis should center on making and testing instructional hypotheses based on observational evidence. Conferences should deal with a few instructional issues that are important, relevant to the teacher and amenable to change. ***Making suggestions***, proactively giving advice for the improvement of instruction is one central and powerful element of principals' verbal interaction with which teachers strongly enhance teachers' reflection and reflectively inform instructional behavior. By visiting classrooms and subsequently ***giving feedback*** to teachers, the principals should engage in thoughtful discourse with the teacher about what was observed.

The feedback conference should concentrate on constructive analysis. Supervision is a dynamic process of give-and-take in which supervisors and teachers are colleagues in search of mutual educational understanding. Individual teachers have both the freedom and the responsibility to initiate issues, analyze and improve their own teaching style, and develop personal teaching styles (Weller, 1977 as cited in Hopkins and Moore, 1994).

The principals should encourage ***peer coaching*** to reflect on current practices: expand, refine and build new skills, share ideas, teach one another (Robbins, 1991). Fellow teachers, as each other's colleagues, can conduct cycles of clinical supervision with each other along with the overall coordination of a facilitator (Glickman, 2002). The conversation will provide both suggestions about what the teacher is doing well and should continue to do, ideas and critiques about teacher inconsistencies and areas for change.

The study groups mustfocus on improvements to learning in their own classrooms and follow or modify a generic action research sequence. To be effective, each action research team should support a common focus on improvements in certain areas of standards and achievements, such as writing, critical thinking skills, and so on. Plans of action should include how to assist each other and what information to collect on student performance that would demonstrate concrete evidence of progress.

The principals should ***solicit teacher's advice and opinions*** about how to improve classroom instruction which enhance their instructional leadership role in the school.

Teachers' Professional Development

The teacher is the central figure in school effectiveness and improvement. Therefore, the development of the staff is perceived to be the best approach for leading the school towards better achievement. Principals should use the following strategies to promote teachers' professional growth.

Emphasizing the study of teaching and learning

The principals should inform faculty members of current trends and issues to foster innovation in teaching (methods, materials, technology) and increase student learning. The principals should distribute educational journal articles containing information relevant to classroom teaching and the specific needs and interests of teachers. They also should provide the teachers with information about workshops, seminars, and conferences related to instruction and encourage them to attend.

Supporting collaboration efforts among educators

Principals should support the development of formal collaborative structures among teachers through the use of inter- and intradepartmental and grade-level structures, teacher-collaborative structures to work together regularly on instructional issues. They should provide planning time as one major way to encourage the development of formal instructional and curricular collaboration among teachers. They also should encourage teachers to use informal collaboration arrangements.

Developing coaching relationships among educators

Principals should actively encourage teachers to visit the classrooms of exemplary teachers, asked exemplary teachers to serve as models to other teachers, and encouraged teachers to make presentations within their schools and district and at professional conferences. For purposes of professional growth, the principals should encourage teachers to visit other schools to observe classrooms and programs.

Using Inquiry to Drive Staff Development

An essential part of staff development is training in collection and analysis of data about teachers' training. The principals should operate staff development as a large-scale action research project.

Providing Resources to Support Growth and Improvement

The principals should develop faculty by providing essential resources that greatly enhance teachers' growth, classroom teaching, and student learning. In order to ensure the effective implementation of high-quality professional development, the principal must allocate and provide resources.

Principal Modeling

The principals, on occasion, should actually teach during classroom visits in order to model good instruction. Such modeling will not be considered intrusive when the principals cultivate respectful and trusting relationships with teachers (Blasé and Blasé, 2004).

Applying the principles of adult growth, learning, and development

The principals must understand that teachers are the adult learners who need to be self-direct, free and autonomous in their own learning. With the understanding of self-directed learning, teachers should be allowed to involve in planning their own professional development. The teachers should be allowed to determine what direction their professional development will take (Trotter, 2006).

Professional development must strive to help teachers learn to talk about their practice and experiences. It must enable teachers to share their knowledge of experience with one another. Then, these experiences must be effectively generalized into applicable concepts for other teachers (Riley & Roach, 2006).

Definition of Key Terms

(1) Instructional leadership is divided into two as broad and narrow aspects. In narrow terms, instructional leadership is defined as a function within management and actions directly related with teaching and learning. In broader aspects, instructional leadership is stated as the process of performing all leadership activities that may affect learning at school (Yang, 1996).

(2) **Creating an effective learning environment** refers to establishing physical, social and emotional learning environments that can sustain a strong culture of teaching and learning.

(3) **Managing people and resources** refers managing the resources (people, time, and finance, materials) strategically so as to obtain the optimal learning opportunities for the teachers and the students.

(4) **Creating a positive school climate** refers to establishing a sustainable, positive social climate in the school fosters youth development and learning necessary for a productive, contributive and satisfying life in a democratic society (Cohen, Mccabe, Michelli & Pickeral, 2009).

(5) **Observing Classroom Instruction** refers to observing many aspects of classroom teaching and learning such as teacher plans and behaviors, teacher-student interactions, student achievement, test score data and actual samples of student performances and achievements, and teaching demonstrations (Good & Brophy, 2000 as cited in Glickman, 2002).

(6) **Assisting classroom instruction** refers to giving assistance to teachers' instruction being cast as coaching, reflection, collegial investigation, study teams, explorations into uncertain matters, and problem solving (Blasé & Blasé, 2004).

(7) **Clinical Supervision** is supervision that focuses on improvement of teaching performance by analyzing teaching through a series of five sequential steps. They are pre-conference with teacher, observation, analysis and strategy, post observation conference and critique (Hopkins & Moore, 1994).

(8) **Peer coaching** is a confidential process through which two or more professional colleagues work together to reflect on current practices: expand, refine and build new skills, share ideas, teach one another, conduct classroom research or solve problems in the workplace (Robbins, 1991).

(9) **Professional development** refers to all the activities aimed at empowering an educator to perform his/her duties better or more efficiently and effectively towards achieving enhanced learner performance (Maponya, 2015).

Operational Definition

Instructional leadership practices refer to the activities for improving teaching and learning situations in the areas of creating an effective learning environment, improving classroom instruction and professional development of the teachers.

Methodology

Research Method

Quantitative and qualitative methods were used to examine the instructional leadership practices of the principals in Myawaddy Township, Kayin State.

Sample

This study included all teachers and the principals from five Basic Education High Schools in Myawaddy Township.

Table 3.1: Participants of Basic Education High Schools in Myawaddy Township

No.	Basic Education High Schools	No. of Principals	No. of Teachers
1.	School A	1	60
2.	School B	1	30
3.	School C	1	42
4.	School D	1	30
5.	School E	1	47
Basic Education High Schools		5	209

Instrumentation

The questionnaire was composed of 55 items which are the principals' instructional leadership practices: 24 items were related to *creating an effective learning environment*, 20 items were related to *improving classroom instruction*, 11 items were related to *professional development of the teachers.*

In the principals' questionnaire, gender, academic qualification, years of experience in education, years of experience as a principal, the subjects that the principals can teach well were asked for the demographic data of the principals. Open-ended questionnaires were asked the current instructional leadership practices of the principals.

Procedure

First of all, the relevant literature was reviewed. In order to acquire the required data, the instrument for instructional leadership practices of the principals was constructed under the guidance of the supervisor. The expert validity was asked from 8 expert educators from the Department of Educational Theory from Yangon University of Education. The pilot test was carried out at No. 2, Basic Education High School, Hlaing Thar Yar. After that, the field test was conducted in five Basic Education High Schools.

Analysis of Data

To analyze the quantitative data, descriptive analysis, the independent samples *t* test, and One-Way ANOVA were used. For qualitative study, the open-ended questions were categorized and analyzed according to the three areas of instructional leadership.

Findings

Quantitative Findings of the Instructional Leadership Practices of Basic Education High School Principals

Table 1: Mean Values and Standard Deviations of the Principals' Instructional Leadership Practices

No.	Instructional Leadership Practices Areas	Mean	SD	Level of Performance
1.	Creating an Effective Learning Environment	4.09	.67	Moderately High
2.	Improving Classroom Instruction	4.01	.79	Moderately High
3.	Teachers' Professional Development	3.78	.67	Moderately High
Instructional Leadership Practices		3.96	.71	Moderately High

1.00-1.49= Very Low 1.50-2.49=Moderately Low 2.50-3.49=Satisfactory
3.50-4.49=Moderately High 4.50-5.00= Very High

According to table 1, the instructional leadership practices of the principals of Basic Education High School in Myawaddy Township were at moderately high level (*M*=3.96).

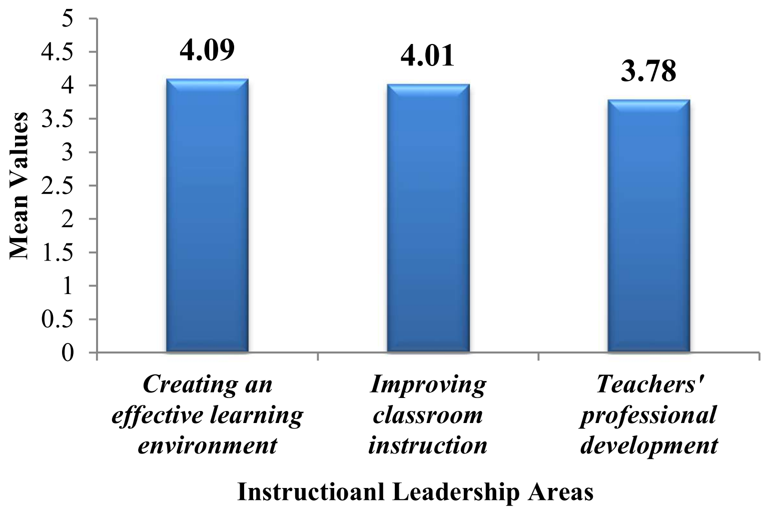

Figure 1: Instructional Leadership Practices of the Principals

Table 3: Independent Samples *t* Test Results of Instructional Leadership Practices of the Principals Grouped by the Subjects the Principals Can Teach Well

Instructional Leadership Practices Area	Teaching Subjects	N	Mean	SD	*t*	*df*	*p*
Creating an Effective Learning Environment	arts science	62 147	4.43 4.08	.56 .73	3.38	207	.001**
Improving Classroom Instruction	arts science	62 147	4.27 3.91	.65 .86	2.97	207	.003**
Teachers' Professional Development	arts science	62 147	4.06 3.66	.65 .86	3.66	150.13	.000***

**p*<.05, ***p*<.01, ****p*<.001, *ns*=not significant

According to Table 3, there were significant differences in all areas of instructional leadership practices according to the subjects they can teach well. The group of principals who can teach arts subjects performs better than the group of principals who can teach science subjects very well ($p<0.001$).

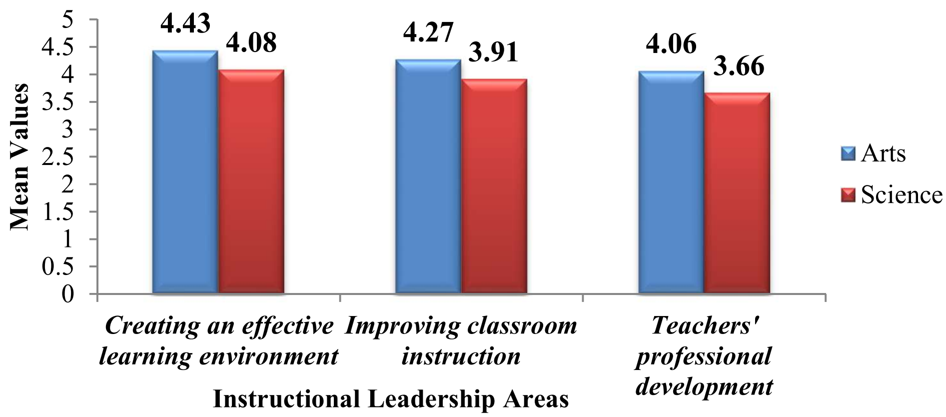

Figure 2: Comparisons of Instructional Leadership Practices Grouped by the Subjects the Principals Can Teach Well

Table 4: Mean Values and Standard Deviations of the Areas of Instructional Leadership Practices of the Principals Grouped by Schools

Instructional Leadership Practices Areas	Schools	N	Mean	SD
Creating an Effective Learning Environment	A	60	4.43	.55
	B	30	3.87	.85
	C	42	3.94	.86
	D	30	4.15	.60
	E	47	4.30	.52
Improving Classroom Instruction	A	60	4.27	.64
	B	30	3.38	.89
	C	42	3.82	.90
	D	30	3.95	.83
	E	47	4.33	.57
Teachers’ Professional Development	A	60	4.06	.64
	B	30	3.34	.86
	C	42	3.57	.99
	D	30	3.61	.81
	E	47	3.99	.66

Statistically significant differences were found in all areas of instructional leadership practices. For creating an effective learning environment, $F(4,204) = 5.50$, $p<0.001$. For improving classroom instruction, $F(4,204) = 9.90$, $p<0.001$. For teachers' professional development, $F(4,204) = 6.23$, $p<0.001$ among five schools.

Table 5: One-Way ANOVA Results of Variance Summary Table for Instructional Leadership Practices of the Principals Grouped by Schools

Instructional Leadership Practices Areas	**Sum of Squares**	***df***	**Mean Square**	***F***	***p***
Creating an Effective Learning Environment					
Between Groups	9.89	4	2.47	5.50	.000*
Within Groups	91.71	204	.45		
Total	101.59	208			
Improving Classroom Instruction					
Between Groups	22.38	4	5.59	9.90	.000*
Within Groups	115.29	204	.57		
Total	137.65	208			
Teachers' Professional Development					
Between Groups	15.34	4	3.84	6.23	.000*
Within Groups	125.52	204	.62		
Total	140.86	208			

Table 6: Tukey HSD Results Showing Multiple Comparison of Instructional Leadership Practices of the Principals in the Area of Creating an Effective Learning Environment Grouped by Schools

Instructional Leadership Practices Area	(I) school	(J) school	Mean Difference	Std. Error	***p***	95% Confidence Interval	
						Lower Bound	Upper Bound
Creating an Effective Learning Environment	A	B	.57*	.15	.002*	.15	.98
		C	.49*	.14	.003*	.12	.86
		D	.28	.15	.326	-.13	.70
		E	.14	.13	.838	-.22	.49

*. The mean difference is significant at the 0.05 level.

Table 7: Tukey HSD Results Showing Multiple Comparison of Instructional Leadership Practices of the Principals in the Area of Improving Classroom Instruction Grouped by Schools

Instructional Leadership Practices Area	(I) school	(J) school	Mean Difference	Std. Error	***p***	95% Confidence Interval	
						Lower Bound	Upper Bound
Improving Classroom Instruction	A	B	.89*	.17	.000*	.43	1.35
		C	.45*	.15	.025*	.04	.87
	B	D	-.57*	.19	.032*	-1.10	-.03
		E	-.95*	.18	.000*	-1.43	-.46
	C	E	-.51*	.16	.014*	-.95	-.07

*. The mean difference is significant at the 0.05 level.

According to Table 7, Post Hoc Tukey HSD Test indicates that school A's principal and school B's principal differed significantly in their instructional leadership practices of improving classroom instruction (p<0.001, d =1.16). Similarly, the principal of school A and the principal of school C differed significantly in their instructional leadership practices of improving classroom instruction (p<0.05, d =0.58). Also, the principal of school B and the principal of school D differed significantly in their instructional leadership practices of improving classroom instruction (p<0.05, d =0.66). Similarly, school B's principal and school E's differed significantly in their instructional leadership practices of improving classroom instruction (p<0.05, d=1.30).

Moreover, the principal of school C and the principal of school E differed significantly in their instructional leadership practices of improving classroom instruction (p<0.05, d =0.69).

Table 8: Tukey HSD Results Showing Multiple Comparison of Instructional Leadership Practices of the Principals in the Area of Teachers' Professional Development Grouped by Schools

Instructional Leadership Practices Area	(I) school	(J) school	Mean Difference	Std. Error	***p***	95% Confidence Interval	
						Lower Bound	Upper Bound
Teachers' Professional Development	A	B	.73*	.18	.000*	.24	1.21
		C	.49*	.16	.018*	.06	.92
	B	E	-.65*	.18	.005*	-1.15	-.14

*. The mean difference is significant at the 0.05 level.

According to Table 8, Post Hoc Tukey HSD Test indicates that the principal of school A and the principal of school B differed significantly in their instructional leadership practices of teachers' professional development (p<0.05, d =0.96). Similarly, the principal of school A and the principal of school C differed significantly in their instructional leadership practices of teachers' professional development (p<0.05, d =0.60).

Moreover, the principal of school B and the principal of school E differed significantly in their instructional leadership practices of teachers' professional development (p<0.05, d =0.86).

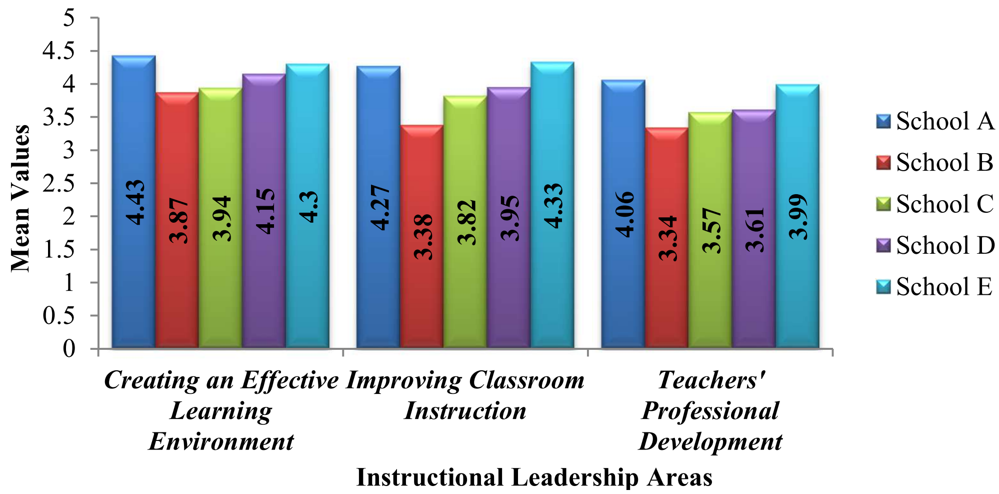

Figure 4.4: Comparisons of Instructional Leadership Practices Grouped by Schools

Qualitative Findings of the Instructional Leadership Practices of Basic Education High School Principals

For qualitative study, the instructional leadership practices of the principals were investigated through the open-ended questions.

Question 1. What are the activities you have been doing for your school for the development of an effective learning environment?

According the principals' responses for creating an effective learning environment, all (100%) principals did maintaining school plants, facilities supporting necessary instructional resources and cooperating with school faculties, parents and community for student development. Two (40%) principals carried out preparing and informing routine duties and instructional matters to students and teachers and giving educational talks and activities for students' whole development. However, there were one principal (20%) who nurtures positive relationships with teachers and students.

Question 2. What are you activities for the improvement of teaching and learning process?

For the second area of improving classroom instruction, four (80%) principals gave necessary support for students who are weak in learning. Two (40%) principal performed observing lesson planning preparation of teachers. One (20%) principal performed observing students' progress and achievement, discussion with teachers for instructional matters, students' participation, relationship between students and teachers, protecting instructional time, and rewarding outstanding teachers and students.

Question 3. What activities do you perform for the professional development of the teachers?

For third area of professional development, three (60%) of the principals encourage and foster cooperative and collaborative learning and attending workshops and seminars. Two (40%) principals provide resources for teachers' growth and development in their profession. One (20%) principal fostered coaching relationship.

Conclusion

It is the professional responsibility of the school principals to shape and form the best possible instructional program as they hold the most strategic position and implicit power to improve the quality of teachers' instruction and ultimately students' learning.

The first subscale of the first area of instructional leadership is *managing people and resources*. The participants rated the principals' performance at *moderately high level* for this subscale. *Creating a positive school climate* is the second subscale of the first area of instructional leadership. In this area of instructional leadership, the principals' performance was rated at *moderately high level* by the participants.

On the other hand, according to the principals' responses for creating an effective learning environment, the principals' performance were very strong in maintaining school plants and facilities, supporting necessary instructional resources and cooperating with school faculties, parents and community for student development. However, the principals' performance were weak in preparing and informing routine duties and instructional matters to students and teachers and giving educational talks and activities for students' whole development. The principals were weak in nurturing positive relationships among students, teachers and faculties. In general, it can be said that the principals could create an effective learning environment although their practices were weak in certain activities in this area.

The second area of instructional leadership is improving classroom instruction. The first subscale of this area is *observing classroom instruction.* The participants in this study rated that the principals' performance was at *moderately high level* in observing classroom instruction. Among all the practices, the principals perform the activity of checking teachers' lesson plans and notes regularly as it is one of the prescribed activities for the principals. According to principals' responses, most of the principals gave necessary support for students who are weak in learning. However, the principals were weak in their performance of observing students' progress and achievement, students' participation, relationship between students and teachers. Most important of all, the principals' performances were very weak in observing teaching process (teaching methods and classroom management). Thus, most of the principals were weak in performing certain important tasks for observing classroom instruction.

The second subscale for the second area of instructional leadership practices is assisting classroom instruction. The participants in this study rated that the principals' performance was at *moderately high level* in all the practices of assisting classroom instruction. According to principals' responses, most of the principals' performances were weak in the discussion with teachers for instructional matters, protecting instructional time, rewarding outstanding teachers and students, analyzing teachers' performance and giving necessary feedbacks.

So, it can be regarded that the principals' performance were weak in certain important activities for assisting classroom instruction.

As the principals reached the leadership position from the teaching position, they had to shift the focus of their major responsibilities from a specific classroom to a wider realm of endeavor. For improving classroom instruction, the principals need to increase not only their knowledge and understanding of how children learn and develop, but also to understand how adults grow, develop and learn. Next, the principals should improve their knowledge and skills of the subject matters, teaching methodology, techniques to solve the instructional problems, and curriculum change.

The third area of instructional leadership is professional development of the teachers. The principals' performance in this area was at *moderately high level* as rated by the participants. According to the principals' responses, the principals' performances were quite strong in encouraging the teachers to attend the workshops and seminars for improving their teaching. Most of the principals provide resources for teachers' growth and development in their profession and foster cooperative and collaborative learning. However, the principals' performances were very weak in fostering coaching relationship, informing the teachers with the current trends and issues in education, encouraging innovation, and model teaching. Therefore, it can be concluded that most of the principals' performance were quite weak in effective professional development activities as they are unfamiliar with the knowledge of these techniques and properly trained to do these activities.

The traditional programs such as workshops, seminars, refresher courses are only available for the educators (both school principals and teachers), they should not be conducted as 'one-shot' experiences but providing follow-up analysis and feedback. The principals should perform action research in their schools to assess the strengths and weaknesses of the teaching and learning process and seek opportunities to fix the weaknesses and improve the strengths.

In examining the instructional leadership practices according to their personal factors, there were significant differences between the principals according to the subjects they can teach well. The principals who had more knowledge, experiences and skills in teaching are more successful in practicing their instructional leadership.

In the study of the variations of instructional leadership practices among the schools, there were significant differences among the schools located in downtown area of Myawaddy Township and the school which are located in outer suburbs of Myawaddy Township. School A and School E are in higher performance in all the three areas of instructional leadership where the economic conditions of the students' families as well as community support, transportation, and security for the teachers and students are in good condition.

There was a problem of having not enough teaching staffs in the schools where the transportation is difficult. These schools should be provided enough teaching staffs. The Basic Education High Schools are complex organizations so there are heavy workloads for the principals. The principals can solve these problems by developing the leadership potentials of their colleagues and distributing the leadership responsibilities to them.

Finally, there would not be effective instructional leadership by the principals unless they do not possess leadership knowledge and skills to do so. There should be the professional courses for the principals that include the knowledge of teaching and learning process, leadership and management theories, current and suitable practices of professional development of teachers and standards for what principals should know and be able to do for providing the students with the best possible and right education system.

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READINESS LEVEL OF KINDERGARTEN CHILDREN*

Shwe Yee Win[1], Aye AyeMyint[2]

Abstract

The primary purpose of this study is to examine the readiness level of kindergarten children to find out the various factors that related to readiness for schooling. Descriptive questionnaire survey method and cross-sectional approach were used in this study. A total of 240 kindergarten students participated in this study. Students from urban areas have higher readiness skills than those from rural areas. Boys have higher verbal skills and lower visuomotor skills than girls. Attending preschool is the only predictor for verbal skill. The higher the father's education, the higher the readiness level of children. But the younger the mother's age, the higher the readiness level of children. Furthermore, age of children can be the predictor of visuomotor skills but it has the less beta value then other predictors. With regard to the whole readiness test, the results revealed that the age of kindergarten children, their father's education and attending preschool were significantly related with the readiness level of kindergarten children although children's age is not relatively the best predictor for children's readiness level.

Keyword: Readiness Level, Verbal skills, Visuomotor skills

Introduction

Readiness is any aspect of physical, mental, emotional or experiential maturity which is requisite for the learning activities. Readiness level is a good indicator which is closely related future performance and achievement of the individual concerned. So it is imperative for the parents to train their children to get to satisfactorily required level of readiness according to their age and to create a conducive and stimulating environment for their children.

Significance of the Study

The current fashion among the parents is a strong desire of sending their children to school before school admission age. In considering school admission problems, readiness level of children should be taken into account seriously in addition to age demarcation. The prevailing system of admission

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of children to school is totally based only on age with assumption that children will be ready for schooling by the age of five years.

Therefore in considering for school admission, in addition to age factor, other necessary traits and skills must be taken into account. Most of the teachers widely accepted that the children who have reached the year of five will have certain level of maturity and are ready to learn. Parents and teachers expected all children to profit equally well under the provision of the same instructional materials and methods.

With the help of verbal and visuomotor test, the teacher can arrange and manage the classroom setting and learning situations to meet the needs of the children. Therefore the readiness level of the children to enter primary level become more complicated and higher than that was required past few decades. Hence, the teachers should know the child's readiness level and basic requirements of schooling for their progress in academic achievements. But there is no empirical evidence to show that children of five years of age have developed all the necessary traits and skills for schooling. Children of the same age may have different levels of readiness for schooling.

Although a child's readiness for school can be viewed as a complex interplay between the child's entry skills, Kindergarten Diagnostic Tests Scores are among the best predictors of later academic performance (Snow, Burns, & Griffin, 1998). Accordingly, by the use of KDI, the researcher tries to investigate the readiness levels of Myanmar kindergarten children and explore how different in the readiness level of kindergarten children between children from urban and rural areas.

Purpose of the Research

(1) To examine the readiness level of kindergarten children

(2) To compare the readiness level of kindergarten children from urban and rural areas

(3) To find out the various factors that related to readiness for schooling

Definitions of Key Terms

School readiness: School readiness refers to the child's attainment of a certain set of emotional, behavioral and cognitive skills needed to learn, work, and function successfully in school (Dinwiddie, 1999).

Readiness level: Readiness level is a good indicator which is closely related to the future performance and achievement of the individual concerned (Dinwiddie, 1999).

Review of Related Literature

The concept of readiness can be related to achievement in various school subjects and at various levels of the curriculum. "Traditionally, however, readiness refers to the intellectual and social characteristics of kindergarten and first grade children. Readiness may be defined as a general responsiveness to instruction or as specific intellectual abilities that are predictive of the development of reading or of arithmetic skills" (Leton & Rutter, 1973).

Readiness as defined by Ausubel (1959) refers to "the adequacy of existing capacity in relation to the demands of a given learning task." "Generally, readiness refers to the capacity for meeting successfully certain expectancies or for achieving particular levels of performance" (Brandt, 1971).

Characteristics of School Readiness

Stated in simple terms, school readiness means that a child is ready to enter a social environment that is primarily focused on education. Research has suggested that many aspects of children's lives influence their preparation for formal school learning, including cognitive, social, emotional, and motor development, and, most importantly, early home, parental, and preschool experiences. Consideration of school readiness must take into account the range and quality of children's early life experiences.

The following list of behaviors and or characteristics are often associated with early school success:

1. Ability to follow structured daily routines.

2. Ability to dress independently.
3. Ability to work independently with supervision.
4. Ability to listen and pay attention to what someone else is saying.
5. Ability to get along with and cooperate with other children.
6. Ability to play with other children.
7. Ability to follow simple rules.
8. Ability to work with puzzles, scissors, coloring, paints, etc.
9. Ability to write their own name or to acquire the skill with instruction.
10. Ability to count or acquire the skill with instruction.
11. Ability to recite the alphabet (or quickly learn with instruction).
12. Ability to identify both shapes and colors.
13. Ability to identify sound units in words and to recognize rhyme.

Parent and Family Influences on School Readiness: Family environment is very important in shaping children's early development. Some family factors that can influence school readiness include: Low family economic risk: Poor readiness for school is often associated with poverty. Stable family structure: Children from stable two -parent homes tend to have stronger school readiness than children from one -parent homes and from homes where caregivers change frequently. Enriched home environment: Children from homes where parents talk with their children, engage them in conversation, read to them, and engage in forms of discipline such as time-out that encourage self-discipline have stronger readiness skills.

What parents can do to help prepare children for school: A great deal of variability exists in developmental and skill levels within young children. This is normal, and many children will not have developed to the level of others at the same age. Nevertheless, parents can help their children develop the skills they will need to be ready for school. The following list is a collection of activities that parents can do with their children to increase their child's general readiness for school:

- Read books to and with your child.
- Spend time with your child, including playing, cuddling, and hugging.
- Create and enforce a routine within your home that your child needs to follow (i.e., times of meals, naptimes, and bedtimes).
- Take time to talk to your child.
- Encourage and answer questions from your child.
- Engage in informal reading and counting activities at home.
- Promote your child's cognitive development by showing and encouraging your child to think about the world around them.
- Promote play that helps develop literacy skills, problem solving skills, creativity, and imagination.
- Familiarize children with the alphabet and with numbers.
- Ensure opportunity to develop social skills through playgroups or more formal preschool activities.
- Encourage behaviors that demonstrate respect and courtesy.
- Encourage children to accept responsibility and build competence through simple chores such as putting toys away and picking up clothes.

Methodology

Sample of the Study

To collect the required data, kindergarten children were selected as the participants of this study by using the random sampling technique. Total number of 240 students was involved as the participants in this survey.

Instrumentation

Readiness tests such as KDI, MRT and Lollipop Tests were reviewed thoroughly and adapted to meet the needs of the Myanmar children for writing test items. The readiness test is composed of 13 sub-tests and it has a total of 72 items. These are auditory memory, concept mastery, form perception, general information, number skills, verbal associations, verbal opposites, vocabulary, body awareness, visual discrimination, visual memory, visuomotor integration and gross motor skill.

Data Analysis and Research Findings

Analysis of Verbal and Visuomotor Skills of Kindergarten Children

In considering the readiness level, both verbal skills and visuomotor skills were taken into account. By using the descriptive procedure for the data obtained from readiness test for kindergarten children, the differences with regard to each subtest were explored. The verbal and visuomotor skills of kindergarten children can be analyzed and revealed the differences of readiness level among them (see Table 1 and Figure 1).

Table 1: Means and Standard Deviations for Readiness Level of Kindergarten Children

Types of Skills	Mean	Standard Deviation	Mean Percent
Auditory memory	4.73	.61	94.6 %
Concept mastery	3.36	1.09	67.2 %
Form perception	4.23	.91	84.6 %
General information	4.64	.68	92.8 %
Number skill	4.07	.99	81.4 %
Verbal association	4.82	.42	96.4 %
Verbal opposite	4.50	.76	90 %
Vocabulary	4.90	.35	98 %
Body awareness	3.30	2.07	47.1 %
Visual discrimination	4.70	1.28	78.3 %
Visual memory	10.75	2.55	89.6 %
Visuomotor Integration	1.37	1.07	27.4 %
Gross motor	4.53	.70	90.6 %

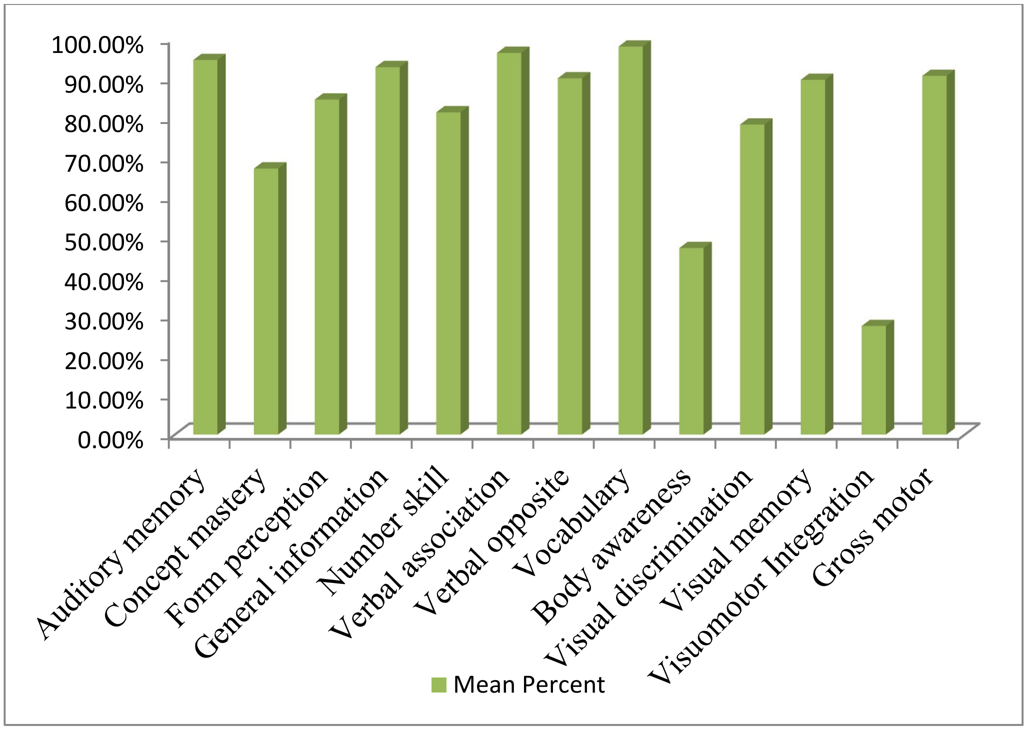


Figure 1: Mean Percent Comparisons for Each Readiness Skill of Kindergarten Children

Based on the descriptive statistics shown in Table 1, the mean percentage for vocabulary ability of kindergarten children was the highest (98%) and that for other skills was also high except visuomotor integration. In visuomotor integration skills, the mean percentage was the lowest (27.4%). That is why the majority of children have not still reached the satisfactory level of visual perception and motor control.

The subtest of body awareness in which one of the items is to draw a picture of a person, most of the children cannot draw well a picture of a person with body parts such as head, eyes, mouth, nose, ears, neck, body, arms, hands and legs. The ability of detail drawing and skill by which a child draws a man, boy, girl or woman indicates the stage he has reached in perception and fine motor control. The children's drawings are classified into five categories such the criteria as incomplete, below average, average, above average and superior. Results are as shown in Figure (2).

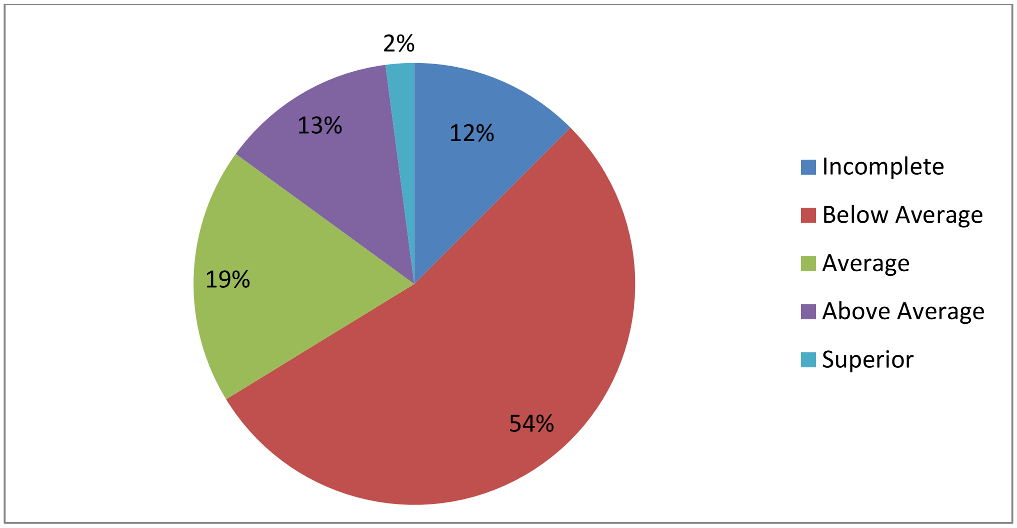
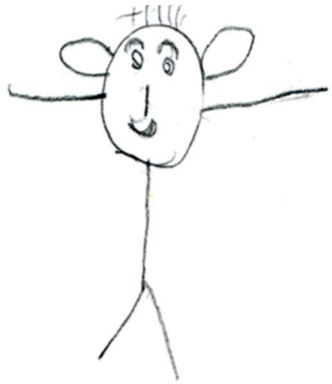


Figure 2: Percentages of Each Category in Body Awareness Subtest

Sample drawings of children's for various categories (superior (2%), above average(13%), average(19%), below average(54%) and incomplete (12%)) of drawing ability are shown below.

Superior **Above Average** **Average**

Below Average **Incomplete**



Comparison of Readiness Level of Kindergarten Children by Areas

To examine the readiness level of kindergarten children from urban and rural areas, descriptive statistics for verbal skills and visuomotor skills of kindergarten children for both areas were computed. The analysis revealed the differences in means and standard deviations of verbal and visuomotor skills by urban and rural areas (see Table 2).

Table 2 : Descriptive Statistics for Verbal and Visuomotor Skills by Areas

Areas / Skill	Urban (Yangon Region) (N=120)	Rural (Kyonpyaw) (N=120)
Verbal Skills	$\overline{X}$= 36.4 (2.49)	$\overline{X}$= 34.18 (3.66)
Visuomotor Skills	$\overline{X}$= 26.37 (2.70)	$\overline{X}$= 24.88 (4.85)

Note: The numbers in the parentheses are the value of standard deviations.

As hypothesized, mean differences were found concerning verbal and visuomotor skills as shown in Table 2. It showed that the mean scores of students from urban areas are higher than that of those from rural areas in both verbal and visuomotor skills. Moreover, the independent sample t-test was used to examine whether these differences are significant or not.

Table 3: The Results of Independent Sample t-test for Readiness Skills by Areas

Readiness Skills	t	df	sig (2-tailed)	Mean Difference
Verbal Skills	5.52	238	**.000**	2.23
Visuomotor Skills	2.93	238	**.004**	1.49

The results of t-test (see Table 3) confirmed that in verbal and visuomotor skills, there is statistically significant difference between urban (Yangon Region) and rural (Kyonpyaw) areas ($p<0.01$). It is said that kindergarten children from urban areas have higher readiness level than those from rural areas in terms of verbal and visuomotor skills (see Figure 3).

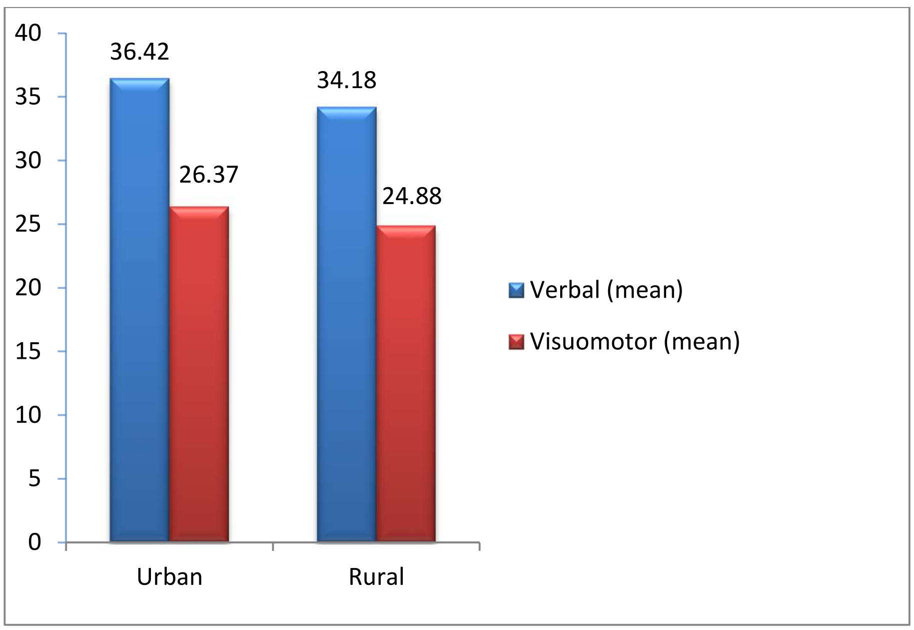


Figure 3: Mean Comparison for Verbal and Visuomotor Skills of Kindergarten Children by Areas

The Relation Between Verbal Skills and Personal Factors of Children

In order to find out personal predictors that related to readiness level of verbal skills (RL (V)) and visuomotor skills (RL (VM)), simultaneous multiple regression will be used.

Table 4: Simultaneous Multiple Regression Analysis Summary for Personal Predictors of Verbal Skill

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	33.958	1.528		22.229	.000
age level	.266	.354	.048	.753	.452
father's job	-.148	.168	-.065	-.882	.379
mother's job	-.221	.125	-.115	-1.770	.078
father's education	.396	.211	.155	1.878	.062
father's age	.143	.237	.057	.601	.549
mother's age	-.095	.263	-.034	-.360	.719
Siblings	.076	.183	.028	.416	.678
Preschool	1.627	.517	.237	3.145	**.002**

It was found that there was the significant difference between such variable as attending preschool and verbal skills ($p< 0.01$). Attending preschool (P) is only the best predictor for verbal skills, $\beta = 0.24$, $p = 0.002$, $p < 0.01$ in positive direction. This model can be defined as in the following equation:

RL (V) = 33.96 + 1.63P

Note: RL (V) = Readiness Level of verbal skills, P = Attending Preschool

And then, other predictors for visuomotor skills are also investigated (see table 5).

Table 5: Simultaneous Multiple Regression Analysis Summary for Personal Predictors of Visuomotor Skill

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	21.533	1.830		11.76	.000
Father's education	.821	.253	.267	3.24	.001
Mother's age	-.729	.315	-.215	-2.31	.022
Age level	1.076	.424	.161	2.53	.012

The results revealed that the age of kindergarten children (A), their father's education (FE) and mother's age (MA) were significantly related with the visuomotor skills of kindergarten children, for father's education, $\beta = 0.27$, $p = 0.001$, $p < 0.01$, for mother's age, $\beta = -0.22$, $p = 0.022$, $p < 0.01$ and for children's age, $\beta = 0.16$, $p = 0.01$, $p < 0.01$. Then the model can be defined as in the following equation:

$$RL\ (VM) = 21.53 + 0.82\ FE - 0.73MA + 1.08A$$

Note: RL (VM) = Readiness level of visuomotor skills

FE = Father's education

MA = Mother's age

A = Children's age

According to above equation, the higher the father's education is, the higher the readiness level of children. But the younger the mother's age is, the higher the readiness level of chidren. This may be because the young mothers are more active, alert and healthier than old mothers so as to strengthen the visuomotor skills of children. Age of children was the predictor of visuomotor skills but it has the less beta value ($\beta = 0.16$) than other predictors. With respect to readiness level of both verbal and visuomotor skills, simultaneous multiple regression was conducted. (See Table 6)

Table 6: Means, Standard Deviations and Inter-correlations for Readiness Skills and Predicator Factors

Variables	Mean	SD	Father's Education	Attending Preschool	Age level
Readiness level	60.92	6.209	0.384**	0.355**	0.003
Predictor Factors					
1.Father's Education	3.79	1.299	-	0.588**	-.262**
2.Attending Preschool	.63	.484	-	-	-.202**
3. Age level	1.56	0.597	-	-	-

** P<0.01

Table 6 showed that father's education, age level and attending preschool are significantly correlated with the kindergarten children's readiness level. Preschool experiences were also affective for the kindergarten children's readiness level. Those who attended preschool before entering kindergarten have significantly high readiness levels. Preschool experiences can benefit the readiness level of kindergarten children.

As expected that there may be other factors which related to readiness level of kindergarten children, there are two other predictor factors that are highly related to readiness level. Therefore, to compare the strength of these predictors the beta coefficients were analyzed. The values of beta coefficients are presented in Table 7.

Table 7: Simultaneous Multiple Regression Analysis Summary for Personal Predictors of Readiness level

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	56.941	2.287		24.902	.000
Father's education	1.282	.637	.268	2.012	.045
Preschool	2.579	.975	.201	2.645	.009
Age level	1.275	.634	.123	2.010	.046

All of the factors depicted in Table 7 are either statistically significant and, therefore, associations with readiness are statistically strong.

The results revealed that the age of kindergarten children (A), their father's education (FE) and attending preschool (P) were significantly related with the readiness level of kindergarten children although children's age was not relatively a good predictor for children's readiness level. Then the model can be defined as in the following equation:

$$R\,L = 56.94 + 1.28FE + 2.58P + 1.28A$$

Note: RL = Readiness level

FE = Father's education

P = Attending preschool

A = Children's age

These findings showed that readiness level was dependent on father's education, attending preschool and age. Children who have high readiness levels can achieve success in their later academic performance. Readiness skills are the best predictors for later academic performance.

5. Conclusion

The National Education Goals Panel (1997) outlined five dimensions of school readiness associated with (a) health and physical development, (b) emotional well-being and social competence, (c) approaches to learning, (d) communication skills, and (e) cognition and general knowledge. Parents are calling for more structured learning (Garrett, 2001). For instance, they ask that long day care centers have pre-school programs with an emphasis on pre-reading and pre-numeracy skills to ensure that their children are 'ready for school' and are not falling behind in a knowledge acquisition race, which is starting ever younger. On the other hand, researchers and early childhood educators are recognizing the importance of less structured aspects of early childhood learning on children's readiness for school.

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A STUDY OF THE PERCEPTIONS OF HIGH SCHOOL STUDENTS ON MATHEMATICS LEARNING ENVIRONMENT

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Abstract

The major purpose of this study was to investigate different factors that affect the attitudes and learning environment perceptions of high school mathematics students. For the purpose of measuring students' perceptions of learning environment, it was observed that the better the students' perceptions of learning environment, the higher the students' mathematical attitudes would be. Quantitative approaches were used in this study. A total of 629 Grade 10 students from six selected schools in Yangon and Ayeyarwaddy regions were participated in this study. As the research instruments, What is Happening In This Class Questionnaire (WIHIC) and Test of Mathematics Related Attitudes Questionnaire (TOMRA) defined by Fraser (2007) were used in this research. Subjects were evaluated using the What Is Happening In This Class Questionnaire (WIHIC) and Test of Mathematics Related Attitudes Questionnaire (TOMRA) including 49 items to assess high school students' perceptions of mathematics learning environment.

In this research, descriptive statistics, independent sample t-test and analysis of variance (ANOVA) were used. As a result of this study, it was found that the female students have better perceptions of mathematics learning environment than male students. It can be observed that there was significant difference in the students' perceptions of learning environment between schools. And then, students were different in their perceptions of learning environment between Yangon and Ayeyarwaddy Region. There were also significant difference in the students' perceptions of learning environment and mathematical attitudes according to their combinations. It can be concluded that student's perceptions of learning environment were positively related with their mathematical attitudes.

Key words : Learning environment, Attitude, Perception

Introduction

In the modern world, mathematics is being increasingly used in science, technology, industry, and education and economic. It is essential in public decision making and for participation in the knowledge economy. Mathematics classroom environment and mathematics achievement are some

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of the important mathematical constructs in teaching and learning of Mathematics in the classroom. An effective mathematics learning environment is one in which students and teachers interact in ways that allow students to have an opportunity to maximize how much they learn. Creating an interactive learning environment inside the mathematics classroom in which students are engaged in mathematics learning can be challenging. Learning environment can affect student behavior because students spend a lot of time at school. The classroom is the basic unit of organization of the educational system. Classroom is the most vital one for the transactional business going on between school and the society. Socially, the child is the product of environment. If the school is able to create a congenial, pleasant and favorable climate for learning, the child is likely to enjoy the schooling experience. (Sunitha, 2005).

Literature Review

Learning Environment

Learning environment refers to an environment experienced or perceived by teachers that supports positive learning outcomes. Creating and implementing a learning environment means careful planning for the start of the school year. The learning environment must be envisioned in both a physical space and a cognitive space. The physical space of the classroom is managed as the teacher prepares the classroom for the students. Teachers must also consider the cognitive space necessary for a learning environment. This cognitive space is based upon the expectations teachers set for students in the classroom and the process of creating a motivational climate.

Attitude

Attitude is a central part of human identity. Everyday people love, hate, like, dislike, favour, oppose, agree, disagree, argue, persuade etc. All these are evaluative responses to an object. Hence attitudes can be defined as a summary evaluation of an object of thought (Bohner & Wänke, 2002).They are inclinations and predispositions that guide an individual’s behavior and persuade to an action that can be evaluated as either positive or negative . Attitudes develop and change with time. According to multicomponent model of Attitude, attitudes are influenced by three components. They are cognitive (beliefs, thoughts, attributes), affective (feelings, emotions) and behavioural information (past events, experiences).

Students' attitude towards mathematics

Students' attitude towards mathematics has been a factor that is known to influence students' achievement in mathematics. When reviewing literature on students' attitude towards mathematics, it reveals that several factors play a vital role in influencing student's attitude. These factors can be categorized into three distinctive groups. Firstly, factors associated with the students themselves. Some of these factors include students' mathematical achievement score, anxiety towards mathematics, students' self efficacy and self concept, extrinsic motivation and experiences at high school. Secondly, the factors that are associated with the school, teacher and teaching.

Perceptions

Perception is the process or the capability to attain awareness and understand the environment surrounding us by interpreting, selecting and organizing different type of information. Perception that it refers to evaluative concepts encompassing opinions and beliefs.. In the dictionary of psychology, it is defined as (1) the process of knowing objects and objective events by means of the senses; and (2) an intuitive awareness of truth or immediate belief about something.

Students' Perceptions of Classroom Environment

According to Fraser (2000), students have spent approximately 20,000 hours in classrooms by the time they finish their university education. This time devoted to schooling is focused mainly on the academic achievement of students. Teachers, students and school face a variety of problems when realizing a productive learning environment for all these hours, such as lack of choice and opportunity in educational programs, lack of funding, dissatisfied and burnt-out teachers, problems in teacher quality, low grades etcetera.

Method

This study aims to present about the research methods and procedures that applied in this study in assessing high school students' perceptions of learning environment , their mathematical attitudes and their demographic factors.

Sample of the study

Participants of this research were Grade 10 students from Yangon and Ayeyarwaddy regions by using random sampling technique, in the academic year of 2013-2014. The total number of the participants were 629 (Male 295, Female 334).

Research Instrument

The first instrument, What Is Happening In the Class (WIHIC) was used to the participants of the study. The response type for each item is a five point Likert Scale. Based on past studies, Fraser (2007) developed a new learning environmental instrument named What Is Happening In This class? (WIHIC) which incorporates that have been used and proven to be significant predictors of learning outcomes. The six subscales (Student Cohesiveness, Teacher Support, Involvement, Task Orientation, Cooperation and Equity), was involved in WIHIC. The total items of WIHIC consisted of 24 items. The second instrument , Test of Mathematics Related Attitudes (TOMRA), was employed to the participants of the study. Test of Mathematics Related Attitudes (TOMRA) was modified by Fraser (2007).In this instrument, five subscales (Inquiry, Enjoyment, Leisure, Social and Career) were included. The total items of TOMRA were 25 items in the instrument. After testing the pilot study, Cronbach's alpha of the whole scale was 0.822. So, Cronbach alpha's value indicated that is satisfactorily reliable.

Procedure for Collecting Data

After preparing the questionnaire from the pilot study, data collection was conducted. The data was collected from BEHS 1 Dagon (East), BEHS 1 Tarmwe, BEHS 4 Alone in Yangon Region and BEHS 1 Malzali, BEHS 1 Inngapuu, BEHS 1 Kwinkauk in Ayeyarwaddy Region from the first week of December, 2013 to the first week of January, 2014. To get gender and subject specialization, data collection made between male and female in the arts and science section from all selected schools. The data were analyzed by descriptive analysis, independent sample t-test method, ANOVA method, correlation and Chi-square method.

Data Analysis and Result

Students' Perceptions of Mathematics Learning Environment from all Selected Schools

To investigate the students' perceptions of mathematics learning environment, descriptive statistics was carried out and the results were shown in table 1.

Table 1: Descriptive Statistics for Students' Perceptions of Mathematics Learning Environment

Subscales of Perceptions of Learning Environment and Mathematical Attitudes		**Mean**	**SD**	**Minimum**	**Maximum**
Perceptions of Learning Environment	Student Cohesiveness	13.210	1.252	9	15
	Teacher Support	15.820	2.040	8	20
	Involvement	25.400	4.052	11	35
	Task Orientation	12.350	1.544	4	15
	Cooperation	11.840	1.656	7	15
	Equity	16.290	2.248	8	20
Total		94.913	8.711	64	116
Mathematical Attitudes	Inquiry	13.620	2.497	6	20
	Enjoyment of Mathematics	23.480	2.573	15	34
	Leisure	17.900	2.620	10	48
	Social	15.850	2.180	9	25
	Career	7.300	1.624	3	10
Total		**78.154**	**7.047**	**58**	**114**

By using the data obtained from the selected schools, the students' perceptions of learning environment and mathematical attitudes can be estimated. According to the descriptive statistics, the mean and standard deviation of students' perceptions for the whole What Is Happening In this Class Questionnaire (WIHIC) is 94.912 and 8.711. It was clearly seemed that the students in this study have fairly good perception about the learning environment. Among them, the mean score of involvement is the highest and the second highest is equity. So, it was assumed that high school students from selected schools are satisfied with their class and participate actively in the class activities and the teacher always treats students equally in the classroom activities. And then the third highest was the mean score for teacher support, followed by student cohesiveness. Moreover, the mean and standard deviation for the whole Test of Mathematics Related Attitudes Questionnaire (TOMRA) is 78.154 and 7.047. Among them, the mean score of enjoyment of mathematics was the higher than that of other variables. It may be interpreted that students enjoy learning mathematics in the classrooms.

Comparison of Students' Perceptions of Mathematics Learning Environment by Gender

To find out the differences of students' perceptions on mathematics learning environment between male and female from the selected schools, descriptive statistics was made. The mean score of male and female students were shown in table 2.

Table 2: Means and Standard Deviations of Students' Perceptions of Mathematics Learning Environment by Gender

Variable	Gender	N	Mean	Std. Deviation
Perceptions of Learning Environment	Male	263	93.517	8.587
	Female	366	95.915	8.671
Total		**629**	**94.912**	**8.710**
Mathematical Attitudes	Male	263	77.643	7.587
	Female	366	78.522	6.624
Total		**629**	**78.154**	**7.046**

For perceptions of learning environment, the mean score of female was higher than that of male. So, it can be interpreted that the perceptions of the female students on learning environment were higher than that of male. For mathematical attitudes, the mean score of female was higher than that of male. After conducting the mean and standard deviation by gender, it was carried out the independent sample t-test to find out the significant difference in the students' perceptions on mathematics learning environment by gender.

Table 3: Results of Independent Sample t-test of Students' Perceptions of Mathematics Learning Environment by Gender

Variable	t	df	Sig (2-tailed)	Mean Difference
Perceptions of Learning Environment	- 3.435	627	.001	- 2.398
Mathematical Attitudes	- 1.545	627	.123	- .879

From the result of independent sample t-test, there was statistically significant difference in the students' perceptions of learning environment but there was no significant difference in their mathematical attitudes.

Students' Perceptions of Mathematics Learning Environment by Schools

In order to investigate whether there were significant differences in students' perceptions of mathematics learning environment by schools, descriptive statistics was done and it revealed the differences in mean scores of the perceptions of mathematics learning environment by schools was presented.

Table 4: Descriptive Statistics for Perceptions of Mathematics Learning Environment between Schools

Variable	Schools	N	Mean	Std. Deviation
Perceptions of Learning Environment	KwinKauk	100	98.850	6.949
	Malzali	100	92.550	9.342
	Inngapuu	100	98.900	7.018
	Alone	101	93.237	10.286
	Tarmwe	99	92.666	8.269
	Dagon	129	93.635	7.591
Mathematical Attitudes	KwinKauk	100	77.910	5.318
	Mazali	100	77.040	6.555
	Inngapuu	100	78.640	5.788
	Alone	101	78.326	9.163
	Tarmwe	99	79.616	7.750
	Dagon	129	77.573	6.913

Based on the result of table 4, it can be interpreted that the mean score of Inngapuu was the highest on the perceptions of learning environment over all schools. And then, Kwin Kauk was the second highest on perceptions of learning environment , followed by Dagon and Alone. The two lasted mean scores among schools were Tarmwe and Malzali. It could be concluded that students' perceptions of learning environment from Inngapuu were effective than other students. Moreover , mathematical attitudes of students from Tarmwe was the highest. Inngapuu was the second in mathematical attitudes, followed by Alone, Kwin Kauk, Dagon and Mazali. Then, it was computed ANOVA to find out whether there was significant difference in the students' perceptions of mathematics learning environment between schools. It can be observed that there was significant difference in the students' perceptions of learning environment at 0.01 levels but there was no significant difference in their mathematical attitudes.

Table 5 : ANOVA Results for Students' Perceptions of Mathematics Learning Environment Between Schools

Variable	Sum of Squares	df	Mean Square	F	Sig
Perceptions of Learning Environment	Between Group – 4691.518	5	938.304	13.608	.000
	Within Group – 42956.673	623	68.951		
	Total – 47648.191	628			
Mathematical Attitudes	Between Group – 411.789	5	82.358	1.667	.140
	Within Group – 30772.252	623	49.394		
	Total – 31184.041	628			

Students' Perceptions of Mathematics Learning Environment between Yangon and Ayeyarwaddy Region

After matching the students' perceptions by schools, it was found out the descriptive statistics for the student' perceptions of mathematics learning environment between Yangon and Ayeyarwaddy Region. The result of descriptive statistics was shown the following table 6.

Table 6: Means and Standard Deviations of Students' Perceptions of Mathematics Learning Environment Between Yangon and Ayeyarwaddy Region

Variable	Region	N	Mean	Standard Deviation
Perceptions of Learning Environment	Yangon	329	93.222	8.680
	Ayeyarwaddy	300	94.913	8.374
	Total	629	96.767	8.089
Mathematical Attitudes	Yangon	329	78.154	7.932
	Ayeyarwady	300	78.420	5.926
	Total	629	77.863	7.047

It can be assumed that the total mean score of students from Ayeyarwaddy Region was higher than that of students from Yangon Region in examining learning environment questionnaire. But, on the other hand, the mean score of students from Ayeyarwaddy Region was higher than that of students from Yangon Region in assessing mathematical attitudes. Moreover, it was calculated the independent sample t-test to see whether there was significant difference between Yangon and Ayeyarwaddy Region.

Table 7: Results of Independent Sample t-test of Students' Perceptions of Mathematics Learning Environment between Yangon and Ayeyarwaddy Region

Variable	t	df	Sig (2-tailed)	Mean Difference
Perceptions of Learning Environment	5.202	627	.000	3.545
Mathematical Attitudes	- .989	627	.323	- .556

The result of independent sample t-test indicated that there was significant difference in the students' perceptions of learning environment but there was no significant difference in their mathematical attitudes.

Students' Perceptions of Mathematics Learning Environment by Subjects

To assess whether the students have difference in selecting the subjects among them, descriptive statistics was calculated. The results were shown in table 8.

Table 8: Means and Standard Deviations of Students' Perceptions of Mathematics Learning Environment by Subjects

Variable	Subjects	N	Mean	Standard Deviation
Perceptions of Learning Environment	Science	319	95.720	8.323
	Arts	310	94.913	9.031
	Total		**94.123**	**8.711**
Mathematical Attitudes	Science	319	79.174	6.555
	Arts	310	78.154	7.392
	Total		**77.163**	**7.047**

It was observed that the total mean score of science was higher than that of arts in students' perceptions of mathematics learning environment in examining the questionnaire. Thus, the students' perceptions of mathematics learning environment who were studying in science were higher than that of arts. After conducting the mean and standard deviation by subjects, it was carried out the independent sample t-test to find out the significant difference in the students' perceptions on mathematics learning environment by subjects.

Table 9: Results of Independent Sample t-test of Students' Perceptions of Mathematics Learning Environment by Subjects

Variable	t	df	Sig (2-tailed)	Mean Difference
Perceptions of Learning Environment	-2.298	627	.022	-1.591
Mathematical Attitudes	-3.613	627	.000	-2.011

From the result of independent sample t-test, there were statistically significant difference in the students' perceptions of learning environment and mathematical attitudes.

Table 10: Chi-square Test Result for the Perceptions of Learning Environment and Mathematical Attitudes

	Value	**df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	60.107	4	.000
Likelihood Ratio	51.385	4	.000
Linear-by-Linear Association	46.673	1	.000
N of Valid Cases	629		

To investigate whether mathematical attitudes differ on perceptions of learning environment , a chi-square statistics was used. Table 10 showed the Pearson chi-square results and indicates that mathematical attitudes was significantly different on perceptions of learning environment

(χ^2 = 60.107, df = 4, N = 629, P< .000).

Table 11: ANOVA Results of Mathematical Attitudes by Perceptions of Learning Environment Level

	Sum of Square	**df**	**Mean Square**	**F**	**Sig**
Mathematical Attitudes	Between Groups-3166.832	2	1583.416	35.379	.000
	Within Groups-28017.210	627	44.756		
	Total-31184.041	629			

According to the result of table 11 , the observed F-value for the perceptions of learning environment level (df= 2,627) was 35.379 and the p-value was less than 0.001. The significant difference was found in mathematical attitudes by the perceptions of learning environment level at 0.001 level. The mean score of high perceptions of learning environment level was high in mathematical attitudes. It may be interpreted that the perception of an enjoyable learning environment was the high in mathematical attitudes.

To understand definitely, which particular level had significant difference in the perceptions of learning environment among other levels, the Post Hoc Tests by Turkey HSD Method was calculated.

Table 12: Results of Turkey HSD Multiple Comparisons for Mathematical Attitudes by the Perceptions of Learning Environment Level

	(I)Level	(J)Level	Mean Difference(I-J)	Pr>F
Mathematical Attitudes	High Group	Middle Group	4.805**	.000
		Low Group	7.923**	.000

Note: ** The mean difference is significant at 0.01 level.

Based on the results of table 12, it may be considered that the mean score of students from high group level of perceptions of learning environment was significantly higher than that from other two groups for that area, (middle group and low group) in the mathematical attitudes at 0.01 level. It may be remarked that if the students have good perceptions on learning environment, their mathematical attitudes will high.

Table 13: Inter-correlations for Learning Environmental Perceptions and Mathematical Attitudes of Students

Variables	PLE	IN	EM	L	So	C
PLE	-	.257**	.140**	.176**	.112**	.390**
IN		-	.171**	.208**	.128**	197**
EM			-	349**	.246**	.225**
L				-	.234**	.187**
So					-	.146**
C						-

**Correlation is significant at the 0.01 level (2-tailed).

Note: PLE =Perceptions of Learning Environment , IN = Inquiry, EM = Enjoyment of Mathematics, L = Leisure, So = Social, C = Career. As already mentioned above, perceptions of learning environment were positively related with mathematical attitudes .

Conclusion

The major purpose of this study was to investigate different factors that affect the attitudes and learning environment perceptions of high school mathematics students. For the purpose of measuring students' perceptions of learning environment, it was observed that the better the students' perceptions of learning environment, the higher the students' mathematical attitudes would be. As a result of this study, it was found that the female students have better perceptions of mathematics learning environment than male students. It can be observed that there was significant difference in the students' perceptions of learning environment between schools. And then, students were different in their perceptions of learning environment between Yangon and Ayeyarwaddy Region. There were also significant difference in the students' perceptions of learning environment and mathematical attitudes according to their combinations. It can be concluded that student's perceptions of learning environment were positively related with their mathematical attitudes.

Suggestion

The sample used in this research is from six selected schools of Yangon and Ayeyarwaddy region. To be more representative, more students from remaining schools should be participated in this study. In this study, the research tried to investigate the students' perceptions of mathematics learning environment in schools. Creating an effective learning environment is really important for students. So, the research is required to study the students' perceptions of classroom environment and their mathematical attitudes. It was also found that mathematical attitudes were more favorable in classrooms perceived as having more teacher support, task orientation and equity. Future research should incorporate structured interview and other qualitative data – collection techniques, as suggest by Tobin and Fraser (1998), in addition to questionnaires. According to Tobin and Fraser (1998), combining qualitative and quantitative research methods can help to provide a clearer understanding of the learning environment and enhance the information obtained from quantitative methods alone. The use of the combination of qualitative and quantitative methods in future is likely to enrich findings from the research. To overcome the limitation, future research should be undertaken with bigger and broader samples to improve confidence in the findings. Such studies could include samples from primary, secondary and college levels. It is also suggested that future studies include outcomes beyond student attitudes, such as academic achievement. Associations between learning environment and student outcomes could be investigated at different grade levels and for different learning areas.

Education in Myanmar is undergoing profound transformation. Critical within this process is the introduction of advanced educational techniques, improvement of the innovative skills of teachers, and the enhancement of the self-learning ability of students. All of the processes require evaluation at all levels of their development from policy formulation at government level through to implementation of the curriculum framework at the school and classroom levels. These processes require different approaches to evaluation. Research, involving the use of learning environment instruments, such as the WIHIC, could prove generally useful in evaluating the impact of these innovate curricula in terms of the learning environment created at the school and classroom level.

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THE VERBAL SHORT-TERM MEMORY AND READING ABILITY OF PRIMARY SCHOOL STUDENTS IN CHANAYETHARZAN TOWNSHIP

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Abstract

The main aim of this study is to investigate the effect of verbal short-term memory on primary students' reading ability. A total of 559 Grade 3 and Grade 5 students from eleven schools in Chanayetharzan Township, Mandalay Region were participated in this study. Quantitative approach was used in this study. Students' Verbal Short-term Memory was measured by "Verbal Short-term Memory tests" developed by Stanford-Binet Intelligence Scale: Fourth Edition (SB-IV). Researcher made reading ability tests (Myanmar and English) were used to measure primary students' reading ability based on the Metropolitan Achievement Tests (1978) and the Neale Analysis of Reading Ability (1989).

Results indicated that there was significant relationship between primary students' verbal short-term memory and reading ability. ANOVA results indicated that there were significant differences with regard to students' verbal short-term memory and reading ability by different schools. According to correlation analysis, students' verbal short-term memory were found to be significantly and positively correlated with their reading ability ($r = .664$, $p < .01$).In addition, multiple regression analysis showed that the students' verbal short-term memory was good predictor for their reading ability. Therefore, findings from this research may contribute to the educational field by providing recommendations for developing verbal short-term memory in students to support their reading ability.

Introduction

Educator must ensure that students attend to learning, attach new learning to previous learning, actively engage in learning, construct meaning and demonstrate their learning. All of this requires memory. Learning and memory are sensitive to the physical state of the learner. In 2002, Foster stated that there are four basic kinds of memory: sensory memory, short-term memory, working memory, and long-term memory.

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Verbal memory (VM) is a catchall phrase used to refer to memory for words and verbal items. Verbal short-term memory (VSTM) has been the subject of considerable psychological, neuropsychological and developmental research, culminating in successful theories such as the Phonological Loop of Baddeley.

Reading ability has a significant impact on all areas of academic learning. Poor reading skills at an early age can lead to an overall dislike of school and can increase the areas and can significantly impact on individual's education and future success (Ecklund and Lamon, 2008). Mann (1985) found that children who have had difficult learning to read often have poorer memory span than who succeed. The rationale for this research is based upon studies showing the importance of the relationship between STM and learning to read. Thus, measures of STM become important as predictors of children who will experience difficulty in school learning to read. Moreover, Sprugevica (2003) described that the other studies also have shown verbal short-term memory as a predictor of reading ability.

Purposes of the Study

The main purpose of this study is to investigate the effect of verbal short-term memory on reading ability of primary school students (Grade 3 and Grade 5) in Chanayetharzan Township. The specific objectives are as follows;

1. To investigate the relationship between primary students' reading ability and their memory for sentences, digits forward, digits backward and objects.
2. To explore the relationship between primary students' verbal short-term memory and their reading ability.
3. To observe the differences in primary students' verbal short-term memory and their reading ability based on grade and school.

Scope of the Study

A total of 559 Grade 3 and Grade 5 students from 11 randomly selected schools were participated in this study. The schools were located within Chanayetharzan Township, Mandalay Region. The participated students were selected from No. (1) Monastic School Nanthar, No. (2) Monastic School Ngarsoet, No. (3) Monastic School Myatheintan, No. (4) Monastic School Thingazar, No. (5) Monastic School Thayetpin, No. (6) Monastic School Akautwon, B.E.P.S (29), B.E.P.S(32), B.E.P.S(41), B.E.H.S(22) and B.E.H.S(23) in Chanayetharzan Township, Mandalay Region.

Definitions of Key Terms

1. **Verbal Short-term memory:** Verbal Short-term Memory refers to the extremely capacity limited information processing ability, containing all linguistic information that is in immediate consciousness (cited in Baddeley et al., 1998).
2. **Reading Ability:**It is an ability to read that is expected for a child of a given age and stage of development.

Review of Related Literature

Memory is a wonderful trait of human beings and it generally plays a very important role in learning process, literacy knowledge acquisition. According to Baddeley et al.'s (1975), verbal short-term memory is only as long as the number of words perceived in approximately 1.6 seconds. Verbal short-term memory is traditionally assessed using tasks that require the participant to recall a sequence of verbal information, such as digit span and word span (Baddeley et al., 1998).

Snow, et al. (1998) described that reading is a complex act. It involves multiple cognitive, emotional, and social abilities, each of which influences the beginning reader's success. Indeed, reading ability has a significant impact on all areas of academic learning. Poor reading skills at an early age can lead to an overall dislike of school and can increase the risk of drop out. Low literacy levels can also lead to underachievement in all academic areas and can significantly impact an individual's education and future success. Wilfong (2008) stated that students who struggle with reading benefit from individual reading instruction and extra reading time.

Children who are read more frequently at an early age enter school with larger vocabularies and more advanced comprehension skills (Mol &

Bus, 2011). The reader brings motivation to the reading experience in the form of purpose, interests, and self-regulatory skills. Motivation to practice reading is integral in improving reading skills. Heckman (2002) mentioned that learning to read is a fundamental right of children in a changing world. Therefore, to achieve at school and succeed in the world at large, children need to know how to read and write.

Method and Procedures

The main purpose of this study is to investigate into the verbal short-term memory and reading ability of primary school students (Grade 3 and Grade 5) in Chanayetharzan Township.

Participants

A total of 559 Grade 3 and Grade 5 students from 11 randomly selected schools were participated in this study. The schools were located within Chanayetharzan Township, Mandalay Region. The participated students were selected from No. (1) Monastic School Nanthar, No. (2) Monastic School Ngarsoet, No. (3) Monastic School Myatheintan, No. (4) Monastic School Thingazar, No. (5) Monastic School Thayetpin, No. (6) Monastic School Akautwon, B.E.P.S (29), B.E.P.S (32), B.E.P.S (41), B.E.H.S (22) and B.E.H.S (23) in Chanayetharzan Township, Mandalay Region. Table 1 illustrated the number of Grade 3 and Grade 5 students from selected schools in Chanayetharzan Township.

Table 1: Selected Numbers of Primary Students from Chanayetharzan Township

Name of Schools	Number of Students				Total
	Grade 3		Grade 5		
	Male	Female	Male	Female	
No.(1) Monastic School	14	11	14	8	47
No.(2) Monastic School	12	2	8	3	25
No.(3) Monastic School	2	_	11	2	15
No.(4) Monastic School	11	_	10	_	21
No.(5) Monastic School	11	5	8	8	32
No.(6) Monastic School	13	_	10	_	23
B.E.P.S (29)	13	16	22	21	72
B.E.P.S (32)	21	25	15	20	81
B.E.P.S (41)	18	31	23	22	94
B.E.H.S (22)	7	22	8	34	71
B.E.H.S (23)	15	16	23	24	78
Total	**137**	**128**	**152**	**142**	**559**

Instruments

This section describes each of the measures used in the current study. All primary students (N=559) from the participating schools (N=11) were asked to complete the Tests for Verbal Short-Term Memory and Reading Ability Tests. These survey instruments take about two hours to complete.

Primary students' verbal short-term memory was consists of four subscales: memory for sentences, memory for digits forward, memory for digits backward and memory for objects which are adapted from The Stanford-Binet Intelligence Scales: Fourth Edition (SB-IV) (cited in Anastasi,1997). Moreover, researcher made reading ability tests were constructed with two subjects, Myanmar and English, to measure the students' reading ability based on the Metropolitan Achievement Tests (1978) and the Neale Analysis of Reading Ability (1989).

A total of 50 items consists of 8 memory for sentences, 8 memory for digits forward, 8 memory for digits backward, 8 memory for objects, 8 Myanmar reading ability tests and 10 reading ability tests for English subjects, respectively. In scoring the tests, the students were provided 32 marks for the completion of 32 multiple choice items of students' verbal short-term memory tests and 10 marks for the completion of 10 items of English reading ability tests. The scoring method was 1 for correct answer and 0 for wrong (incorrect) answer. But the reading ability tests for Myanmar Subject scored 10 marks for 8 items. Because of the Myanmar reading ability tests assess the students reading comprehension ability.

Data Analysis of Results

1. The Verbal Short-Term Memory and Reading Ability of Students

The responses in tests exposed that the mean scores and standard deviations of primary students' verbal short-term memory were 24.27 and 5.82 and their reading ability were 15.22 and 5.75 (see Table 1).

Table 1: The Results of Students' Verbal Short-Term Memory and Reading Ability

Variables	N	Mean	Std. Deviation	Minimum	Maximum
Verbal Short-term Memory	559	24.27	5.820	5	32
Reading Ability	559	15.22	5.750	2	20

These results showed that primary students' verbal short-term memory and reading ability were satisfactory in the present study.

2. Comparison of Primary Students' Verbal Short-Term Memory and Reading Ability by Grade

To investigate the difference between Grade 3 and Grade 5 in verbal short-term memory and reading ability, descriptive analysis was conducted.

Table 2: Mean and Standard Deviation of Verbal Short-Term Memory and Reading Ability by Grade

Variable	Grade	N	Mean	Std. Deviation
Verbal Short-term Memory	Grade 3	265	20.75	5.349
	Grade 5	294	27.71	3.687
Reading Ability	Grade 3	265	11.62	5.127
	Grade 5	294	18.47	4.113

Table 3: The Result of the *t*-test on Primary Students' Verbal Short-Term Memory and Reading Ability by Grade

Variable	*t*	*df*	*p*	Mean Difference
Verbal Short -Term Memory	-18.856	557	.000	-7.269
Reading Ability	-17.518	557	.000	-6.858

According to the result of the t-test, there were significant difference between Grade 3 and Grade 5 students in their verbal short-term and the reading ability of Grade 3 students was significantly different from Grade 5 students.

3. ANOVA Results for Primary Students' Verbal Short-Term Memory and Reading Ability by School

In this present research, the participated students were from different types of schools such as monastic school, primary school and high school. Therefore, it is necessary to compare their verbal short-term memory and reading ability by school.

Table 4: ANOVA Results in Differences among Primary Students with Different Schools

Variables		Mean Squares	F	Sig.
Verbal Short-Term Memory	Between Group	671.110	21.250	.000
	Within Group	31.582		
Reading Ability	Between Group	848.758	28.169	.000
	Within Group	30.131		

Table 5: Post Hoc Analysis of Primary Students' Verbal Short-Term Memory and Reading Ability among Schools by Tukey Method

Dependent Variable	(I) Age	(J) Age	Mean Difference (I-J)	Std. Error	Sig.
Verbal Short-term Memory	Monastic	Primary	-2.089*	.567	.001
		High	-4.150*	.637	.000
	Primary	Monastic	2.089*	.567	.001
		High	-2.061*	.583	.001
	High	Monastic	4.150*	.637	.000
		Primary	2.061*	.583	.001
Reading Ability	Monastic	Primary	-3.151*	.554	.000
		High	-4.469*	.622	.000
	Primary	Monastic	3.151*	.554	.000
		High	-1.318*	.569	.055
	High	Monastic	4.469*	.622	.000
		Primary	1.318*	.569	.055

4. The Relationships between Primary Students' Verbal Short-Term Memory and Reading Ability

The Pearson Product-Moment Correlation Coefficient was used to find the correlation between verbal short-term memory and reading ability (see Table 6).

Table 6: The Relationships between Students' Verbal Short-Term Memory and Reading Ability for Each Subscale

Subscales	1	2	3	4	5	6
Memory for Sentences	1					
Memory for Digits Forward	.502**					
Memory for Digits Backward	.485**	.442**				
Memory for Objects	.580**	.372**	.398**			
Reading Ability (Myanmar)	.582**	.380**	.417**	.505**		
Reading Ability (English)	.506**	.295**	.373**	.384**	.475**	1

**Correlation is significant at the 0.01 level (2-tailed)

As shown in the above table, the four subscales of verbal short-term memory were strongly and significantly correlated with their reading ability in Myanmar and English.

However, correlations do not indicate prediction of one variable from another variable. So, stepwise regression analysis was conducted.

Table 7: Multiple Regression Analysis Predicting Students' Reading Ability (RA) from Memory for Sentences, Memory for Objects and Memory for Digits Backward

Model	Unstandardized Coefficients		Standardized Coefficients	*t*	Sig.
	B	Std. Error	Beta		
(Constant)	1.783	.663		2.691	.007
Memory for Sentences (MS)	1.208	.113	.434	10.721	.000
Memory for Objects (MO)	.612	.113	.209	5.425	.000
Memory for Digits backward (MDB)	.502	.108	.168	4.670	.000

a. Dependent Variable: Reading Ability

$$RA = 1.783 + 1.208\ MS + 0.612\ MO + 0.502\ MDB$$

This finding revealed that the primary students' reading ability was dependent on memory for sentences (MS), memory for objects (MO) and memory for digits backward (MDB) is shown in Figure 1.

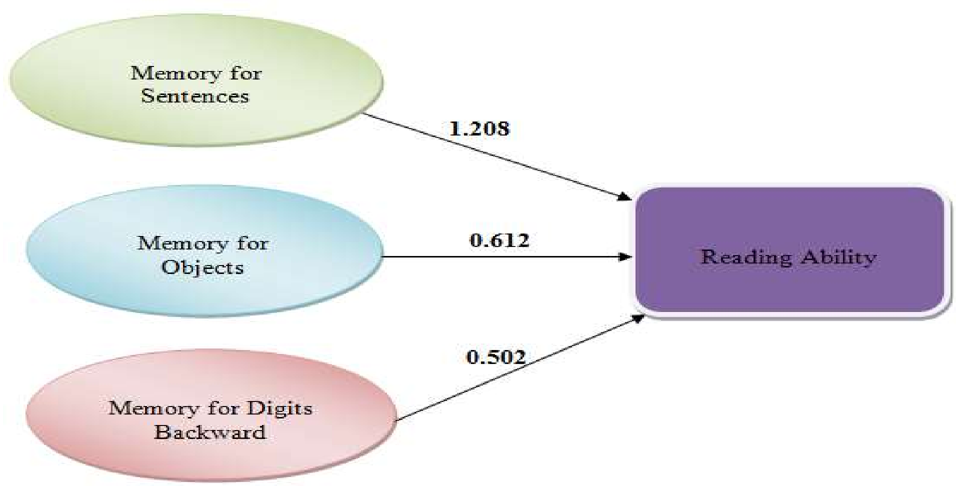

Figure 1: Model for Predicting the Effect of Verbal Short-Term Memory on Students' Reading Ability

Conclusion, Discussion and Suggestions

The primary students had high verbal short-term memory and they also had good reading ability. Then, Grade 5 students had higher verbal short-term memory than Grade 3 students and Grade 5 students had also higher reading ability in two subjects than Grade 3 students.

The primary students from high schools had the highest verbal short-term memory and reading ability when they compare with monastery and primary school students. That is why the differences of facilities, socio-economic status and geographic conditions.

Moreover, the primary students' verbal short-term memory was strongly correlated with their reading ability. This means that if primary students' verbal short-term memory was higher, their reading ability was higher. In addition, the students' verbal short-term memory was the good predictor for their reading ability.

Teachers should be actively supported students to improve their memory and to grow as readers. They should be encouraged to work together with students to adapt reading programs and they force students to read more. So that, children will become more develop their verbal short-term memory when they read more and more. And teachers should teach more practices and activities to improve students' memory such as memory games and puzzles. Then, teachers should encourage the students to read many books to get general knowledge and experience. Moreover, teachers should create many opportunities to get more knowledge and learning experience form school activities such as Essay Contests, Competitions of Poem, Art, Cartoons and Debates and so on.

It is also required to conduct the investigation of students' verbal short-term memory and reading ability depending upon their different ages, grades and schools. Moreover, the relationship between students' verbal short-term memory and other language skills, writing, listening and speaking ability should be investigated.

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Appendix A

Verbal Short-Term Memory Tests

<u>Memory Tests for Sentences</u>

1/ zwfjyoGm;aom pum;vkH;eSifhfudkufnDaom tajzudk a&G;cs,f yg/

1. This is a ------- of pine apple juice.

   (a) cup (b) tin (c) glass ………………

2. He ------- born in 2004.

   (a) is (b) was (c) has ………………

<u>Memory Tests for Digits forward</u>

2/ zwfjyoGm;aom udef;pOfrsm;eSifhfudkufnDaom tajzudk a&G;cs,f yg/

၁။ ၇-၉-၂

(က) ၇-၂-၉ (ခ) ၂-၉-၇ (ဂ) ၇-၉-၂ ………………

2/ ၅-၉-၄-၁

(က) ၅-၉-၁-၄ (ခ) ၅-၄-၁-၉ (ဂ) ၅-၉-၄-၁ ………………

<u>Memory Tests for Digits backward</u>

3/zwfjyoGm;aom udef;pOfrsm;eSifh ajymif;jyefjzpfaom tajzudk a&G;cs,f yg/

၁။ ၅-၄-၃

(က) ၅-၄-၃ (ခ) ၃-၄-၅ (ဂ) ၃-၅-၄ ………………

၂။ ၈-၇-၁

(က)၁ -၈ -၇ (ခ)၁ -၇ -၈ (ဂ)၈ -၇ -၁ ………………

Appendix B

Reading ability Test

ay;xm;aom pmydk'fudkaocsmpGmzwfyg/ pmydk'fatmuf&Sd 0gusrsm;twGuf ay;xm;aom tajzrsm;rStajzrSefudka&G;jyD; tajzrSefa&Sh&Sd tu©&mudk OyrmwGif jyxm;onfhtwkdif; jyD; ajzyg/

1. I am Khin Khin. My mother is Daw Aye. My father is U Mya. My mother is a teacher and my father is a farmer. I have two brothers and one sister. I am cooking with my mother and helping to my father.We are very happy at home.

Oyrm / I am -------.

A. Khin Khin B. Daw Aye C. U Mya

1. My ------- is Daw Aye.

   A. brother B. sister C. mother

2. My father is -------.

   A.U Myo B. U Myint C. U Mya

3. Daw Aye is a -------.

   A. nurse B. teacher C. doctor

4. I have ------- brothers.

   A. one B. two C. three

5. We are very happy at -------.

   A. school B. home C. zoo

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AN INVESTIGATION INTO THE FACTORS INFLUENCING RAPPORT ESTABLISHMENT ON GRADE 8 STUDENTS

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Abstract

The purpose of this study was to investigate the factors influencing rapport establishment between Grade 8 students and their teachers. Sample 1443 Grade 8 students from ten selected high schools participated in this study. Teacher-Student Rapport Inventory (QTI) was used. Based on the literature review, Teacher-Student Rapport Inventory was categorized and rapport establishment was considered to be influenced by the eight categories: (1) Disclosure, honesty and respect, (2) Recognizing the person/individual, (3) Interacting socially, (4) Caring and bonding, (5) Supporting and bonding, (6) Sharing, mirroring, mimicking, matching, (7) Availability, accessibility, and responsiveness, and (8) Communicating effectively. According to the exploratory factor analysis results, rapport establishment was influenced by the five factors or components: (1) Availability and care, (2) Social engagement, (3) Ability to reduce tension, (4) Understanding, and (5) Being friendly. There may be more benefits in conducting a longitudinal study using both qualitative and quantitative research methods.

Key Word: Rapport, Social Engagement, Understanding

Introduction

Everything is rapidly changing in the world especially in the educational system of Myanmar. Events are happening in a faster rate than before. No wonder, it is becoming extremely difficult for students to catch up the developing educational courses. At this time, many students are facing the problems in their school subjects and personal cases that are not able to be solved by themselves. This may arise a complete vacuum between students and changing educational system. In order to fill up this vacuum, teachers and students need to interact in a harmonious relationship. This concept, rapport means sympathetic relationship with the students by the teacher. Rapport exists only between people whenever a connection feels pleasant, engaged and smooth (Dave, Indu., 1983). Building rapport with students can be a

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remarkably effective way to improve classroom management. But there is some confusion over what rapport is and how one goes about building it. Rapport is nothing more than a connection a teacher makes with his students based on their positive feelings for him. When students like him and trust him, and when he in turn likes and believes in them, he will form a bond that makes classroom management a lot easier and student academic achievement improved. Students are more likely to engage in healthy behaviors and succeed academically when they feel the teacher's warmth, understanding and genuineness. Whitaker (2004) suggests that teachers are the first and perhaps most important point of contact in a student's life. Despite the countless reform, educational movements and programs implemented to improve education, no other element can be as profound as the human element. He urges, "It's the people, not the programs".

Purpose of the Study

The main purpose of the study was to investigate the factors influencing rapport establishment between Grade 8 students and their teachers.

Definition of Key Terms

Rapport: Rapport means a close and harmonious relationship in which the people or groups concerned understand each other's feelings or ideas and communicate well (Oxford Advanced Learner's Dictionary, 2017).

Review of Related Literature

If teaching is interactive, then it makes good sense to develop a positive quality in those relationships. But, what benefits might rapport yield that might not otherwise occur? The simplest answer is that rapport can yield trust between students and instructor. In the absence of basic trust, the instructor may not seem approachable (Brookfield, 1990). If we value deep learning, rapport and trust may help students engage in class more fully. At its core, good rapport can be viewed as an issue of job satisfaction: "Most college teachers enjoy classes more when they have good personal relationships with their students, and the satisfaction (in turn) has a beneficial effect on the quality of their instruction" (Brookfield, 1990).

Self-System theory emphasizes the importance of students' motivation and by doing so, explains the importance of teacher-student relationships. Students come to the classroom with three basic psychological needs — **competence**, **autonomy** and **relatedness** — all of which can be met in a classroom through students' interactions with teachers and with the learning environment (Deci & Ryan, 2002). Disorganization, unclear explanations, and/or a lack of clear and prompt feedback can damage students' respect for their teachers and, by extension, teachers' rapport with them (Brookfield, 1990).

To establish rapport, first of all, a teacher needs to care the students. Some principals in mainly minority schools have said that they have serious problems with too many kids dropping out, acting disrespectfully, and slipping through the system without learning. Researchers found evidence that schools with caring teachers were exactly what disadvantaged or at-risk students needed to help break downward spirals of failure (Comer, 1989; Hobbs et al., 1984; Meier, 1991; Schorr & Schorr, 1988; Wehlage, Rutter, Smith, Lesko, & Fernandez, 1989) (as cited in Miller, R. M., 2008). Educators broke the downward cycle by caring about each individual student.

Rapport means relation; especially: relation marked by harmony, conformity, accord, or affinity. All counseling theorists agree that an effective relationship or rapport is an absolute essential aspect of the counseling process (Cottone, 1992; Hutchins & Cole, 1986; Kottler & Brown, 1992; Nelson Jones, 1990; Nugent, 1990; Young, 1992; Brammer, 1988, cited in Muro, J.J., Kottman, T., 1995).

Student-teacher rapport may be related to students' attitudes in various content areas. For grade 12 students, "regardless of their ethnicity, adolescents seek out teachers who care about and support them, and view them as being good students" (Sanders and Jordan, 2000, p. 68) (cited in Brent, 2005). So not only can developing a personal bond with students benefit the teacher, but students feel a desire to work with that specific teacher; they want to learn with that teacher.

Benson, Cohen, and Buskist (2005) found that, in classes where teachers established rapport, students were more likely to attend class, pay attention, and enjoy the subject matter. Frisby and Martin (2010) found that instructor rapport emerged as a significant predictor of cognitive and affective learning. Granitz, Koernig, and Harich (2009) linked rapport with enhanced learning, attention, motivation, attendance, and involvement for students. They identified more rewarding teaching for faculty and higher evaluations. Not surprisingly, given these outcomes, the authors concluded that "one of the key traits of master teacher is the ability to foster student rapport".

Also, rapport is defined as an overall feeling between two people encompassing a mutual, trusting, and prosocial bond (Catt, Miller, & Schallenkamp, 2007). Although students report that rapport is an essential characteristic of a teacher, relatively little is known about this key facet of teaching (Frisby & Martin, 2010).

The rapport between instructor and student can be a significant factor in the overall learning and success of individual students. Rapport is one term that is truly relationship-centered in capturing what is experienced in an interpersonal relationship (Jorgenson, 1992) and Coupland (2003) argues that building rapport can have positive effects on the classroom environment. It can minimize anxiety, increase student participation, structure and encourage social interaction, foster a positive learning environment, and increase learning (Frisby & Martin, 2010).

Wasley states that students who interact frequently with an instructor earn higher grades, are more satisfied, and are more likely to return to school in subsequent years (Wasley, 2006).In spite of its importance, compared to other classroom variables, little is known about rapport and it remains a "relatively new variable to be considered in the educational setting" (Frisby & Martin, 2010, p.160). In addition, instructors may tend to focus more on information transmission than on establishing rapport (Benson et al., 2005).

While teaching journals and manuals have a surfeit of guidance on facilitating discussion, integrating technology, and obtaining student feedback, one area of emphasis that is surprisingly lacking is the development of rapport between teacher and student. This is because rapport is tricky to fully understand. Perhaps that is why the voluminous literature on college and university teaching essentially ignores it. Rapport has been avoided in favour of other, more important variables which can be more readily conceptualized and manipulated. Nonetheless, it is worth considering the role of rapport if for no other reason than its contributions to effective teaching (Buskist & Saville, 2001).

The study results of Brandi Frisby and Matthew Martin indicated that perceived rapport with instructors is positively related to classroom connectedness, participation, and overall student learning. Frisby and Martin found the instructor rapport enhanced almost all facets within the classroom (Frisby & Martin, 2010). The results support their hypothesis that perceived classroom rapport is positively correlated with an improved learning environment. These results bolster the argument that students enter a classroom with a need for instructors to like them and that instructor-student rapport is an ever-vital aspect of student success (Frisby & Martin, 2010).

Rapport is a dyadic phenomenon (Altman, 1990), experienced only in interaction between individuals, and not a personality trait (Tickle-Degnen & Rosenthal, 1990). It is therefore a mutual phenomenon characterized by mutual attentiveness (Tickle-Dengen & Rosenthal, 1990) mutual respect (Kyriacou, 2009), mutual openness (Granitz et al., 2009), mutual attention (Hall et al., 2009), and mutual understanding (Carey et al., 1986). The mutual attention, however, must be positive or harmonious in nature.

Tickle-Dengen and Rosenthal (1990) argue that rapport would not be present when the attentiveness is negative. Therefore, rapport involves harmonious understanding (Kyriacou, 2009), harmonious interactions (Bernieri, 1998), harmonious relations (Gremler & Gwinner, 2000; Spencer-Oatey, 2000).

Building positive student-teacher relationships can be done through various teaching strategies. White (1999) utilized a form of reflective journaling for students to develop their own educational philosophy. Not only did this immediately open the lines of communication between teacher and student, White reports that it helped the instructor emphasize the value and meaning of learning (White, 1999). Diero's (1997) study described six strategies that a teacher could use to build positive, nurturing relationships. These strategies were observed in the teachings of several teachers who were known for being able to build positive rapport with their students. Of the strategies, emphasis was placed on keeping high expectations for students. Also beside high expectations was a description of using appropriate self-disclosure, networking with family and friends, building a sense of community in the classroom, and using rituals and traditions (Diero, 1997). Yet another study by Baker (1999) found that students who reported high satisfaction from school tended to receive more negative feedback from a teacher when being given assistance. This is indicative again of using a form of higher expectation for the students you know are capable of reaching it. These strategies can have a positive impact on a teacher's classroom environment, and can help them avoid the effects of student feeling negative rapport.

Diero (1997) states "People like people who think highly of them. Students like teachers who think highly of them". This simple point effectively summarizes why an environment of positive rapport is beneficial to the classroom. Teachers in Kentucky and Russia believed students were more motivated when relationships were free of hostility and when the student believed the teacher liked them and the student liked the teacher. Just showing the students that they are liked and appreciated can change their attitudes about a class. Student-teacher rapport may be related to students' attitudes in various content areas.

In a more recent study, Sanders and Jordan (2000) found positive teacher-student rapport may have improved student school behavior, increased classroom preparation, and reduced student engagement in maladaptive behaviors. Similarly, Ryan and Patrick (2001) noticed that "students' perceptions of teacher support, and the teacher as promoting interaction and mutual respect were related to positive changes in their motivation and engagement". Alongside this, their data also showed that "teacher support, promoting interaction, and promoting mutual respect were related positively to social efficacy with teachers and peers, academic efficacy, and self-regulated learning, and related negatively to disruptive behavior". Thus the effects building positive rapport with students can give many advantages to the teacher when dealing with student behavior, motivation, academic efficacy, and multiple (if not infinite) other variables.

The study done by Soe Yu Hlaing (2011) found that teachers assumed parental involvement, mutual understanding between teachers and students, perseverance and self-practice of students, educational system and teachers' proficiency and quality were important factors that could impact on the academic achievement of students. Most teachers replied they self-evaluated on their advices that they gave to their students whether right or wrong. It was obvious that majority of teachers wanted to give better suggestions and they showed their good deed on students. Student survey questionnaire showed students pay respect, appreciate, believe and love the teachers of good proficiency. Students answered that they wanted to change their mistakes when they were encouraged than they were blamed (Soe Yu Hlaing, 2011).

Case-study results showed student A loved the teacher of peaceful-minded and skillful in teaching subjects. He thought that the teacher should have well-experienced, proficiency and ability to understand students' mind to be appreciated by the students. Student B likes the teacher who well-understands students' problems, who listens to the students' opinions, who speaks lovely and who deals with students with empathetic mind. She felt upset when she was taught by a teacher of scolding without any important reason. She disliked biased teacher (Soe Yu Hlaing, 2011).

Method

Design of this study is cross sectional in nature and descriptive survey method.

Participants of the Study

There are altogether fourteen States and Regions in Myanmar. Therefore, one state and one region from upper Myanmar and one state and two regions from lower Myanmar which is 30% of Myanmar were chosen as a sample population. There are two types of government schools for which Grade 8 students are able to attend: Basic Education High School and Basic Education High School (branch). From each city, one Basic Education High School and one Basic Education High School (branch) will be selected.Participants of this study were Grade 8 students from selected regions in the academic year of 2016-2017. In this study, 266(18.43%) participants were from Shan State, 300(20.79%) participants were from Mandalay Region, 300(20.79%) participants were fromMon State, 300(20.79%) participants were from Bago Region and 277(19.2%) participants were from Yangon Region. Female comprised 52.11% and the rest were males.

Instruments

Based on the literature, there are eight factors that influence rapport establishment. These are (1) Disclosure, honesty and respect, (2) Recognizing the person/ individual, (3) Interacting socially, (4) Caring and bonding, (5) Supporting and bonding, (6) Sharing, mirroring, mimicking, matching, (7) Availability, accessibility, and responsiveness, and (8) Communicating effectively. In the following table, the indicators of rapport as articulated in the literature are synthesized and categorized.

Disclosure, honesty and respect	***Supporting and monitoring***
-Being open, honest and transparent -Showing students one's human side -Admitting faults and mistakes -Talking freely -Engaging in self-disclosure -Thanking, apologizing -Sharing personal information -Creating trust through fulfillment of contracts and promises -Not psychologically threatening students by talking down to them -Showing consistent and predictable behaviours	-Showing care for and monitoring students' progress -Tailoring learning to students' needs -Providing guidance, feedback, support, help -Giving praise for good work -Giving help patiently and constructively -Dealing with lack of progress in a concerned manner -Showing patience with students. -Exerting and expecting effort from students -Listening and paying attention -Showing interest in student success -Helping and encouraging them to succeed -Creating a positive, friendly, cooperative environment

Recognizing the person/individual	***Sharing, mirroring, mimicking, matching***
-Understanding the student as a person -Recognizing differences -Avoiding favouritism -Reporting on or requesting personal information, ideas, opinions and emotions -Engaging in personal discussions -Keeping track of students' photos and information related to their preferences and extra-curricular activities -Making personal contacts	-Being "on the same wave length" -Adopting each other's perspective -Writing a response in same style -Matching body language, gestures, voice tempo and volume -Smiling and head nodding -Sharing values, attitudes, social style, beliefs

Interacting socially	***Availability, accessibility, and responsiveness***
- Engaging in social conversation - Engaging in non-course related, off-task chat - Getting to know students socially - Using humour	- Being available to answer questions, - Being accessible - Being responsive - Providing constant and immediate feedback

Caring and bonding	***Communicating effectively***
- Being caring - Bonding - Showing concern - Showing empathy and understanding of students' needs	- Ensuring that communication is comfortable, easy/smooth - Using technologies such as instant messaging with which students are comfortable

Based on the literature, there were 48 items in the Teacher-Student Rapport Inventory (QTI).There were four possible responses to each question (4-point Likert scale) to indicate agreement ranging from responses of "Never" (1), "Almost Never" (2), "Almost Always" (3), and "Always" (4).

Data Collection Procedure

Data were gathered from 15 November 2016 to 15 December 2016. In each school of the first day, Teacher-Student Rapport Inventory was given to the grade 8 students and explained about the questions by the researcher. Then, students were asked to circle the number which is the most appropriate answer they feel in the Likert scale. According to the above procedures, the collection of the required data was conducted in each selected school by survey procedure.

Findings

In this study, factors influencing rapport establishment on Grade 8 students were investigated among the selected schools from Shan State, Mandalay Region, Mon State, Bago Region and Yangon Region. With the aim to answer the research question, facts influencing rapport establishment were firstly collected based on the literature. Then these facts were analyzed by using exploratory factor analysis.

At first, the critical value for which the *Mahalanobis Distance* must be greater than must be known to delete if a variable is a multivariate outlier. So, the *Mahalanobis Distance* was also computed (see Table 1).

Table 1: Extreme Values

Extreme Values

			Case Number	Value
Mahalanobis Distance	Highest	1	419	176.05236
		2	1057	174.57600
		3	738	174.08184
		4	1330	171.93253
		5	569	171.05027
	Lowest	1	1166	3.69460
		2	1165	3.69460
		3	1164	3.69460
		4	1163	3.69460
		5	1162	3.69460[a]

a. Only a partial list of cases with the value 3.69460 are shown in the table of lower extremes.

According to Mahalanobis Distance, there is no outlier that exceeds the critical value. Then scree plot was used to determine the number of significant factors.

Table 2: Communalities

	Initial	**Extraction**
Openness	1.000	.493
Favouritism	1.000	.440
Humour	1.000	.511
Bonding	1.000	.447
Showing one's human side	1.000	.419
Exerting and expecting effort	1.000	.559
Same wavelength	1.000	.555
Constant and immediate feedback	1.000	.457
Using technologies	1.000	.501
Admitting faults and mistakes	1.000	.546
Understand as a person	1.000	.467
Personal contacts	1.000	.538
Social conversation	1.000	.496

	Initial	**Extraction**
Caring	1.000	.631
Talking freely	1.000	.494
Tailoring students' needs	1.000	.500
Listening and paying attention	1.000	.467
Body language, gestures, voice, tempo, volume	1.000	.341
Availability to answer questions	1.000	.455
Self-disclosure	1.000	.471
Recognizing differences	1.000	.403
Non-course related, off task chat	1.000	.480
Showing concern	1.000	.550
Care for and monitoring progress	1.000	.601
Patience	1.000	.546
Response in same style	1.000	.379
Creating positive, friendly, cooperative environment	1.000	.483
Being accessibility	1.000	.449
Thanking and apologizing	1.000	.421
Reporting/requesting personal information	1.000	.514
Know student socially	1.000	.487
Guidance, feedback, support, help	1.000	.533
Interest in student success	1.000	.494
Smiling and head nodding	1.000	.510
Being responsive	1.000	.483
Help to succeed	1.000	.586
Sharing personal information	1.000	.511
Keeping track	1.000	.537
Empathy	1.000	.602
Building trust	1.000	.462
Personal discussions	1.000	.530
Praise	1.000	.458
Sharing values, attitudes, social style and beliefs	1.000	.523
Help patiently and constructively	1.000	.590
Comfort communication	1.000	.601

	Initial	Extraction
Not psychologically threatening	1.000	.504
Dealing with lack of progress	1.000	.534
Consistent and predictable behaviours	1.000	.414

Communalities range from 0 to 1 where 0 means that the factors don't explain any of the variance and 1 means that all of the variance is explained by the factors. Variables with small extraction communalities cannot be predicted by the factors and it should be considered eliminating them if too small (<.20). In the current result, there is no communality that is not less than .20. Therefore, no variable have to be removed.

Table 3: Total Variance Explained

Compo -nent	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumula -tive %	Total	% of Variance	Cumula -tive %	Total	% of Variance	Cumula -tive%
1	18.040	37.583	37.583	18.040	37.583	37.583	6.357	13.243	13.243
2	2.392	4.984	42.568	2.392	4.984	42.568	5.481	11.419	24.662
3	1.345	2.802	45.369	1.345	2.802	45.369	5.340	11.125	35.786
4	1.175	2.447	47.816	1.175	2.447	47.816	4.529	9.436	45.222
5	1.020	2.125	49.941	1.020	2.125	49.941	2.265	4,719	49.941
6	.958	1.996	51.937						
7	.943	1.965	53.902						
8	.896	1.866	55.768						

The extraction Sums of Squared Loadings is identical to the Initial Eigenvalues except factors that have eigenvalues less than 1 are not shown. These columns show the eigenvalues and variance prior to rotation. The *Rotation Sums of Squared Loadings* show the eigenvalues and variance after rotation. According to the rotated eigenvalues, there are five components. Then, the scree plot was tested.

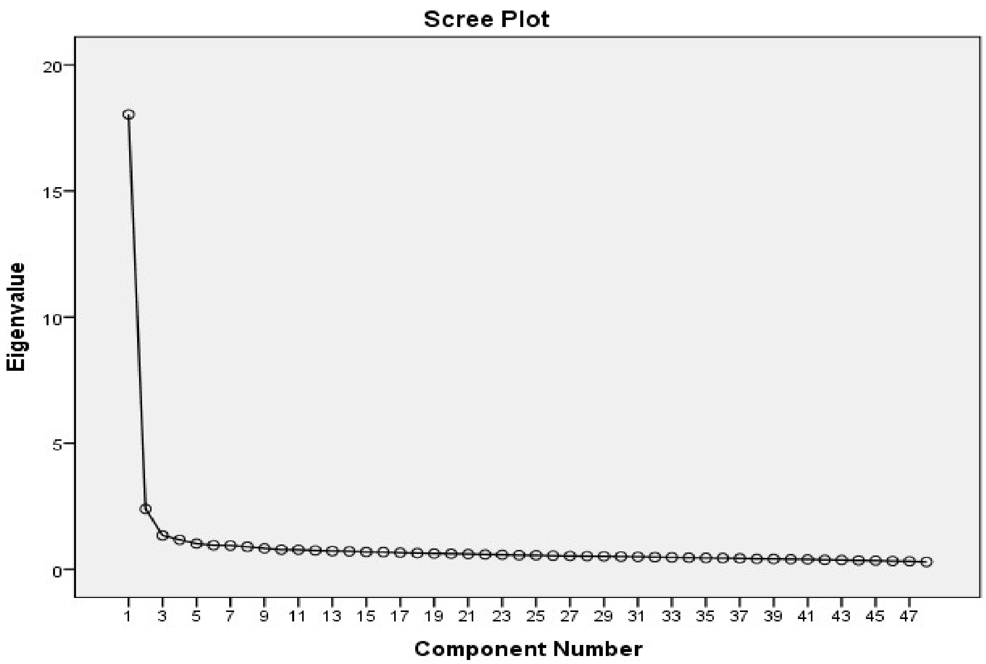

Figure 1: Scree plot indicating that the data have five factors

The scree plot was assessed and indicates that the eigenvalues after five components levels off. Next, it is needed to check if the model is a good fit by looking at the summary of the percentage of the non-redundant residuals at the *Reproduced Correlation matrix*. A model that is a good fit will have less than 50% of the non-redundant residuals with absolute values that are greater than .05 which is true for the current dataset. Residuals are computed between observed and reproduced correlation. There are 141 (12.0%) non-redundant residuals with absolute value greater than 0.05 (the table is not shown here because of its big size).

The factor loadings show that factors are fairly desirable with at least 3 variables per factors that are above .32. The resultant factor loadings are shown clearly in the Table 4.

Table 4 : Factor Loadings

	Component				
	1	**2**	**3**	**4**	**5**
Exerting and expecting effort	.671				
Help to succeed	.665				
Care for and monitoring progress	.629				
Showing concern	.609				
Caring	.586				
Guidance, feedback, support, help	.576				
Interest in student success	.569				
Recognizing differences	.526				
Dealing with lack of progress	.524				
Tailoring students' needs	.457				
Praise	.445				
Being responsive	.441				
Availability to answer questions	.399				
Consistent and predictable behaviours	.387				
Personal contacts		.654			
Keeping track		.639			
Non-course related, off-task chat		.637			
Social conversation		.614			
Using technologies		.583			
Personal discussions		.573			
Reporting/requesting personal information		.570			
Sharing personal information		.568			
Response in same style		.458			
Body language, gestures, voice, tempo, volume		.330			
Comfort communication			.629		
Not psychologically threatening			.614		
Empathy			.598		
Help patiently and constructively			.584		
Building trust			.496		
Sharing values, attitudes, same style and beliefs			.484		
Patience			.456		
Know student socially			.429		
Creating positive, friendly, cooperative			.398		

	Component				
	1	**2**	**3**	**4**	**5**
environment					
Thanking and apologizing			.383		
Admitting faults and mistakes				.573	
Openness				.562	
Same wavelength				.522	
Favouritism				.489	
Showing one's human side				.477	
Understand as a person				.467	
Constant and immediate feedback				.461	
Talking freely				.441	
Bonding				.438	
Self-disclosure				.418	
Listening and paying attention				.369	
Humour					.553
Being accessibility					.540
Smiling and head nodding					.524

Naming the Factors

Naming of factors is more of an 'art' as there are no rules for naming factors, except to give names that best represent the variables within the factors. There are five factors according to the EFA result namely availability and care, social engagement, ability to reduce tension, understanding and being friendly.

Component 1 (*Availability and Care)*

1. Exerting and expecting effort
2. Help to succeed
3. Care for and monitoring progress
4. Showing concern
5. Caring
6. Guidance, feedback, support, help
7. Interest in student success
8. Recognizing differences

9. Dealing with lack of progress
10. Tailoring students' needs
11. Praise
12. Being responsive
13. Availability to answer questions
14. Consistent and predictable behaviours

Component 2 (*Social engagement)*

1. Personal contacts
2. Keeping truck
3. Non-course related, off-task chat
4. Social conversation
5. Using technologies
6. Personal discussions
7. Reporting/requesting personal information
8. Sharing personal information
9. Response in same style
10. Body language, gestures, voice, tempo, volume

Component 3 (*Ability to reduce tension)*

1.Comfort communication

2.Not psychologically threatening

3. Empathy
4. Help patiently and constructively
5. Building trust
6. Sharing values, attitudes, same style and beliefs
7. Patience

8. Know student socially
9. Creating positive, friendly, cooperative environment
10. Thanking and apologizing

Component 4 (*Understanding)*

1. Admitting faults and mistakes
2. Openness
3. Same wavelength
4. Favouritism
5. Showing one’s human side
6. Understand as a person
7. Constant and immediate feedback
8. Talking freely
9. Bonding
10. Self-disclosure
11. Listening and paying attention

Component 5 (*Being friendly)*

1. Humour
2. Being accessibility
3. Smiling and head nodding

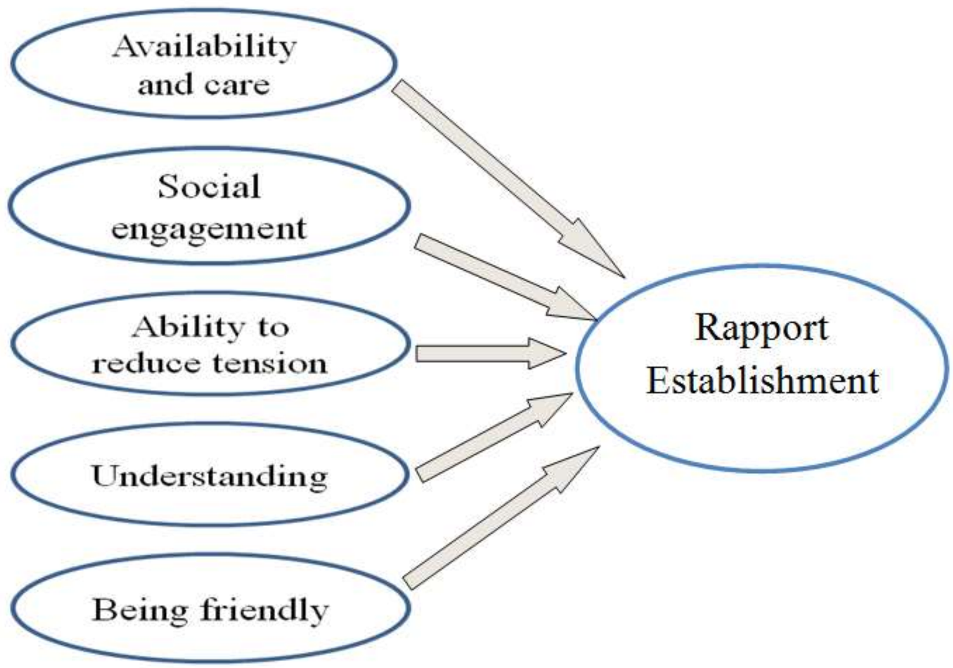

Figure 2: Factors influencing on rapport establishment

In summary, improving students' relationships with teachers has important, positive and long-lasting implications for both students' academic and social development. Solely improving students' relationships with their teachers will not produce gains in achievement. However, those students who have close, positive and supportive relationships with their teachers will attain higher levels of achievement than those students with more conflict in their relationships.

Conclusion

In this study it was observed that there are all together five factors that influence rapport establishment. Researchers Murdock and Miller (2003) stated that students' assessments of the quality of their relationships with their teachers are an important predictor of their commitment to schooling. These relationships exist because students internalize the values and standards of their teachers when the relationship is characterized by mutual respect and admiration (Battistich, Solomon, Watson, & Schaps, 1997; Cormell &

Wellborn, 1991). According to Deiro (1996), teachers require principles and practical skills for building close and trusting relationships.

According to Deiro (1996), a teacher-student relationship focuses on nurturing behavior and support to build close and trusting connections. In order to develop close and trusting relationships with students, teachers need to convey caring for students and openness to emotional connections. It is important for teachers to reach out and make connections with students, because this is what connects students to learning and their world (Darling-Harnmond, 1998; Lieberman, 1996). Teachers need to reflect on and experiment with how to establish relationships of care and trust with their students and get to know their students better without intruding into their private lives and violating their dignity (Noddings, 1996).

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TEACHING STYLES AND PERSONALITY TYPES OF TEACHERS

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Abstract

The purpose of this study was to investigate teaching styles and personality types of teachers. Quantitative and descriptive approaches were used in this study. To collect the required data, Teaching Style Inventory and Psychological Type Index (Grasha, 1996) were used as research instruments. In former measure, five subscales (expert, formal authority, personal model, facilitator and delegator) were included. The later included eight subscales (extrovert, introvert, sensing, intuition, thinking, feeling, judging and perceiving). The required data were collected during December 2016. Participants were 500 teachers from Yangon and Tanintharyi Regions. As the most predominant teaching style and psychological type in this study were 'Expert' style and 'Judging' type, participants tended to possess certain knowledge and skills that students need and like order and organization. Independent sample t-test revealed that teachers in Yangon Region were higher in expert and delegator styles and introvert, sensing and feeling types than teachers in Tanintharyi Region. Moreover, rural schools' teachers were better in facilitator style and urban schools' teachers were good in introvert, sensing and feeling types. ANOVA results showed that 31-40 aged teachers were better in facilitator style and 51-above aged teachers were higher in perceiving type. There was no significant difference in teaching styles by service whereas significant differences exist in personality types. Pearson correlation revealed that personality types were correlated with teachers' teaching styles. Results from the regression analysis indicated that extrovert, introvert, intuition, feeling and thinking personality types were significant predictors for teacher-centerd teaching styles (expert, formal authority and personal model) and extrovert, intuition, thinking, feeling, judging and perceiving personality types for student-centered teaching styles (facilitator and delegator). So teachers who use the best teaching styles that suit their personality types will make their teaching more successful because effective teaching depends on the selection of teaching styles.

Key Words: Teaching Style, Personality, Personality Type

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Introduction

Every instructor has a distinctive style of teaching. Through their styles, teachers integrate the theories or pedagogy in which they believe and the practices they adopt in the classroom. Teaching and learning process is a pedagogical act that involves both teachers and students. Both teachers and students are unique individuals who possess their own way of learning and teaching. When teachers and students understand the differences in their teaching and learning styles, learning is enhanced. Teaching styles, as Brown (2007) stated, refer to the enduring preferences within an individual and they vary with each one; therefore, the style a teacher possesses is an essential aspect to be better understand the teaching and learning process. In fact, several studies on the field of teaching styles point out that more research has to be done to really unravel the impact and the consequences of a determined teaching style on students and their learning (Eggen & Kauchak, 1996; Lightbown & Spada, 1999; Macaro, 2003).

Personality may be viewed as the dynamic organization of those traits and characteristic patterns of behavior that are unique to the individual (Callahan, 1966). Becoming aware of one's own personality type and the personality type of others can be helpful in mounting intra-personal and inter-personal development. The key to the satisfied, successful and effective occupational and professional life is to have those personality traits most suited to one's profession, job or occupation. Specifically, teaching as novel and innovative profession demands certain personality traits to be essential for efficacy and quality performance. Knowledge of personality type and awareness of how personality type relates to teaching style will help teachers become more successful and confident in their teaching profession.

Purpose of the Study

The purpose of the study is to investigate teaching styles and personality types of teachers.

Definitions of the Key Terms

Teaching Style: Teaching style refers to a teacher's personal behaviours and media used to transmit data to or receive it from the learners and involve the implementation of the teacher's philosophy about teaching (Brown, 2001).

Personality: Personality is the more or less stable and enduring organization of a person's character, temperament, intellect and physique, which determine his unique adjustment to the environment (Eysenck, 1971).

Personality Type: A person's characteristic pattern of major personality dimensions (introversion-extraversion, thinking-feeling, and sensation-intuition) **(**Jung, 1971).

Review of Related Literature

Individuals have the basic capability to learn and to teach; however, they are not able to learn and teach effectively in the same exact way (Gregorc, 1979). Dunn and Dunn (1979) cited that not only do students learn in considerably different ways, but certain students succeed only through selected teaching methods. Teaching methods and style stem from a specific philosophy of education, even if the teacher isn't aware of what that philosophy is. A teacher's teaching style reflects on what he values in education, what methods he believes are effective and how his students learn his subject best.

According to Grasha (1996), teaching style is viewed as a particular pattern of needs, beliefs, and behaviours that teachers display in the classroom. He also states that style is multidimensional and affect how teachers present information, interact with students, manage classroom tasks, supervise coursework, socialize students to the field, and mentor students.

Through his research, Anthony Grasha (1996) identified five potential approaches for classroom teachers:

- Expert (transmitter of information)
- Formal Authority (sets standards and defines acceptable ways of doing things)
- Personal Model (teaches by illustration and direct example)
- Facilitator (guides and directs by asking questions, exploring options, suggesting alternatives)
- Delegator (develops students ability to function autonomously)

Developing an effective teaching style for subject area requires time, effort, a willingness to experiment with different teaching strategies and an examination of what is effective in teaching. A teacher's teaching style is based on their educational philosophy, their classrooms demographic, what subject area they teach, and the school's mission statement. It is important to know that there are two key approaches that the other teaching theories fall into: teacher-centered and student-centered.

Since ancient times various systems of typology have been developed to explain why individuals approach to the same subject differently. One of the influential typology was Personality Type Theory developed by Jung (1921). Personality Type presents a pattern which indicates how people see the world, how information is collected and interpreted, how decisions are made, and how individuals live out lifestyle choices. Durham and Fowler (2009) expressed that while the employment of other typologies was not widespread used, modern typology attracts attention of various disciplines such as education, counseling and psychotherapy, organizational teamwork and communication, career counseling, and multicultural settings.

Based on this typology Myers and his daughter Briggs built an instrument to present behavioral preferences of individuals, called Myers-Briggs Type Indicator (MBTI). It identifies the personality preferences of an individual along four dichotomous out of which sixteen different personality types are drawn. In the last decades there has been a tremendous wave of interest to apply MBTI to find the relationship between personality type and one's success in a job, in management of time, in marriage, in child rearing, and in other contexts (Brown, 2000).

Table 1: Characteristics of Psychological Preferences

Preference	**Characteristics**	**Additional Characteristics**
Extraversion	Energized by being with people, interacting with others.	Does not mean talkative; and E can be quiet, even shy.
Introversion	Gains energy by being alone; down time generally means 'alone time'.	Introverts can be talkative and good in groups, but they need 'alone time' to recharge.
Sensing	Gather information through their five senses, detail-oriented; don't like theories as much as facts.	Like lists, clear directions, time tables. Often very literal, miss nuance, have difficulty generalizing.
Intuition	Use intuition and hunches; analytical and theoretical; see the 'big picture' and not as interested in the details.	Like to create their own plan after they understand a situation; bored by routine; comfortable with some uncertainty.
Feeling	Feelings matter, are important; like win-win solutions; generous with praise and affirmations.	Sometimes make less than ideal choices in order to please everyone; often hurt when not appreciated; can be quite sensitive to others.
Thinking	Practical, direct, expedient, logic rather than emotion.	Other people's feelings may be an afterthought; may seem insensitive.
Judging	Orderly, organized, predictable.	Feel best when work is done, things are as they should be.
Perceiving	Flexible, open-ended, somewhat spontaneous.	Fairly independent, make decisions based on mood, timing what feels right to them.

Díaz Larenas, Rodríguez Moran and Poblete Rivera (2011) investigated the title of "Comparing Teaching Styles and Personality Types of EFL Instructors in the Public and Private Sectors". Ramin Akbari, Akbar

Mirhassani and Hossein Bahri (2010) investigated the relationship between teaching styles and personality types of Iranian EFl teachers. Behnam and Bayazidi (2013) attempted to investigate the relationship between personality type of teachers and teaching styles in TEFL Iranian adult context.

Methodology

This study examined teaching styles and personality types of teachers from Yangon Region and Tanintharyi Region. In this study, descriptive survey method was used.

Sample

A total of 500 teachers were selected from 26 schools in Yangon Region and Tanintharyi Region.

Instrumentation

In this study, two instruments were used for data collection. Both instruments, teaching style inventory and personality type index, were developed by Grasha (1996). Teaching style inventory was constructed with total 40 items consisting five subscales of expert (8 items), formal authority (8 items), personal model (8 items), facilitator (8 items) and delegator (8 items).Personality types inventory included 136 items that represented eight subscales, extrovert E (7 items), introvert I (7 items), sensing S (7 items), intuition N (7 items), thinking T (7 items), feeling F (7 items), judging J (7 items) and perceiving P (7 items). The response type for each item of both instruments is a five point likert scale: 'strongly disagree' (1), 'moderately disagree' (2), 'undecided' (3), 'moderately agree' (4) and 'strongly agree' (5).The Cronbach alpha reliability of the teaching style inventory was 0.837. The Cronbach alpha reliability of the personality type inventory was 0.882.

Procedure

The required data were collected from 10 schools of Yangon Region and 16 schools of Tanintharyi Region during December 2016. Respondents used 5 point Likert scale to rate each statement in both questionnaires.

Data Analysis and Findings

To investigate the teachers' teaching styles, descriptive statistics were carried out by using descriptive procedure with the data obtained and the results are shown in table 2.

Table 2: Descriptive Statistics for Subscales of Teachers' Teaching Styles

Variables	Mean	Mean%	SD	Min	Max
Expert	31.56	78.9%	3.281	15	40
Formal Authority	29.63	74.07%	3.281	17	40
Personal Model	30.68	76.7%	2.886	21	40
Facilitator	29.95	74.87%	3.259	19	40
Delegator	28.62	71.55%	3.745	11	40

By studying table 2, it was found that the mean percentages of the participants were the highest in expert teaching style and the lowest in delegator teaching styles. It may be interpreted that the teachers from selected schools teach their students by displaying detailed knowledge and by challenging students to enhance their competence but are weak in teaching students to develop students' capacities to function autonomously. It may be because of inequality of teacher-student ratio, the hugeness of the class-size and inadequacy of teaching materials.

In order to find out whether there were significant differences in teaching styles by region, descriptive statistics was applied.

Table 3: Descriptive Statistics for Teachers' Teaching Styles by Region

Variables	Region	N	Mean	Mean %	Std. Deviation
Expert	Yangon	250	32.04	80.1%	3.117
	Tanintharyi	250	31.08	77.7%	3.377
Formal Authority	Yangon	250	29.82	74.55%	2.81
	Tanintharyi	250	29.44	73.6%	3.689
Personal Model	Yangon	250	30.9	77.25%	2.848
	Tanintharyi	250	30.46	76.15%	2.914
Facilitator	Yangon	250	30.12	75.3%	2.85
	Tanintharyi	250	29.78	74.45%	3.62
Delegator	Yangon	250	29.1	72.75%	3.232
	Tanintharyi	250	28.14	70.35%	4.148

Again, the independent sample *t*-test was used to examine whether the difference was significant or not.

Table 4: The Result of Independent Sample*t*-test for Teaching Styles by Region

Variables	***t***	**df**	**Sig. (2-tailed)**	**Mean Difference**
Expert	**3.276****	498	**0.001**	0.952
Delegator	**2.887****	498	**0.004**	0.96

According to table 4, the result of independent sample t-test confirmed that teachers in Yangon Region were higher than those in Tanintharyi Region on expert and delegator teaching styles. So it can be concluded that teachers in Yangon Region have certain knowledge and skills that students required and encourage students to develop their capacities to function autonomously. Because they can study their subject matter to be more proficient as Yangon City has many courses and a variety of books than other townships. ANOVA was computed to find out whether there were significant differences in teaching styles by age.

Table 5: ANOVA Result for Teaching Styles by Age

Variables		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Facilitator	Between Groups	89.203	3	29.734	**2.831***	**0.038**
	Within Groups	5209.645	496	10.503		
	Total	5298.848	499			

It can be observed that there was significant difference in facilitator teaching style. And then, it was computed post-hoc comparison using Tukey HSD test to find out the difference which age is higher than that of others.

Table 6: Results of Tukey HSD Multiple Comparison for Teaching Styles by Age

Variable	(I) Age	(J) Age	Mean Difference (I-J)	Sig.
Facilitator	31-40	51- above	**1.036***	**0.024**

It was evidently found that teachers whose age ranged between 31 and 40 were significantly likely to apply facilitator as their teaching styles. 31-40 aged teachers may be competent in teaching subject matter, establishing rapport with students and enthusiastic in teaching profession. They have much energy to perform educational programs effectively than 51-above aged teachers. It is not said that 51-aboved aged teachers are not good. Nevertheless, 51-above aged teachers were old-aged teachers and so most of them cannot attempt to be effective in teaching as 31-40 aged teachers.

ANOVA was computed to find out differences in teaching styles by service.

Table 7: ANOVA Results for Teaching Styles by Service

Variables		Sum of Squares	df	Mean Square	F	Sig.
Expert	Between Groups	31.987	3	10.662	0.991	0.397
	Within Groups	5339.213	496	10.765		
	Total	5371.2	499			
Formal Authority	Between Groups	62.676	3	20.892	1.952	0.12
	Within Groups	5307.874	496	10.701		
	Total	5370.55	499			
Personal Model	Between Groups	23.621	3	7.874	0.945	0.419
	Within Groups	4133.537	496	8.334		
	Total	4157.158	499			
Facilitator	Between Groups	80.73	3	26.91	2.558	0.054
	Within Groups	5218.118	496	10.52		
	Total	5298.848	499			
Delegator	Between Groups	54.156	3	18.052	1.289	0.277
	Within Groups	6945.644	496	14.003		
	Total	6999.8	499			

There was no significant difference in teaching styles of teachers by services. So it can be concluded that teaching style is not concerned with the teaching experiences.

ANOVA was computed to find out whether there were significant differences in teaching styles by township.

Table 8: ANOVA Results for Teaching Styles by Township

Variables		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Expert	Between Groups	208.574	3	69.525	**6.68*****	**0.000**
	Within Groups	5162.626	496	10.409		
	Total	5371.2	499			
Delegator	Between Groups	277.464	3	92.488	**6.824*****	**0.000**
	Within Groups	6722.336	496	13.553		
	Total	6999.8	499			

And then, it was computed post-hoc comparison using Tukey HSD test to find out the difference which age is higher than that of others.

Table 9: Results of Tukey HSD Multiple Comparison for Teaching Styles by Township

Variable	**(I) Town**	**(J) Town**	**Mean Difference (I-J)**	**Sig.**
Expert	Thayetchaung	Hlaing	**-1.898*****	**0.000**
Facilitator	Hlaing	Dawei	**1.225***	**0.039**
Delegator	Insein	Hlaing	**-1.418***	**0.017**
	Dawei	Hlaing	**-2.331*****	**0.000**
	Thayetchaung	Hlaing	**-1.482***	**0.013**

It was evidently found that Haling township was significantly different in expert, delegator and facilitator teaching styles than other townships.

The independent sample *t*-test was used to examine whether the difference was significant or not.

Table 10: The Result of Independent Sample*t*-test for Teaching Styles by School

Variables	***t***	**df**	**Sig. (2-tailed)**	**Mean Difference**
Facilitator	**-3.075***	498	**0.002**	-1.029

According to table 10, it can be interpreted that teachers in rural schools are higher than teachers in urban school in facilitator teaching style. Again, the independent sample *t*-test was used to examine whether the regional difference was significant or not.

Table 11: The Result of Independent Sampl e*t*-test for Personality Types by Region

Variables	***t***	***df***	**Sig.** ***(2-tailed)***	**Mean Difference**
Introvert	4.615***	498	0.000	2.324
Sensing	3.267***	498	0.001	1.812
Feeling	2.905**	498	0.004	1.624

According to table 11, the result of independent sample t-test confirmed that teachers in Yangon Region were higher than those in Tanintharyi Region in introvert, sensing and feeling personality types. So, they tended to considerate others' feelings and emotion in decision making though they emphasized facts and practical information. ANOVA was computed to find out whether there were significant differences in personality types by age.

Table 12: ANOVA Results for Personality Types by Age

Variable		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Perceiving	Between Groups	251.727	3	83.909	**3.078***	.027
	Within Groups	13523.223	496	27.265		
	Total	13774.950	499			

And then, it was computed post-hoc comparison using Tukey HSD test to find out the difference which age is higher than that of others.

Table 13: Result of Tukey HSD Multiple Comparisons of Personality Types by Age

Variable	**(I) age**	**(J) age**	**Mean Difference (I-J)**	**Sig.**
Perceiving	20-30	51- above	**-3.807***	**0.032**

According to table 13, the personality type of 51 and above aged teachers was significantly different from that of 20-30 aged teachers in perceiving personality types. So it can be found that 51 and above teachers are more unplanned and spontaneous in their lifestyle, including making decision than 20-30 aged teachers.ANOVA was conducted to examine the difference between services.

Table 14 : ANOVA Result for Personality Types by Service

Variables		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Judging	Between Groups	197.252	3	65.751	**3.164***	**0.024**
	Within Groups	10308.23	496	20.783		
	Total	10505.48	499			

*The mean difference is significant at 0.05 level.

Based on the result of ANOVA, personality types of teachers can be observed that there was significant difference in judging personality type at 0.05 level.To explore the relationship of teaching styles and personality types, Pearson product-moment correlation coefficient were calculated.

Table 15: Inter-correlations for Teaching Styles and Personality Types

Teaching Styles	**Personality Types**							
	E	**I**	**S**	**I**	**T**	**F**	**J**	**P**
EX	.276**	.308**	.294**	.144**	.323**	.247**	.229**	.214**
FA	.221**	.214**	.251**	.096*	.314**	.234**	.271**	.201**
PM	.366**	.285**	.307**	.242**	.374**	.373**	.303**	.220**
FA	.211**	.188**	.195**	.139**	.345**	.290**	.230**	.110*
D	.171**	.223**	.261**	.131**	.230**	.279**	.273**	.221**

Note: p*<0.05, p**<0.01

Note: **E** = Extrovert, **I** = Introvert, **S** = Sensing, **N** = Intuition, **F** = Feeling, **T** = Thinking, **J** = Judging, **P** = Perceiving, **EX** = Expert, **FA** = Formal Authority, **PM** = Personal Model, **FA** = Facilitator, **D** = Delegator

Simultaneous multiple regressions were conducted, with personality types being the independent variables and the five main teaching styles as the dependent variables.

Table 16: Multiple Regression Analysis for Teachers' Expert Teaching Style and Personality Type Subscales

Variable	B	β	*t*	Sig.	R	R^2	Adjusted R^2	F
EX	11.155		**4.74*** **	**.000**	.420	0.176	0.163	13.109
E	.101	.141	**2.46***	**.014**				
I	.1	.175	**3.259****	**.001**				
N	-.074	-.128	**-2.424***	**.016**				
T	.163	.204	**.892*****	**.000**				

Note: $p^*<0.05$, $p^{**}<0.01$, $p^{***}<0.001$

The model for teaching styles was as follow:

EX = 11.155+.101E+.1I- .074N +.163T

Note: EX = Expert Teaching Style, E = Extrovert, I = Introvert, N = Intuition, T=Thinking

Table 17: Multiple Regression Analysis for Teachers' Formal Authority Teaching Style and Personality Type Subscales

Variable	B	β	*t*	Sig.	R	R^2	Adjusted R^2	F
FA	9.769		**4.089*****	**.000**	.388	0.151	0.137	10.892
N	-0.094	-0.162	**-3.018****	**.003**				
T	0.161	0.203	**3.799*****	**.000**				

Note: $p^{**}<0.01$, $p^{***}<0.001$. The model for formal authority teaching style was follow.

FA = 9.769-0.094N+0.161T

Note: FA= Formal authority teaching style, N = Intuition, T= Thinking

Table 18: Multiple Regression Analysis for Teachers' Personal Model Teaching Style and Personality Type Subscales

Variable	B	β	*t*	Sig.	R	R^2	Adjusted R^2	F
PM	9.528		**4.774*** **	**.000**	.484	0.234	0.222	18.769
E	0.113	0.179	**3.249** **	**.001**				
T	0.126	0.18	**3.56*** **	**.000**				
F	0.09	0.197	**3.723*** **	**.000**				

Note: ***p<0.001, :**p<0.01 The model for personal model teaching style was as follow.

PM = 9.528+0.113E+ 0.126T+ 0.09F

Note: PM= Personal Model Teaching Style, E= Extrovert, T= Thinking, F= Feeling

Table 19: Multiple Regression Analysis for Teachers' Facilitator Teaching Style and Personality Type Subscales

Variable	B	β	t	Sig.	R	R^2	Adjusted R^2	F
FA	11.005		**4.723*** **	**.000**	.425	0.181	0.168	13.554
E	0.138	0.194	**3.406** **	**.001**				
N	-0.067	-0.117	**-2.218***	**.027**				
T	0.202	0.255	**4.878*** **	**.000**				
F	0.103	0.198	**3.63*** **	**.000**				
P	-0.076	-0.122	**-2.355***	**.019**				

Note: p*<0.05, p**<0.01, p***<0.001

The model for facilitator teaching style was as follow.

FA= 11.005+ 0.138E- 0.067N+ 0.202T+ 0.103F-0.076P

Note: FA = Facilitator teaching style, E= Extrovert, N= Intuition, T= Thinking, F= Feeling, P= Perceiving

Table 20: Multiple Regression Analysis for Teachers' Delegator Teaching Style and Personality Type Subscales

Variable	B	β	t	Sig.	R	R^2	Adjusted R^2	F
D	8.531		**3.102***	**.002**	.370	0.137	0.122	9.707
F	0.102	0.172	**3.069***	**.002**				
J	0.127	0.156	**2.933***	**.004**				

Note: *p<0.05 .The model for delegator teaching style was follow.

D = 8.531+ 0.102F + 0.127J

Note: D = Delegator teaching style, F= Feeling, J= Judging

Conclusion

In terms of teaching styles, teachers in Yangon Region were excelled in using expert and delegator teaching styles than those in Tanintharyi Region. Moreover, it can be found that teachers having age of 31-40 were better than teachers having age of 51-above in facilitator teaching styles. But there was no significant difference in teaching styles by service. According to the school such as urban school and rural school, significant difference had been found in facilitator teaching style. Teachers in rural schools were better in facilitator teaching styles than those in urban schools.

In terms of personality types, teachers in Yangon Region were higher in introvert, sensing and feeling personality types than teachers in Tanintharyi Region. It can be found that teachers having age of 51-above were higher in perceiving personality types than teachers having age of 20-30. According to teachers' services, there was significant difference in personality types.

The results showed that extrovert, introvert, intuition and thinking personality types were significant predictors of teachers' expert teaching style and intuition and thinking personality types were significant predictors of formal authority teaching style. Moreover, extrovert, thinking and feeling personality types were significantly related to personal model teaching style. Extrovert, intuition, thinking, feeling and perceiving personality types were significantly related to facilitator teaching style. It can also be seen that delegator teaching style was influenced by feeling and judging personality types.

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THE STUDY OF EMOTIONAL MATURITY AND ACADEMIC ACHIEVEMENT AMONG UPPER SECONDARY STUDENTS

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Abstract

The main purpose of this study is to investigate the relationship between the emotional maturity and academic achievement among upper secondary students. The study was conducted with a sample of 600 Grade 10 students (260 boys and 340 girls) studying in eight high schools from four districts of Bago Region in 2016-2017 Academic Year. For the data collection, the Emotional Maturity Questionnaire (EMQ) developed by Dr. Yashvir Singh and Dr. Mahesh Bhargava (2010) was used. The internal consistency (Cronbach's alpha) of EMQ is 0.886. Upper secondary students' emotional maturity, academic achievement and demographic data were examined and collected by using a questionnaire for survey method and quantitative research design. Data obtained were analyzed by using Statistical Package for Social Science (SPSS). It was found that Grade 10 students in this study possess a moderate level of emotional maturity and they also have an average level of academic achievement. The results of independent sample *t*-test revealed that there were no significant differences on Grade 10 students' emotional maturity and academic achievement by gender. The ANOVA results also revealed that there were significant differences on Grade 10 students' emotional maturity by father's occupation and sibling groups and, on the other hand, there were significant differences on Grade 10 students' academic achievement by schools, districts, father's education and mother's education. The positive correlation between emotional maturity and academic achievement among upper secondary students was significant at 0.001 level ($r = 0.339$, $p<0.001$). Again, multiple regression analysis was conducted to develop predicted model of emotional maturity and academic achievement of Grade 10 students. The result revealed that the two of five emotional maturity subscales namely emotional stability and emotional progression, made a significant predictive contribution to academic achievement of Grade 10 students.

Introduction

The classroom is an emotional place. Students frequently experience emotions in classroom settings. Quality emotions help students give their best

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potential in the classroom. All of these emotions can have important effects on students' learning and achievement. Emotions control the students' attention, influence their motivation to learn, modify the choice of learning strategies, and affect their self-regulation of learning. Furthermore, emotions are part of students' identity, and they affect personality development, psychological health and physical health (Nehra, 2014).

As emotions do play central role in the life of an individual, one is expected to have higher emotional maturity in order to lead an effective life. It is also true that one's behavior is constantly influenced by emotional maturity level that he possesses (Wadge & Ganaie, 2013). Emotional maturity is an important ingredient of modern civilization and is the essential attribute of the member of a progressive onward moving society. It helps for the growth of behavior and promotes a capacity to control a reasonable amount of frustration which results in students leading a happy healthy and peaceful life (Shafeeq & Thaqib, 2015). The development of emotion will lay a strong foundation for various development of a child's personality. Adolescents with high emotional maturity have better ability of managing, expressing and controlling themselves in every part of action (Geeta & Vijayalaxmi, 2006).

Education aims at all round development of the personality of the child. Education is meant for developing three domains i.e. cognitive, affective, and psycho-motor. Education mainly stresses to develop cognitive aspect which deals with knowledge and to some extent develop psycho-motor aspect which deals with motor skills. The affective aspect which deals with emotions, feelings and sentiments of the child is neglected by our education. For developing the child to be emotionally matured, only formal education is not enough but informal education which the child gets from his family and society is also needed.

Achievement is a particularly important consideration in the study of adolescence in contemporary society because of wide variation in levels of educational and occupational success. In the modern age of competition, all parents are worried about future of their children. Failure and poor achievement among upper secondary students are serious problems faced by educationists, teachers, parents and administrators in the present time. The most important question is to determine which students achieve more and under what conditions and also the factors which affect the process of education especially academic achievement that is why the present study has been conducted to investigate the relationship of emotional maturity and the academic achievement among upper secondary students

Objectives of the Study

The main purpose of the study is to investigate the relationship between emotional maturity and academic achievement of Grade 10 students in Bago Region.

Specific Objectives

1. To study the level of emotional maturity of Grade 10 students.
2. To compare the emotional maturity of Grade 10 students with respect to gender, school, district and other demographic variables.
3. To study the level of academic achievement among Grade 10 students.
4. To compare the academic achievement of Grade 10 students with respect to gender, school, district and other demographic variables.
5. To determine whether students' emotional maturity contribute to the prediction of their academic achievement.

Review of Related Literature

Emotional Maturity

One of the ways in which this country's destiny may be changed is to endow the next generation with maturity. Our emotional maturity is observed through our thoughts and behaviors. When we are faced with a difficult situation, our level of emotional maturity is one of the biggest factors in determining our ability to cope. "Emotional maturity means a balanced personality. It means ability to govern disturbing emotions, show steadiness and endurance under pressure and to be tolerant and free from neurotic tendencies" (Kour & Arora, 2014). Emotional maturity enables adolescents make better decisions, better choices and have more fun and less stress which enables them to have better balance in life.

Emotional maturity is influenced by several factors, both internal and external factors. Social atmosphere, the family environment and the communities related to the socialization processes that will influence the individual to express his emotions in daily behavior (Wani & Mashi, 2015).

Academic Achievement

"Academic achievement refers to the acquisition of all the behavioral changes associated with cognitive, affective and psychomotor domains" (Sangtam, 2014). The students' academic achievement plays an important role in producing the best quality graduates who will become great leaders and manpower of the country thus responsible for the country's economic and social development. Hence, academic achievement possesses a very imperative place in education as well as in the learning process. As this reason, every country has been tried to develop various learning processes for enhancing academic skills.

There are several factors that are responsible for high and low achievements of the students and these factors can be grouped into two broad classes: subjective factors and objective factors. Subjective factors include intelligence, learning ability, motivation, self-efficacy, learning style, study habits, creativity, level of aspiration, self-concept, locus of control, etc. Objective or environmental factors include socio-economic status, educational system, family environment, evaluation system, value system, teacher's efficiency, school situation, school environment etc (Aggarwal, 2013).

Environmental factors affect emotional maturity and academic achievement of a person. Environmental factors include home environment, working status of parents, number of siblings, place of living etc. Positive environmental factors form high emotional maturity leading to high self-confidence, high intelligence, healthy mind and easy adjustment, low stress and high academic achievement. In turn, it helps in excellent performance, organization success and satisfaction. Reverse is also true (Rajeshwari & John, 2015).

Method

Sampling

The sample of this study was composed of 600 Grade 10 Biology students from eight high schools at Bago Region by using simple random sampling technique. The participants of this study were chosen from four districts of Bago Region; Bago, Taungoo, Tharyarwaddy and Pyay. Two townships were selected from each district and one school was selected from each township. Among the sample, 43% (260) of participants were males and 57% (340) were female

Instrumentation

The Emotional Maturity Questionnaire (EMQ) developed by Dr. Yashvir Singh and Dr. Mahesh Bhargava (2010) was used to measure emotional maturity of upper secondary students. The EMQ contains 48 items under five categories: Emotional Stability, Emotional Progression, Social Adjustment, Personality Integration and Independent. The first four categories comprise 10 items each and the last contains 8 items. The participants have to answer a five- point likert format (1= never, 2= probably, 3= undecided, 4= much, 5= very much). Each response carries a score of ‘1’, ‘2’, ‘3’, ‘4’, and ‘5’respectively. The scores were transformed reversed scores. So, a higher score is indicative of high emotional maturity. The internal consistency (Cronbach’s alpha) of EMQ is 0.886.

And then, the participants were asked to furnish demographic data such as gender, school, district, parents’ education, parents’ occupation, and sibling groups. Data were collected through self-reported survey questionnaire.

Procedure

Firstly, the Emotional Maturity Questionnaire (EMQ) was found from the internet website. This questionnaire was adapted to Myanmar Version. To acquire real results, expert review was conducted for face validity and content validity by 14 experts from Yangon University of Education who have special knowledge and close relationship in the fields of Educational Psychology and

Educational Test and Measurement. According to their suggestions and recommendations, the questionnaire was modified.

And then, pilot study was conducted in the last week of November, 2016 with a sample of 64 Grade 10 students (26 males and 38 females) from No. (1), Basic Education High School, Thingangyun. For real data collection, Grade 10 Biology students were administered during December, 2016 and January, 2017.

Next, total achievement scores of Grade 10 students were collected from First Term Examination held in October, 2016 from their respective participating schools. The reason is that this exam was administered by using the same question in Bago Region. Therefore the scores obtained from this exam were fairly equal for all students. After accomplishing the data input process, data analysis and interpretation were conducted.

Data Analysis and Findings

Descriptive Analysis for Emotional Maturity of Grade 10 Students

Descriptive statistics revealed that differences in means and standard deviations with respect to each subscale of emotional maturity for Grade 10 students (See Table 1).

Table 1: Means and Standard Deviations for Emotional Maturity of Grade 10 Students

Variable	No. of Items	Mean%	SD
Emotional Stability	10	61.83	10.56
Emotional Progression	10	62.75	10.07
Social Adjustment	10	67.51	11.28
Personality Integration	10	67.44	10.21
Independence	8	63.32	9.72
Total	48	64.62	7.99

Note: SD = Standard Deviation

According to Table 1, it was clearly seen that the sample students reported having fairly high level of emotional maturity in social adjustment and personality integration but relatively low level in emotional stability, emotional progression and independence.

Emotional Maturity Levels of Grade 10 Students

Based on the descriptive analysis of emotional maturity, the upper secondary students (Grade 10 students) were identified into three groups by using a formula M ± SD (Mean ± Standard Deviation) (Polar & Thomas, 1995) (See Table 2).

Table 2: Emotional Maturity Levels of Grade 10 Students

Level of Emotional Maturity	N	Percentage
High	71	12%
Moderate	444	74%
Low	85	14%

So it can be assumed that the Grade 10 students in the study had fair emotional maturity.

Comparison for Emotional Maturity of Grade 10 Students by Gender

Based on the results of descriptive analyses, it can be said that male students are slightly higher than female students in emotional maturity.

Table 3: The Result of Independence Sample *t*-test on Emotional Maturity of Grade 10 Students by Gender

<table>
<tr><th rowspan="3">Emotional Maturity</th><th>Gender</th><th>N</th><th>Mean%</th><th>SD</th><th>t</th><th>df</th><th>p</th><th>Mean Difference</th></tr>
<tr><td>Male</td><td>260</td><td>65.24</td><td>8.08</td><td rowspan="2">1.663</td><td rowspan="2">598</td><td rowspan="2">.097</td><td rowspan="2">1.092</td></tr>
<tr><td>Female</td><td>340</td><td>64.15</td><td>7.90</td></tr>
</table>

The result of independent sample *t*-test described that there were no significant differences in emotional maturity by gender. This finding is consistent with that of earlier studied conducted by Kour M. (2001), Gakher (2003), Thukral, Praveen and Singh, Surjit (2010), and Lekhi (2015). But in contrast to the finding of Wani & Masih (2015).

Comparison of Students' Emotional Maturity by Father's Occupation

The descriptive statistics of emotional maturity for Grade 10 students by father's occupation was conducted. This analysis revealed that there were differences in mean scores by father's occupation in emotional maturity (See Table 4).

Table 4: Means and Standard Deviations for Grade 10 Students' Emotional Maturity by Father's Occupation

	Father's Occupation	**N**	**Mean%**	**SD**
Emotional Maturity	Dependent	26	65.03	9.65
	Random	44	65.58	7.70
	Others	440	64.93	7.84
	Government Servant	92	62.58	8.10

In order to examine whether these differences are statistically significant or not, one way analysis of variance (ANOVA) was conducted (See Table 5).

Table 5: ANOVA Results of Mean Comparison for Grade 10 Students' Emotional Maturity by Father's Occupation

Emotional Maturity	**Sum of Squares**	***df***	**Mean Square**	**F**	***p***
Between Groups	468.607	3	156.202	**2.468***	**.041**
Within Groups	37721.946	596	63.292		
Total	**38190.553**	**599**			

*The mean difference is significant at the 0.05 level.

Based on the results of ANOVA, it can be assumed that there was a significant difference in emotional maturity by father's occupation. After that, to find out which particular group had greatest difference, Post-Hoc test was conducted and significant differences were found among father's occupation groups (See Table 6).

Table 6: Result of Multiple Comparison (Post-Hoc) Test for Grade 10 Students' Emotional Maturity by Father's Occupation

Dependent Variable	(I) Group	(J) Group	Mean Difference (I-J)	*p*
Emotional Maturity	Others	Government Servant	**2.353***	**.042**

*The mean difference is significant at the 0.05 level.

According to the results, the students' emotional maturity had significance difference in government servant and other professions. Therefore it can be concluded that the other professional fathers' children had higher emotional maturity than the government servant fathers' children. This may be due to other professional fathers may mostly give more time and live with their children so that they can take care and guide their children closely. And their socioeconomic status may be better than the government servant fathers.

Comparison of Students' Emotional Maturity by Sibling Groups

Descriptive statistics were again conducted in order to find out differences in emotional maturity by sibling groups. This analysis revealed that there were slightly differences in mean scores by sibling groups in emotional maturity (See Table 7).

Table 7: Means and Standard Deviations for Grade 10 Students' Emotional Maturity by Sibling Groups

	Siblings	N	Mean%	SD
Emotional Maturity	Only One	48	67.60	7.53
	Small (2-4)	470	64.29	7.97
	Large (5 and above)	82	64.81	8.03

In order to examine whether these differences are statistically significant or not, one way analysis of variance (ANOVA) was conducted (See Table 8).

Table 8: ANOVA Results of Mean Comparison for Grade 10 Students' Emotional Maturity by Sibling Groups

Emotional Maturity	Sum of Squares	*df*	Mean Square	F	*p*
Between Groups	483.070	2	241.535	**3.824***	**.022**
Within Groups	37707.483	597	63.162		
Total	**38190.553**	**599**			

* The mean difference is significant at the 0.05 level.

Table 8 showed that the sibling groups differ significantly on emotional maturity. After that, to find out which particular group had greatest difference, Post-Hoc test was conducted and significant differences were found among siblings groups (See Table 9).

Table 9: Result of Multiple Comparison (Post-Hoc) Test for Grade 10 Students' Emotional Maturity by Sibling Groups

Dependent Variable	(I) Group	(J) Group	Mean Difference (I-J)	*p*
Emotional Maturity	Only One	Small Group	**3.319***	**.017**

*The mean difference is significant at the 0.05 level.

According to the result, the students' emotional maturity had significance difference in only one group and small group. Therefore it can be concluded that the only one group sibling students had higher emotional maturity than the small group students. This result may be due to only one group students get parents' care, love, secure, support and encouragement fully.

Descriptive Analysis of Academic Achievement for Grade 10 Students

Descriptive analyses revealed that the mean and standard deviation of academic achievement for the whole sample is 48.55 and 13.546 (See Table 10).

Table 10: Descriptive Analysis of Academic Achievement for Grade 10 Students

	No. of Students	Mean%	SD
Academic Achievement	600	48.55	13.546

Academic Achievement Levels of Grade 10 Students

Based on the descriptive analysis of academic achievement, the upper secondary students (Grade 10 students) were identified into three groups by using a formula M ± SD (Mean ± Standard Deviation) (Polar & Thomas, 1995) (See Table 11).

Table 11: Academic Achievement Levels of Grade 10 Students

Level of Academic Achievement	N	Percentage
High	86	14%
Moderate	418	70%
Low	96	16%

So it can be assumed that the Grade 10 students in the study had average academic achievement level. To understand more clearly, the following pie chart was drawn out showing the percentages of emotional maturity levels of Grade 10 students.

Comparison for Academic Achievement of Grade 10 Students by Gender

Based on the results of descriptive analyses, it can be said that male students and female students were almost the same in academic achievement.

Table 12: The Result of Independence Sample *t*-test on Academic Achievement of Grade 10 Students by Gender

	Gender	N	Mean%	SD	*t*	*df*	*p*	Mean Difference
Emotional Maturity	Male	260	48.36	13.75	-.287	598	.774	-.320
	Female	340	48.68	13.41				

The result of independent sample *t*-test described that there were no significant differences in academic achievement by gender. This finding is consistent with that of earlier studied conducted by De Smedt et. al. (2003), Sunitha (2005), Halawah (2006) and Singh & Praveen (2010). But in contrast to the finding of Aggarwal (1983), Leeson et. al. (2008), Garikai (2010) and Asthana (2011).

Comparison of Students' Academic Achievement by Schools

The descriptive statistics of academic achievement for Grade 10 students by schools was conducted. This analysis revealed that there were differences in mean scores by schools in academic achievement (See Table 13).

Table 13: Means and Standard Deviations for Grade 10 Students' Academic Achievement by Schools

	School	N	Mean%	SD
Academic Achievement	B.E.H.S(1) Bago	90	54.42	15.02
	B.E.H.S Thanatbyin	85	44.30	11.57
	B.E.H.S Yetarshe	90	53.88	11.60
	B.E.H.S Natsingon	85	48.78	13.74
	B.E.H.S Oakpho	65	47.81	12.20
	B.E.H.S Gyobinggauk	65	45.12	13.41
	B.E.H.S Branch Minkwat	60	43.12	13.84
	B.E.H.S Thegon	60	47.37	12.05

Table 14: ANOVA Results of Mean Comparison for Grade 10 Students' Academic Achievement by Schools

Academic Achievement	Sum of Squares	*df*	Mean Square	F	*p*
Between Groups	9844.061	7	1406.294	**8.319*** **	**.000**
Within Groups	100073.027	592	169.042		
Total	109917.088	599			

*** The mean difference is significant at the 0.001 level.

The results from Table 14 pointed out that there was a significant difference among schools at the 0.001 level.

Table 15: Result of Multiple Comparison (Post-Hoc) Test for Grade 10 Students' Academic Achievement by Schools

Dependent Variable	(I) Group	(J) Group	Mean Difference (I-J)	*p*
Academic Achievement	B.E.H.S 1 Bago	B.E.H.S Thanatbyin	10.119***	.000
		B.E.H.S Oakpho	6.612*	.039
		B.E.H.S Gyobinggauk	9.294***	.000
		B.E.H.S Branch Minkwat	11.297***	.000
		B.E.H.S Thegon	7.047*	.026
	B.E.H.S Yetarshe	B.E.H.S Thanatbyin	9.578***	.000
		B.E.H.S Gyobinggauk	8.753**	.001
		B.E.H.S Branch Minkwat	10.756***	.000

*** The mean difference is significant at the 0.001 level.
** The mean difference is significant at the 0.01 level.
* The mean difference is significant at the 0.05 level.

According to the results, there was a significant difference in academic achievement by schools. This may be due to B.E.H.S (1) Bago is the urban school and parents in that school assist their children in a variety of ways and take interest in their children' education. So, students in B.E.H.S (1) Bago had higher academic achievement. Again, B.E.H.S Branch Minkwat is changed from the middle school to B.E.H.S Branch. So it is a new school and it is insufficient to provide needs of students and teachers. And parental involvement, parental encouragement and school environment is needed. Therefore, students in B.E.H.S Branch Minkwat had lower academic achievement.

Comparison of Students' Academic Achievement by District

The descriptive statistics of academic achievement for Grade 10 students by districts was conducted. This analysis revealed that there were differences in mean scores by districts in academic achievement (See Table 16).

Table 16: Means and Standard Deviations for Grade 10 Students' Academic Achievement by District

	District	N	Mean%	SD
Academic Achievement	Bago	175	49.5	14.34
	Taungoo	175	51.4	12.91
	Tharyarwaddy	130	46.5	12.84
	Pyay	120	46.2	13.10

Table 17: ANOVA Results of Mean Comparison for Grade 10 Students' Academic Achievement by District

Academic Achievement	Sum of Squares	*df*	Mean Square	F	*p*
Between Groups	3455.877	3	1151.959	**6.449*** **	**.000**
Within Groups	106461.211	596	178.626		
Total	109917.088	599			

*** The mean difference is significant at the 0.001 level.

Based on the results of ANOVA, it can be assumed that there was a significant difference among districts at the 0.001 level.

Table 18: Result of Multiple Comparison (Post-Hoc) Test for Grade 10 Students' Academic Achievement by District

Dependent Variable	(I) Group	(J) Group	Mean Difference (I-J)	*p*
Academic Achievement	Bago	Pyay	**4.257***	**.037**
	Taungoo	Tharyarwaddy	**4.935****	**.008**
		Pyay	**6.155****	**.001**

** The mean difference is significant at the 0.01 level.
* The mean difference is significant at the 0.05 level.

According to the results, the students in Bago District had higher academic achievement than the students in Pyay District. And, the students in Taungoo District had higher academic achievement in Tharyarwaddy District and Pyay District.

Comparison of Students' Academic Achievement by Father's Education

The descriptive statistics of academic achievement for Grade 10 students by father's education was conducted.

Table 19: Means and Standard Deviations for Grade 10 Students' Academic Achievement by Father's Education

	Father's Education	N	Mean%	SD
Academic Achievement	Uneducated	108	48.94	13.64
	Primary	48	45.82	12.40
	Middle	161	46.26	13.19
	High	166	49.53	12.97
	High Pass	54	47.44	16.49
	Graduate	63	54.15	12.29

Table 20: ANOVA Results of Mean Comparison for Grade 10 Students' Academic Achievement by Father's Education

Academic Achievement	Sum of Squares	*df*	Mean Square	F	*p*
Between Groups	3424.789	5	684.958	**3.821****	**.002**
Within Groups	106492.299	594	179.280		
Total	109917.088	599			

** The mean difference is significant at the 0.01 level.

Based on the results of ANOVA, it can be found that there was a significant difference in academic achievement by father's education at 0.01 level.

Table 21: Result of Multiple Comparison (Post-Hoc) Test for Grade 10 Students' Academic Achievement by Father's Education

Dependent Variable	(I) Group	(J) Group	Mean Difference (I-J)	*p*
Academic Achievement	Graduate	Primary	**8.334***	**.015**
		Middle	**7.897****	**.001**

**The mean difference is significant at the 0.0l level.
*The mean difference is significant at the 0.05 level.

According to the Table, it can be concluded that the graduated fathers' children were cleverer in their academic than the children of fathers who had primary and middle education.

Comparison of Students' Academic Achievement by Mother's Education

The descriptive statistics of academic achievement for Grade 10 students by mother's education was conducted.

Table 22: Means and Standard Deviations for Grade 10 Students' Academic Achievement by Mother's Education

	Mother's Education	**N**	**Mean%**	**SD**
Academic Achievement	Uneducated	126	48.18	13.01
	Primary	81	45.47	13.16
	Middle	168	47.36	14.25
	High	137	49.44	12.56
	High Pass	38	50.69	15.13
	Graduate	50	54.38	12.85

In order to examine whether these differences are statistically significant or not, one way analysis of variance (ANOVA) was conducted (See Table 23).

Table 23: ANOVA Results of Mean Comparison for Grade 10 Students' Academic Achievement by Mother's Education

Academic Achievement	**Sum of Squares**	***df***	**Mean Square**	**F**	***p***
Between Groups	3003.788	5	600.758	**3.338****	**.006**
Within Groups	106913.300	594	179.989		
Total	109917.088	599			

** The mean difference is significant at the 0.01 level.

Based on the results of ANOVA, it can be assumed that there was a significant difference in academic achievement by mother's education. To obtain more detail information of which particular group had the differences, Post-Hoc Test was executed.

Table 24: Result of Multiple Comparison (Post-Hoc) Test for Grade 10 Students' Academic Achievement by Mother's Education

Dependent Variable	**(I) Group**	**(J) Group**	**Mean Difference (I-J)**	***p***
Academic Achievement	Graduate	Primary	**8.905****	**.003**
		Middle	**7.020***	**.015**

**The mean difference is significant at the 0.01 level.
*The mean difference is significant at the 0.05 level.

According to the Table 24, it can be concluded that the graduated mothers' children were cleverer in their academic than the children of mothers who had primary and middle education. This may be due to more educated parents are more interested in their children' education and can support and guide them better. This result is consistent with of earlier studied conducted by Saini (1977), Baker & David (1986), Kohl et. al.(2000) and Muola (2010).

Relationship Between Emotional Maturity and Academic Achievement of Grade 10 Students

Table 25: Pearson Product Moment Correlation Analysis Between Emotional Maturity and Academic Achievement of Grade 10 Students

		Emotional Maturity	**Academic Achievement**
Emotional Maturity	Pearson Correlation	1	**.339*****
	Sig. (2-tailed)		**.000**
	N	600	600

***Correlation is significant at the 0.001 level (2-tailed).

Table 25 indicates that there was positive correlation between emotional maturity and academic achievement with coefficient of r = .339 at 0.001 significant level. Therefore, it can be concluded that the higher a student' emotional maturity is, the higher his or her academic achievement is.

Regression Analysis of Emotional Maturity on Academic Achievement of Grade 10 Students

In order to investigate the predictive power of emotional maturity to academic achievement of students, multiple regression analysis was conducted.

Table26: Multiple Regression Analysis Summary for Predictors Predictor Powers of Emotional Maturity on Academic Achievement

	B	β	t	R	R2	Adj R2	F
Constant	11.295		2.606	.339	.118	.110	15.84
Emotional Stability (ES)	0.175	.136	2.788				
Emotional Progression (EP)	0.150	.111	2.182				

Academic Achievement = 11.295+ 0.175ES+ 0.15EP

Table 26 indicated that the two subscales of students' emotional maturity; emotional stability and emotional progression significantly predicted 11% of variance in academic achievement.

Conclusion

Suggestions

According to the obtained results, some recommendations have been presented to improve the knowledge about adolescent emotional maturity in daily life affair. As the role of parents, they should encourage their children to become emotional mature. Parents should help their children to maintain a harmonious relationship with everybody in home and outside so that they can share their feelings and problems with them. If parents fail to provide child a close warm, emotional support then the child become anxious, hostile, defensive and confused person. Parents should never discourage their children for low academic achievement instead they must encourage their children to achieve more and more. Parents should not try to achieve their ambitions through the children and also set realistic goals according to the capabilities of the child. Children should be given freedom to choose their own vocations of streams and achieve their goals.

Emotional maturity not only affects child's physical growth but also his emotional development. By providing love and affection, child feels more secure and in turns, he or she becomes emotionally balanced (Shanmuganathan & Chinnappan , 2014). Parents and school should provide protective and enriched environment to increase secure experiences. Parents and teachers should behave gently and rationally to encourage children doing for positive and useful activities.

Teachers play a pivot role in shaping the personality of the child. The teachers can influence the children by their behavior, thoughts and actions and also enable them to solve their problems which lead to lesser anxiety and better health. Teachers should be well trained in understanding the problems of students. Moreover, teachers should diagnose the problems of poor academic achievement. The teachers should provide independent and secure atmosphere to children for good academic achievement and emotional maturity. Children should be given educational, vocational and personal guidance so that they can determine their goals and become successful in various fields and adjust properly.

Administration should provide other facilities for co-curricular activities in the schools. Administration should make available the facility of guidance and counseling services for the students in schools. School authorities should provide better facilities for attaining high academic achievement. The curriculum should be constructed keeping in view the needs of students, problems and requirements of every individual. Educational system should know the components of emotional maturity and should try to improve its educational plans. Educational system should also provide counselors or psychological professionals' services to help the students to grow emotionally mature and, hold family training meetings for parents. Frequent meetings will make able the parents to know about their children performance and they start interfering in the children matter and this leads to better emotional relation between parents and children and this will certainly improve emotional maturity of their children.

Limitations of the Study

Despite the contribution of the study, there are some limitations that need further examination and investigation. First, the research area is restricted to Bago Region and the participants were drawn from only eight schools. Though eight schools were already drawn from different townships to enhance validity, the results may not applicable to other geographical locations or to other schools across the country. Second, in case of a study of emotional maturity and academic achievement, longitudinal design is more desirable, for example, from lower secondary school to upper secondary school or from upper secondary school to higher education level. Due to the scarcity of time and resources, such design is impossible for this study. Therefore, relationships over time between emotional maturity and academic achievement could not be addressed. Third, the sample of the study comprises only Grade 10 students. The results may not represent all Grade 10 students in Myanmar. Fourth, the sample of the study is Biology combination students so that this result may not represent other combination students. Fifth, the quality of questions involved the test was not analyzed and the achievement scores were emphasized due to time limitation.

Future Research

The limited study area pointed out the necessity to conduct a nationwide study to gather adequate information on the subject to be able to generalize. A study of longitudinal design is necessary to clarify grade differences and age differences and should be extended to explore the effectiveness of emotional maturity. The future researchers should conduct the studies with large sample size from different states and regions to be more reliable and valid. And this study can be conducted with other combination students. The future researchers should construct the tests themselves and analyze the quality of the tests so that more credit results will get. This research was conducted with quantitative study only. Therefore, further research should be done with both quantitative study and qualitative study-observations and in-depth interviews with students in order to support the findings of the study. Furthermore, the future researchers should consider the contributions of other factors such as other psychological variables, socioeconomic status, different cultural background, family, teacher and peer's contributions to students' emotional maturity and academic achievement.

Therefore, this study has empirically proved that there is relationship between emotional maturity and academic achievement among upper secondary students. This study leads to be better understanding of psychological factors that may influence the upper secondary students in Basic Education High Schools. This may also help to improve the level of emotional maturity and academic achievement.

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RELATIONSHIP BETWEEN LOGICAL-MATHEMATICAL INTELLIGENCE AND CREATIVE PROCESS OF MIDDLE SCHOOL STUDENTS

Khin Shun Lae Oo[1], Moe Moe Naing[2]

Abstract

The main purpose of this study was to investigate the relationship between the logical-mathematical intelligence and creative process of middle school students. Both quantitative and qualitative approaches were used in this study. A total of 804 Grade 6 and Grade 7 students from each district of Yangon Region participated as the sample of the study using stratified random sampling technique. For this study, Mathematical Intelligence test (α = 0.79)(Moe Moe Naing, 2008) and Creative Process Questionnaire (α = 0.66) developed by Whetton and Cameron (2011) and Chen, Runco, Lin and Chiou (2008) were used as instruments. After conducting the statistical analysis, the findings revealed that there was a significantly positive relationship between logical-mathematical intelligence and creative process (r=0.094). For logical-mathematical intelligence, there were significant differences as gender, grade level and region. Difference in creative process was found only in school. Female students were higher than male students in mathematical intelligence and Grade 7 students performed better than Grade 6 students in mathematical intelligence. As the result of ANOVA, students from all other schools outperformed on creative process than students from Yankin Teacher Training Centre. According to the interview results, most of the students (more than 57%) showed negative behaviors and characteristics, with no interest in Mathematics and they weren't enjoyable to participate in taking Mathematical Intelligence Test. And, most of the students (about 75%) showed that they had positive and desirable behaviors and motivation in creative process, even though there was no chance to create in real life situations.

Keyword: Logical-Mathematical Intelligence, Creativity, Creative Process

Introduction

No nation whether big or small can afford to overlook the importance of creativity in this age of competition. In our contemporary society in which individuals have to adjust constantly to new problems and find original solutions, creativity is indeed a feature that has become increasingly

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important. In order to solve any problem, knowledge should be applied in the right manner with the help of intelligence. According to the multiple intelligences theory (Gardner, 1983, 1999), logical-mathematical intelligence is activated in situations requiring problem solving or meeting a new challenge as well as situations requiring pattern discernment and recognition.

Creativity can be seen as the ability of man to establish new relationships to change reality. To change reality, the "creative" process is very important simply because it sdistinguishes normal thinking from psychotic one. Creative imaginations establish links between activities and the answers to multi-faceted questions (Pérez-Fabell & Campos, 2011). Logical-mathematical intelligence consists of the capacity to analyze problems logically, carry out mathematical operations, and investigate issues scientifically. In Howard Gardner's words, it entails the ability to detect patterns, reason deductively and think logically. This intelligence is also associated with scientific and mathematical thinking.

Modern society accords high prestige to logical-mathematical intelligence. So thus it can be said that a person's logical intelligence manifests itself through different activities and not through a particular activity (Gupta & Basu, 2006). This is also reflected in the systems of education. Entrance into most institutions of higher learning tends to rely heavily on performance on tests of Logical-mathematical intelligence. It is a fairly common place observation that most children are very creative. Rigorous studies involving tests of creative ability have determined that the processes of formal education and socialization into organizations over many years where the focus is predominantly on logical-mathematical intelligence robs students of the creative flame. Traditionally, researchers used to pay much more attention to the product of the creative process. In an educational situation, emphasis should be on the process.

Regularly, however the concept of creativity is related with intelligence, several early researchers (Andrews, 1930; Getzels & Jackson, 1962) have been shown the relation between creativity and intelligence has only modest correlations. Many research findings and observations have demonstrated that there is no positive correlation between creativity and intelligence. There has been debate in the psychological literature about whether intelligence and creativity are part of the same process or represent distinct mental processes. According to Barron, Guilford or Wallach and Kogan, from the 1950s onwards, suggested that correlations between these concepts were low enough to justify treating them.

Such ambiguous findings arouse to find out whether the dimension of creativity, particularly creative process is related with logical-mathematical intelligence among the dimensions of multiple-intelligence. So, the researcher explored whether the factors influencing the creative process is related with the logical-mathematical intelligence. In terms of education and related areas, creativity and logical-mathematical intelligence are very much essential elements which are necessary for learning. If education strives to prepare children for a productive life in society, the educational system must accept responsibility for supporting and developing creativity and intelligence by motivating them.

Aim of the Study

The aim of this study was to explore the relationship between logical-mathematical intelligence and creative process of middle school students.

Definitions of the Key Terms

Logical-Mathematical Intelligence

According to Wily Walnut (2004), logical-mathematical intelligence is the capacity to reason, calculate, recognize patterns and handle logical thinking.

Creativity

According to Sternberg (2000), creativity is a skill that can be sharpened, and not due to natural ability.

Creative Process

Creative process denotes the actual experience of being creative. The Geneplore model presented by Finke, Ward and Smith (1992) describes two phases of framework; generation (building structure pre-inventive) and exploration (evaluating possible alternatives and choosing the best).

Characteristics of Creative Process; Chen, Runco (2008) and Yeh (2011) proposed that the characteristics of creative personality were curiosity, adventure, challenge, imagination, autonomy, self-control, strain, sensitivity, working hard, courage, self-confidence, perseverance, and optimism.

Abilities of Creative Process; Chen (2008) proposed sensitivity, fluency, flexibility, originality, and the elaboration of five creative abilities.

Barriers of Creative Process; Three levels of individual aspects, problems-solving, environment and organization were included in barriers.

Motivation of Creative Process; The intrinsic motivation was the most critical factor for creativity.

Review of Related Literature

What is Logical-Mathematical Intelligence?

Wily Walnut (2004) defined logical-mathematical intelligence as the capacity to reason, calculate, recognize patterns and handle logical thinking. Logical-Mathematical Intelligence traits:

- likes to count
- likes to be organized
- is very precise
- good at problem-solving
- recognizes patterns
- likes math games
- likes to experiment in a logical way
- orderly note-taking
- ability for abstract thinking
- likes computers

This intelligence is often associated with "scientific thinking." It makes it possible to calculate, quantify, consider propositions and hypotheses, and carry out complex mathematical operations. It is responsible for the various patterns of thinking used in daily lives, such as making lists, creating a schedule, setting priorities, and planning something for the future.

In Piaget's view, the logical-mathematical understanding constituted the primary focus from one's actions upon the world. The logical reasoning is the central factor of intelligence. The logical intelligence in the child early months is related to his moment to moment experience with them about 18 months After then, logical-mathematical skills begin with the handling of real objects and numerical operations gradually became internalized age. At the formal operational age, child use, words or symbols to stand for objects, he can work with hypothetical statements and explore logical relationships between statements (as cited in Gardner, 1983).

Logical-Mathematical Learner

If the students dominate upon mathematics intelligence, they think conceptually and abstractly and are able to see patterns and relationships that others often miss. They like to experiment, solve puzzles and other problems, ask cosmic questions, and think. They generally enjoy working with numbers and mathematical formulas and operations. They love the challenge of a complex problem to solve. They tend to be systematic and analytical, and they always have a logical rationale or argument for what they are doing or thinking. These students can be helped by encouraging them to develop fully and use their logical thought process (Lazear, 2004).

Due to these characteristics of logically and mathematically minded people, certain learning and studying techniques are more effective if they incorporate logic and order. For example, while studying or preparing something that needs to be memorized, making lists of key concepts or important aspects to remember is a very effective way for these learners to commit the material to memory. Additionally, searching for links and connections between different portions of the material will make it easier to understand for these learners; creating patterns is always a good idea if the brain tends to search for patterns and identify them easily. These techniques are particularly helpful when studying or learning material that doesn't involve mathematics or sciences; these topics can be more difficult to grasp and understand for logical mathematical learners.

Strategies to Assist the Logical-Mathematical Learner

Once students or children have been identified as logical-mathematical learners, it is important to assist them to develop strategies so that they can apply their learning strength to all areas of the curriculum. Armstrong (2001) described some key strategies as parents or teachers that can easily be applied to the classroom or home to assist a logical-mathematical learner.

- As a teacher, encourage opportunities to discuss numbers both inside and outside of mathematics and science. By doing this, the teacher will better engage highly logical learners; while the other students can see that mathematics does not just belong in a mathematics class.
- Use classification and categorization. Learners can do this in any class at school or at home. For example in a Science class, learners could be asked to put a certain examples under the heading of gas, liquid and solid.
- Bring Science terminology into any classroom or at home.
- Take part in Socratic questioning. Instead of talking to the learner, the teacher or parent serves as a questioner of student's points of view. Until the learner has reached an opinion, the teacher/parent participates in dialogues with them (as cited in Lazear, 2004).

Creativity

Creativity is the ability to describe the opportunity in every challenge. Creativity means having a choice in any situation (Zelinski 1994). Maimunah (2004) states that creativity starts with a creative thinking that generates ideas towards solving problems, making improvements, increasing productivity, enhancing effectiveness and adding values. Creativity is a collection or set of attitudes, and the driving ability of individuals to generate original and new ideas (Fisher 1990).

Creative individuals often elicit negative reactions from others by violating social norms and expectations. In a school setting, care should be taken to distinguish creative students from students who cause disturbances due to emotional or social problems. Creative students who find ways to engage others in their projects are likely to become outgoing and adopt leadership roles. Creative students who experience difficulties in this regard are likely to engage in individual projects. In short, high creativity is compatible with both social and individualistic life styles; either outcome is healthy.

Creative Process

The creative process requires high levels of intelligence through personal judgment, flexibility and autonomy (Hall & Johnson, 2009). The mental and cognitive processes used in creative thought become unique as 'principles and elements of knowledge and insights that have not been connected before' (Ekvall, 1997, p. 195). Divergent thinking creates a flexible and unstructured platform for combining a vision of alternative realities with the practical aspects of established and current principles. This combining and reorganizing of derived knowledge and information to advance the thinking process and in turn to generate new ideas appears to be key to the creative process (Mumford, 2000).

Factors Influencing the Creative Process

The factors influencing creative process should be able to measure four variables comprising of characters, abilities, barriers, and motivation changed over time at difference levels following the teaching course in their further education of creative thinking. General education in Taiwan have emphasized on the creative-teaching and creative-thinking for almost ten years. The literature review focused on education areas was divided into four sections as characteristics, abilities, barriers, motivation for creativity.

For the characteristics of creativity, Chen (2008) proposed that the characteristics of creative personality were curiosity, adventure, challenge, and imagination. Runco (2008) provided autonomy, self-control, strain, sensitivity, and tolerance of being ambiguous, and paradox as temperaments of creativity. Yeh (2011) indicated working hard, courage, self-confidence, perseverance, and optimism as the characteristics of creators.

Regarding the abilities of creativity, Chen (2008) proposed sensitivity, fluency, flexibility, originality, and the elaboration of five creative abilities. For barriers to creativity, according to Chen, three levels of individual aspect, problems-solving, environment and organization were proposed. Regarding the motivation for creativity, Lin and Chiou (2008) suggested that the intrinsic motivation was the most critical factor for creativity.

Human Brain Hemisphere

According to Leslie Wessman (2004), the logical-mathematical intelligence represents an intriguing mix of left and right-brain hemisphere processes. On the one hand, the ability to read and produce mathematical signs & symbols is a left-hemisphere processing mode. On the other hand, the ability to understand numerical relationships, to discern abstract patterns, and to comprehend logical-mathematical concepts and formulas is a right-hemisphere processing mode. The right hemisphere may be particularly good at supporting ‘divergent’ thinking and creativity more widely. In general, the hemispheres work together in harmony, although often the right hemisphere is underutilization. And really it is this hemisphere that is important for education and for fostering creativity. The challenge for teachers is how to find ways of fostering creativity that feeds the right brain as well as the left, for all children (as cited in Lazear, 2011).

Method and Procedures

Participants of the study

Pilot tests were administered to a sample of 40 students from Grade 6 and Grade 7 (21 males and 19 females) from BEHS, Pyin-htaung-kyaung, Thanlyin Township in Yangon Region to test whether the wording of the items, statements and instructions had comprehensiveness. For field testing, the sample consists of 804 of Grade 6 and Grade 7 students from eight high schools and middle schools located in Yangon Region. They were 389 boys and 415 girls.

Instrumentation

To examine the level of logical-mathematical intelligence of the middle school students, Mathematical Intelligence Test developed by Moe Moe Naing (2008) was used. To investigate the creative process in the students, Creative Process Questionnaire developed by David A. Whetton and Kim S. Cameron (2011) and Chen, Runco, Lin and Chiou (2008) were used.

This questionnaire consists of 56 items of factors influencing creative process included characters (23 items), abilities (11 items), barriers (11 items), and motivation (11 items). There are 10 negative items. For negative items, five-point likert scales (4= Strongly Disagree to 0= Strongly Agree) was used and for positive 46 items, the values are assigned as (0= Strongly Agree to 4 = Strongly Disagree) was used in this questionnaire. The internal consistency (Cronbach's Alpha) of the Creative Process Questionnaire was 0.66 and the internal consistency of the Mathematical Intelligence Test was 0.79.

In order to indicate the students' strengths and weaknesses in Mathematical Intelligence Test, the following scoring system was used.

Table 1: Scoring System for Mathematical Intelligence Test

Scoring Point	Understanding	Solution	Explanation
4	Complete Understanding	Correct Solution	Complete Explanation
2 or 3	Some Difficulty	Almost Correct	Incomplete Explanation
1	Poor Understanding	Attempt	Poor Explanation

Procedure

Permission to collect data was granted by the head masters of the participating high schools. The selected 389 male and 415 female Grade 6 and Grade 7 students from selected eight high and middle schools from each district in Yangon Region were tested by self-reported questionnaire to get the necessary data. The data obtained from the field tests were analyzed with the help of the SPSS statistical program (version 22) and the Microsoft Office Excel Program.

Data Analysis and Findings

Comparison of Logical-Mathematical Intelligence and Creative Process by Gender

According to the previous researches, there were gender differences in logical-mathematical intelligence and creative process. Therefore, to find out whether gender differences in logical-mathematical intelligence and creative process were or not, the following analysis was also conducted.

Comparison of Logical-Mathematical Intelligence by Gender

Descriptive analysis revealed the difference in mean and standard deviation of Logical-Mathematical Intelligence by gender. There was slight difference between the mean score of the male and female students in Logical-Mathematical Intelligence. To find out whether these differences were significant or not, the independent sample t-test was conducted. From the results of independent sample t-test, there were statistically significant differences with regard to gender.

Table 2: The Results of Independent Sample t-test of Logical-Mathematical Intelligence by Gender

Gender	N	Mean	Std. Deviation	t	Sig.(2-tailed)
Male	389	48.03	12.61	-3.451**	0.001
Female	415	51.01	11.89		

** The mean difference is significant at 0.01 level.

Comparison of Creative Process by Gender

To find out the differences in creative process between male and female students, descriptive analysis revealed the difference in means and standard deviation of creative process by gender. There was slight difference between the mean score of the male and female students in the subscales of creative process. The mean score of the male students was lower than that of the females in both subscales of character and abilities. But mean score of the male students was higher than that of the females in subscale of barriers and subscale of motivation was equally performed by gender. Visual presentation was given in figure 1.

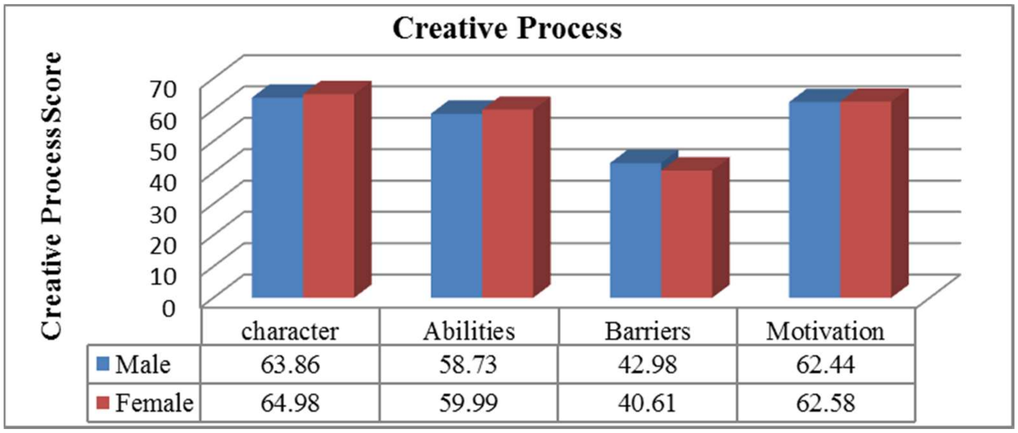

Figure 1: Mean Comparison of Creative Process by Gender

To find out whether these differences are significant or not, the independent t-test was conducted

Table 3: The Results of Independent Sample t-test for Subscales of Creative Process by Gender

Creative Process	t	df	Sig. (2-tailed)	Mean Difference
Character	.77	802	.444	.46
Abilities	-.77	802	.439	-.59
Barriers	.13	802	.894	.10
Motivation	.36	802	.720	.28

Therefore, according to the result of t-test, there was no significant difference for all the subscales of creative process by gender.

Comparison of Logical-Mathematical Intelligence and Creative Process by Grade

As the subjects of this study were selected from Grade 6 and Grade 7 students in Yangon Region, different educational levels might affect their grades in logical-mathematical intelligence and creative process.

Comparison of Logical-Mathematical Intelligence by Grade

To find out differences in logical-mathematical intelligence by grade, the mean and standard deviation of criteria in logical-mathematical intelligence between grades was statistically analyzed (See Table 4). To find out whether these differences are significant or not, the independent t-test was conducted.

Table 4: The Results of Independent Sample t-test of Logical-Mathematical Intelligence by Grade

Grade	N	Mean	Std. Deviation	t	Sig.(2-tailed)
Grade 6	384	46.82	12.92	-6.187***	0.000
Grade 7	420	56.08	11.19		

*** The mean difference is significant at 0.001 level.

From the results of Table 4, there were statistically significant difference with regard to grade. Grade 7 students were significantly higher than Grade 6 students in logical-mathematical intelligence.

Comparison of Students' Creative Process by Grade

To find out differences in creative process by grade, the mean and standard deviation of subscales of creative process between grades was statistically analyzed. Visual presentation is shown in figure 2.

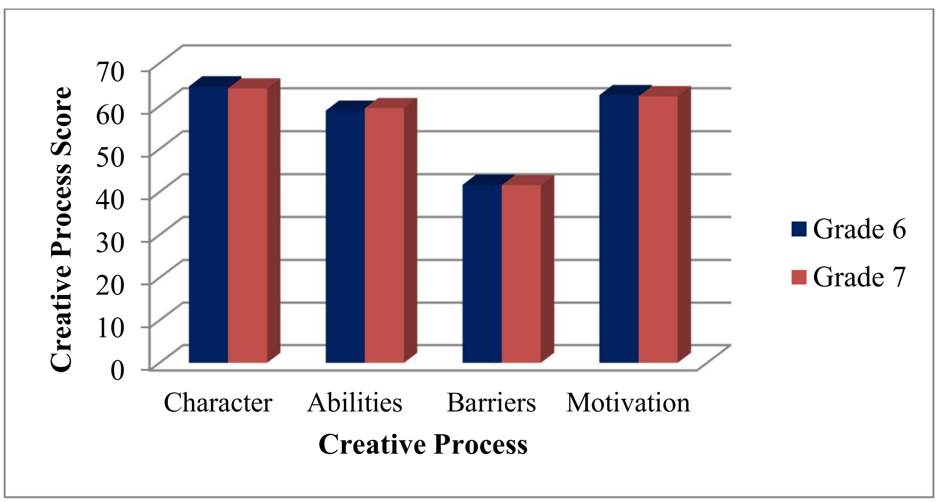

Figure 2: Mean Comparison of Creative Process by Grade

According to the results of the table 8, there was no significant difference between the mean score of the Grade 6 and Grade 7 students in the subscales of creative process. The mean scores of the Grade 6 students for all subscales were nearly equal to that of the Grade 7 students.

Comparison of Logical-Mathematical Intelligence and Creative Process among Districts

Although the sample of subjects was selected from almost the same age level, different geographical location may have different socioeconomic status. Accordingly, to find out the differences of logical-mathematical intelligence and creative process for four districts from Yangon Region, one way analysis of variance (ANOVA) was computed.

Table 5: ANOVA Results of Students' Logical-Mathematical Intelligence and Creative Process among Districts

Variables		Sum of Squares	df	Mean Square	F	Sig.
Logical-Mathematical Intelligence	Between Groups	2194.91	3	731.64	6.158***	.000
	Within Groups	95049.70	800	118.81		
	Total	97244.61	803			
Creative Process	Between Groups	369.15	3	123.05	2.140	.094
	Within Groups	46005.57	800	57.51		
	Total	46374.71	803			

*** The mean difference is significant at 0.001 level.

ANOVA results showed that there were significant differences in students' logical-mathematical intelligence among districts from Yangon Region. To obtain more detailed information, Post-Hoc test was executed by Tukey HSD method and this results showed that the students' logical-mathematical intelligence from West District were higher than that of East, South and North Districts and they were significantly different at 0.05 level.

Table 6: The Results of Tukey HSD Multiple Comparison for Students' Logical-Mathematical Intelligence among Districts

Dependent Variable	(I) Districts	(J) Districts	Mean Difference (I-J)	Std. Error	Sig.
	West	East	2.943*	1.07	.030
		South	3.332*	1.08	.011
		North	4.421*	1.09	.000

* The mean difference is significant at 0.05 level.

Comparison of Students' Logical-Mathematical Intelligence and Creative Process among Schools

Next, although the sample of subjects was selected from public schools with the same curriculum, teaching styles of their respective teachers might be difference. So, to find out the differences of students' logical-mathematical intelligence and creative process among schools from Yangon Region, one way analysis of variance (ANOVA) was computed. ANOVA results showed that there were significant differences in students' logical-mathematical intelligence among schools from Yangon Region at 0.05 and creative process at 0.001 level.

Table 7: ANOVA Results of Students' Logical-Mathematical Intelligence and Creative Process among Schools

Variables		Sum of Squares	df	Mean Square	F	Sig.
Logical-Mathematical Intelligence	Between Groups	2205.01	7	315.00	2.638	.011
	Within Groups	95039.60	796	119.40		
	Total	**97244.61**	**803**			
Creative Process	Between Groups	1608.85	7	229.84	4.087***	.000
	Within Groups	44765.86	796	56.24		
	Total	**46374.71**	**803**			

*** The mean difference is significant at 0.001 level.

To obtain more detailed information of a particular group, Post-Hoc test was executed by Tukey HSD method. (See Table 8)

Table 8: The Results of Tukey HSD Multiple Comparison for Students' Creative Process among Schools

Dependent Variable	(I) School	(J) School	Mean Difference (I-J)	Std. Error	Sig.
Creative Process	Yankin TTC	B.E.H.S(1) Thingangyun	-4.807*	1.05	.000
		B.E.H.S(2) Kamayut	-4.073*	1.04	.003
		B.E.H.S(2) Lanmataw	-4.449*	1.08	.001
		B.E.H.S(2) Thanlyin	-4.106*	1.06	.003
		B.E.H.S(1) Kyauktan	-3.448*	1.10	.039

* The mean difference is significant at 0.05 level.

The Results showed that students' creative process from Yankin TTC were lower than B.E.H.S(1) Thingangyun, B.E.H.S(2) Kamaryut, B.E.H.S(2) Lanmadaw, B.E.H.S(2) Thanlyin, and B.E.H.S(1) Kyauktan. So, it can be assumed that students from Yankin TTC may be more emphasis on memorization than other schools.

Relationship between Students' Logical-Mathematical Intelligence and Creative Process

Many research findings and observations have demonstrated that there is no positive correlation between creativity and intelligence. So, to find out the relationship between logical-mathematical intelligence and creative process of Myanmar Middle School Students from Yangon Region, the correlation coefficient was calculated. These results were summarized in below.

Table 9: Correlation between Logical-Mathematical Intelligence and Creative Process

		Creative Process
Logical-Mathematical Intelligence	Pearson Correlation Sig. (2-tailed)	.094** .007

**.Correlation is significant at 0.01 level (2-tailed).

According to Table 9, there was significantly positive correlated between logical-mathematical intelligence and creative process at 0.01 significant level but the value of coefficient is very low. So, the following analysis was conducted whether the logical-mathematical intelligence is also related with the factors influencing the creative process.

Table 10: Correlation between Logical-Mathematical Intelligence and Factors influencing Creative Process

		Logical-Mathematical Intelligence
Character	Pearson Correlation Sig. (2-tailed)	.114** .001
Abilities	Pearson Correlation Sig. (2-tailed)	.106** .003

**. Correlation is significant at the 0.01 level (2-tailed).

According to Table 10, the findings showed that there were positive correlations among logical-mathematical intelligence, character and abilities of (factors influencing creative process). So, it can be expected that students with high logical-mathematical intelligence could contribute to students' curiosity, challenge, imagination, sensitivity, fluency, flexibility and elaboration which were similar with the result proposed by Chen (2008).

The values of the correlation coefficients of logical-mathematical intelligence, creative process and factors influencing creative process would be low. It may be due to the fact that the ability to read and produce mathematical signs & symbols (logical-mathematical intelligence) is a left-hemisphere processing mode and the right hemisphere may be particularly good at supporting 'divergent' thinking and creativity more widely.

Levels of Students' Logical-Mathematical Intelligence and Creative Process of Myanmar Middle School Students

According to the percentile analysis, students' logical-mathematical intelligence and creative process were categorized into high, middle and low groups.

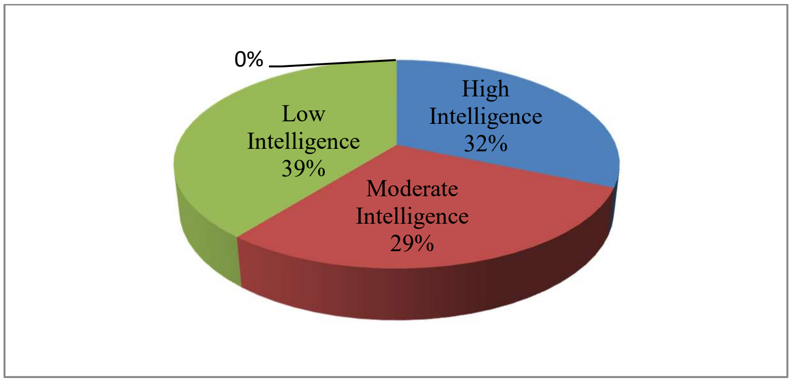

Figure 3: Level of Logical-Mathematical Intelligence of Middle School Students

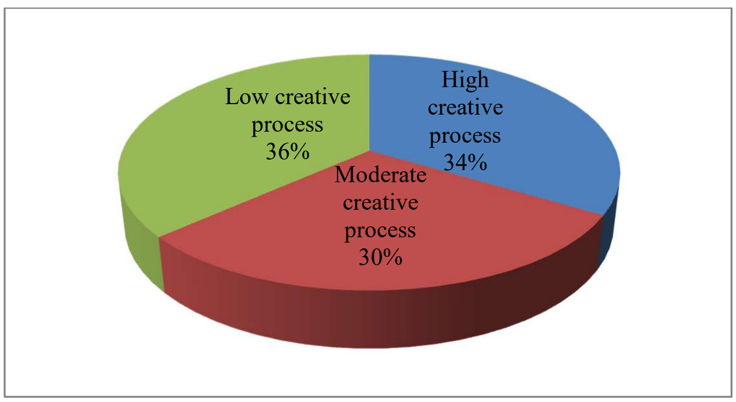

Figure 4: Level of Creative Process of Middle School Students

And then, to investigate the causes of being low correlated, Crosstabulation of mathematical intelligence and creative process were calculated.

Table 11: The Result of Crosstabulation by Level of Mathematical intelligence *Level of Creative Process

		Creative Process			Total
		High	**Middle**	**Low**	
Mathematic Intelligence	**High**	77	82	**94**	253
	Middle	99	59	85	243
	Low	**94**	68	146	308
Total		**270**	**209**	**325**	**804**

The results showed that students who had low mathematical intelligence were high creative and students who had high logical-mathematical intelligence were low creative. By these results, there was low correlation between these two concepts. This finding was conformable to authors such as Barron (2003), Guilford (1950) or Wallach & Kogan (1965) who suggested that scoring high on intelligence tests might demonstrate no signs of creativity where as individuals performing poorly in intelligence tests may sometimes create something very original.

Qualitative Study

According to the result of table 11, as the quantitative survey results showed that students who had low mathematical intelligence were found to be high creative whereas students who had high logical-mathematical intelligence were low creative. The results of qualitative study was conducted by interview with the participants in order to ensure the background ability of mathematics and creativity concepts. In this study, 19 students who had these conditions were chosen to collect the interview results. They were 8 students who had high logical-mathematical intelligence with low creative process and 11 students who had low mathematical intelligence with high creative process. The participants in this interview study were classified into eight categories according to their responses: the students of high groups who were interested in Mathematics and who were not; the students of low groups who were interested in Mathematics and who were not. Similarly, the students of high groups who were interested in creativity and who were not; the students of low groups who were interested in creativity and who were not.

For mathematics intelligence test item, 62.5% of high group and 27.27% of low group were interested in learning mathematics. From these results, most of the students in high group apparently had keen interest in mathematics. For creative process item, 75% of high group and 27.27% of low group were interested in creative process. So, most of the students in high group apparently had keen interest in creative activities.

One student of low intelligence group was not interested in mathematics so also his average score was 41% in test. This response proved in consonance of interview results and survey results. Consider the case of student a:

I don't want to participate in this activity because I'm interested in English.

So, I don't attempt to understand the problems especially in geometry,

I never get good marks in chapter end tests (13 February, 2017).

One student of high intelligence group was interested in mathematics so also his average score was 90% in test. This response also proved in consonance of interview results and survey results. Consider the case of student d:

> *I enjoy to participate in this activity because I'm interested in Mathematics. So, I attempt to understand the problems, I always get good marks in chapter end tests. I like to solve the mathematics problems especially test items 6, 12, 11, 13 and 10 that are experiment, puzzles and cosmic questions* (18 February, 2017).

While the students of high groups who were interested in creativity were high; those of low groups who were interested in creativity were low like as the results of survey. Therefore, these results also support the Barron (2003), Guilford (1950) or Wallach & Kogan's (1965) findings: scoring high on intelligence tests might demonstrate no signs of creativity where as individuals performing poorly in intelligence tests may sometimes create something very original.

And then, most of the students (more than 57%) showed that students who had negative behaviors and characteristics, with no interest in doing

Mathematics weren't enjoyable to participate in taking Mathematical Intelligence Test. And, most of the students (about 75%) showed that positive and desirable behaviors and motivation in creative process but there was no chance to create in real life situations. This study highlights that it is necessary to promote student's divergent thinking which has been lacking in teaching learning situation and create the space for children to learn creatively for creative education to be adopted as an integral part of the schooling experience for a child in Myanmar.

Conclusion

Zelinski (1994) and Maimunah (2004) states that creativity starts with a creative thinking that generates ideas towards solving problems, making improvements, increasing productivity, enhancing effectiveness and adding values. Piaget said that the children at concrete operational stage (10 years age) have been able to understand basic arithmetic, mass, length, transitivity, reversibility and simple mathematical operations (cited in Mok Soon Sang, 2000). In spite of being the middle school students who should have obtained these mathematics skills, the findings clearly point out the weakness of their problem solving abilities. The results of this study seem to be reminding that curriculum of mathematics should be revised and teacher-centered approaches in teaching mathematics should be transformed as soon as possible. In other words, it may be the result of over emphasis on memorization.

The findings of this study provide implications for interventions aiming to improve the logical-mathematical intelligence and creativity in education. It is the duty of parents and teachers to provide support for creative development and help the child to understand the divergent thought and to communicate his ideas freely. They should provide conductive experiences and guidance and they should recognize the individual's creative talent. Teachers should also promote or cultivate creativity in the classroom. Teachers can give project to the students related to community problems like domestic violence. It can help in sprouting creativity because of the human touch and hence emotional connection in it. Classroom environment also plays a crucial role in cultivating creativity and confidence in students. Teachers can make classroom environment where each student's voice matters a lot. Getting involved with the students in the community is the best way to give push to their creativity.

As indicated through this study, it was restricted to two schools from each district in Yangon Region. In this study, Grade 6 and Grade 7 students were survey. If it is possible, more middle school students from all grade levels should be selected as the sample. This study was limited a cross-sectional design due to scarcity of time and resources. So, a study of longitudinal design is necessary to clarify the students' logical-mathematical intelligence and creative process. Based on the results of this study, many studies should be conducted on other intelligences. If it is possible, it should be expanded on private schools and International schools as those schools have been taught students with the same curriculum but they may apply a variety of approaches, methods, teaching aids and facilities. Since this study was conducted only in Yangon Region, more researches should be done on students' creative process from other regions and states.

In Myanmar, the need to develop creativity in the classroom is in a nascent stage and yet to be emphasized in any major educational policy or planning document. The education in Myanmar is characterized as comprising of dull routines, unmotivated teachers, bored students and rote systems of learning. So, it is very important to be creative learners with high logical-mathematical intelligence. The Myanmar Education System in policy makes no overt recommendations for creativity education to be adopted as an integral part of the schooling experience for a child in Myanmar. Therefore, any such initiative can happen only at an individual level and must stem from an ideology or philosophy that believes in creating the space for children to learn creatively.

Especially, the Myanmar Education System not only encourages the left brain that serves the intellectual but also cultivates the right brain that serves the creativity. Without any motivation, students would lack their creativity to study. Thinking always influenced by creativity and intellectual abilities of a person, when a student is considered to be creative, he has minimum levels of intelligence.

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THE RELATIONSHIP BETWEEN METACOGNITION, SELF-EFFICACY AND PHYSICS ACHIEVEMENT AMONG GRADE 9 STUDENTS

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Abstract

This study investigated the relationship between metacognition, self-efficacy and physics achievement among Grade 9 students. The population of this study consisted of Grade 9 students in Yangon Region. The sample of this study consisted of 400 Grade 9 students from five high schools in Yangon Region. The participants were chosen through random sampling. Descriptive research design was used in this study. Metacognition Awareness Inventory (MAI) and the Survey of Self-Efficacy in Science Courses-Physics (SOSESC-P) were used to measure students' metacognition and self-efficacy. And the test with the scope of course from chapters 6, 7, 8 and 9 in physics textbook prescribed for Grade 9 was constructed to measure students' physics achievement. The data were analyzed using the descriptive statistics, independent sample *t*-test, and multiple regression analysis. The correlation analysis showed that there was a positive interrelationship between physics achievement and self-efficacy. The independent sample *t*-test showed that there were significant differences by gender on physics achievement at 0.01 level and vicarious learning at 0.05 level. Results revealed that there were significant differences in physics achievement among schools at 0.01 level. Regression analysis revealed that knowledge of cognition, mastery experiences and vicarious learning were the important predictors of physics achievement. The results of regression model indicated that 38% of variance in students' physics achievement could be predicted from the combination of metacognition and self-efficacy.

Keywords: Metacognition, Self-Efficacy and Physics Achievement

Introduction

Metacognition describes the processes involved when learners plan, monitor, evaluate and make changes to their own learning behaviors. Metacognitive practices help learners to monitor their own progress and take control of their learning as they read, write and solve problems in the

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classroom. Metacognition has been identified as a key factor in the problem-solving process. In addition, current efforts in education have demanded that more attention be given to the development of problem-solving, critical thinking and decision making skills among students.

One of the most important factors influencing students' metacognition is self-efficacy (Dayere & Aveuman, 2008). Self-efficacy is the extent or strength of one's belief in one's own ability to complete tasks and reach goals. Self-efficacy as a theory to explain human behavior change (Bandura, 1977) has become a focus of education researchers. Self-efficacy is one of the primary dimensions of students' overall science identity and contributes to their persistence in physics (Hazari, Sonnert, Sadler & Shanahan, 2010).

Purpose of the Study

1. To determine metacognition and self-efficacy of the Grade 9 students.
2. To investigate whether there are significant differences in metacognition, self-efficacy and physics achievement of Grade 9 students by gender.
3. To investigate whether there are significant differences in metacognition, self-efficacy and physics achievement of Grade 9 students by schools.
4. To investigate whether there is interrelationship among metacognition, self-efficacy and physics achievement among Grade 9 students.
5. To investigate whether metacognition and self-efficacy factors will predict students' physics achievement or not.

Literature Review

Concept of Metacognition

The term metacognition was introduced by Flavell in 1976 to refer to 'the individuals own awareness and consideration of his or her cognitive processes and strategies' (Flavell 1979). Research activity in metacognition began with John Flavell, who is considered to be the "father of the field" and thereafter a considerable amount of empirical and theoretical research dealing with metacognition can be registered. The 'meta' refers to higher-order cognition about cognition or 'thinking about one's thinking'.

Kuhn (2000) claimed that scientific thinking is a form of higher-order thinking that is rooted in metacognition because the awareness of the source of one's knowledge is critical for understanding evidence as distinct from and bearing on scientific theories. Blakey and Spence (1990) suggested thinking about one's own behavior is the first step towards directing that behavior and learning how to learn.

Metacognition in Physics Education and Problem-Solving

Seroglou and Koumaras (2001), through their framework of Physics teaching, argue that Physics education has shifted from the dimension of cognition in the 1960's to that of metacognition in the 1980's. It has been recommended that metacognitive skills should be taught to the students to help them solve Physics problems (Mestre, 2001). Metacognition roles in education include the area of metamemory, language, communication, perception, observation, understanding and problem-solving (Flavell, 1999). Flavell (1976) first defined metacognition as "the active monitoring and consequent regulation and orchestration of these processes in relation to the cognitive objects or data on which they bear, usually in the service of some concrete goal or objective." Kyurshunov (2005) says that use of problem-solving is one of the best ways to involve students in the thinking operations of analysis, synthesis and evaluation.

While there are studies in metacognition and Physics problem-solving, they focus mainly on university students (Heller & Heller, 1995; Henderson et al., 2001; Kuo, 2004). If metacogniton skills appear to be relevant in Physics problem-solving among university students, then it seems likely that metacognitive skills may play a role in aiding secondary school students when solving Physics problems.

Concept of Self-Efficacy

In an effort to provide a theoretical explanation for human behavior change, self-efficacy was firstly introduced by Albert Bandura and defined as "beliefs in one's capabilities to organize and execute courses of action required to produce given attainments" (Bandura, 1977). As Lent and Brown (2006) describe, self-efficacy is not a single characteristic of an individual, rather self-efficacy is a dynamic set of beliefs that are directly related to a particular task or action.

The level of self-efficacy refers to its dependence on the difficultly level of a particular task, such as physics addition problems of one's efficacy judgments across different tasks or activities, such as different academic subjects; strength of efficacy judgments pertains to the certainty with which one can perform a specific task (Zimmerman, 1995). Academic self-efficacy refers to a person's conviction that they can successfully achieve a designated level in a specific academic subject area.

Sources of Self-Efficacy

Successes build a robust belief in one's personal efficacy. Failures undermine it, especially if failures occur before a sense of efficacy is firmly established. According to Bandura's (1997) social cognitive theory, an individual's self-efficacy is derived from interpreting information from four sources: personal mastery experiences, vicarious learning experiences, social persuasion experiences, and physiological state.

Personal mastery experiences, which involve one's accomplishments, are the strongest source of enhancing perceptions of personal efficacy (Bandura, 1997; Schunk, 2002). Experiences with successful completion of a task should have a strong positive influence on an individual's confidence in their ability to complete a similar task. Analogously, repeated failure on a task would negatively influence a person's confidence in their ability to complete the task later (Bandura, 1997).

Vicarious learning experiences occurs when an individual watches others, who are perceived to be similar to the individual, performing a task similar to the one they are considering their own performance on. The observation of the success/failure of others is particularly important when the individual has on personal experience with the task at hand because then they rely primarily on their experiences of watching others perform the task (Bandura, 1997; Zeldin & Pajares, 2000). Modeling is one of the most important ways to promote learning and self-efficacy (Schunk, 1991; Schunk & Hanson, 1985).

Social persuasion is another source of information that adolescents use to shape and form perceptions of personal capability. The beliefs of students' academic capabilities can be firm and improved by the encouragement from parents, teachers and peers. According to Usher and Pajares (2006) positive feedback from significant others is a reliable source of increasing and strengthening the confidence.

Physiological state source of self-efficacy as the somatic information individuals rely on when evaluating capability to perform a task (Bandura, 1997). High levels of stress and anxiety often undermine any confidence in ability (Bandura, 1997). Mood also often influences beliefs in abilities; cheerfulness and a positive attitude will have a positive effect on self-efficacy beliefs. Analogously, depression and sadness will negatively impact self-efficacy beliefs (Zeldin & Pajares, 2000).

Method

Participants

A total of 400 Grade 9 students from five schools in Yangon Region participated in this study. Out of the subjects, 50% (N=200) of subjects were males and 50% (N=200) were females. The participants for the study were selected from five high schools in the Yangon City Development Area. The samples of this study were collected by using random sampling technique.

Instrumentation

The study was conducted with two instruments, Metacognition Awareness Inventory (MAI) and the Survey of Self-efficacy in Science Courses-Physics (SOSESC-P) to know physics achievement through metacognition and self-efficacy. These two instruments were modified into Myanmar version. The first instrument, Metacognitive Awareness Inventory (MAI) was adapted from Metacognitive Awareness Inventory (MAI) designed by Sperling& Howard (2002). It is composed of knowledge of cognition and cognition of regulation. This measure consists of 25 items to assess students' metacognition. The second instrument, Sources of Physics Self-Efficacy Scale was adapted from the Survey of Self-Efficacy in Science Courses-Physics (SOSESC-P) designed by Fencl and Scheel (2005). It is composed mastery experience, vicarious experience, social persuasions and physiological state. This measure consists of 33 items seeking students' physics self-efficacy. Each items were assessed along a 5-point Likert scale ranging from (1) strongly disagree to (5) strongly agree. Then, a well-made physics achievement test was systematically constructed. The test consisted of 29 items which were selected on the basis of item analysis procedure of pilot test. The test was made up of 11 true-false items, 11 completion items and 7 short questions. The items covered the scope of course from chapters 6 to 9 in physics textbook prescribed for Grade 9. For the representative content validation, table of specification was used.

Procedure

First, relevant information was gathered for literature review through the libraries and internet source. Next, the instruments used for the research were prepared under the suggestions of the supervisor and experts in educational psychology. The pilot study was conducted to determine the internal consistency, the validity, the reliability and the clarity of the items of "Metacognitive Awareness Inventory (MAI) Instrument" and "Survey of Self-Efficacy in Science Courses-Physics (SOSESC-P) Instrument". Then, data collection was done after validating the instruments. After getting the required data, they were analyzed step-by-step.

Data Analysis and Findings

In this study, metacognition and self-efficacy of Grade 9 students were examined among the number of students from the selected schools in Yangon Region. In addition, gender difference was further investigated. Then, the relationship between metacognition and self-efficacy with physics achievement of Grade 9 students were found out. And then, the predictors of physics achievement were also examined. Descriptive statistics for students' physics achievement, self-efficacy and metaognition were performed and data were presented in Table 1.

Table 1: Descriptive Statistics for Physics Achievement, Self-Efficacy and Metacognition of Grade 9 Students

	N	**Minimum**	**Maximum**	**Mean**	**Mean Percent**	**Standard Deviation**
Physics Achievement	400	20	46	30.38	60.76%	5.426
Metacognition	400	49	113	90.86	72.69%	9.347
Self-Efficacy	400	65	149	113.17	68.59%	13.317

Based on the descriptive statistics shown in Table 1, the mean percentage of metacognition was generally the highest of all variables among the students. It can be seen that the mean percentage of self-efficacy was the second highest among the students. And the mean percentage of physics achievement was found to be the lowest among the students. And descriptive analysis on subscales of metacognition and self-efficacy was conducted and the data were presented in Table 2 and Table 3.

Table 2: Descriptive Statistics for Subscales of Metacognition of students

	N	**Minimum**	**Maximum**	**Mean**	**Mean Percent**	**Standard Deviation**
Knowledge of Cognition	400	22	56	44.61	74.35%	4.679
Regulation of Cognition	400	27	59	46.24	71.14%	5.466

Based on the results shown in Table 2, the mean percentage of Knowledge of Cognition was generally higher than that of Regulation of Cognition. And descriptive analysis was conducted for subscales of Self-Efficacy and results were presented in Table 3.

Table 3: Descriptive Statistics for Subscales of Self-Efficacy of students

	N	Minimum	Maximum	Mean	Mean Percent	Standard Deviation
Mastery Experiences	400	17	46	31.73	63.46%	4.652
Vicarious Learning	400	15	35	25.53	72.94%	3.520
Social Persuasion	400	13	35	25.96	74.17%	3.562
Physiological State	400	12	44	29.96	66.58%	5.179

Based on the results shown in Table 3, the mean percentage of Social Persuasion was generally the highest of all subscales for enhancing the students' self-efficacy. The mean percentage of Mastery Experiences was found to be the lowest of all subscales for enhancing the students' self-efficacy.

Table 4: Mean Comparison for Physics Achievement and Subscales from Metacognition and Self-Efficacy of Students by Gender

Variables	Gender	N	Mean	Standard Deviation
Physics Achievement	Male	200	28.49	4.667
	Female	200	32.27	5.486
Knowledge of Cognition	Male	200	44.34	5.048
	Female	200	44.89	4.273
Regulation of Cognition	Male	200	45.88	5.856
	Female	200	46.61	5.033
Mastery Experiences	Male	200	31.54	4.993
	Female	200	31.91	4.288
Vicarious Learning	Male	200	25.11	3.892
	Female	200	25.95	3.056
Social Persuasion	Male	200	25.83	3.782
	Female	200	26.09	3.332
Physiological State	Male	200	29.95	5.473
	Female	200	29.97	4.880

According to the descriptive results in Table 4, it was generally seen that gender differences had existed among the Grade 9 students. It was seen that mean scores of female students was higher than that of male students concerning Physics Achievement scores. It meant that female students could make better learning in physics subject than male students. Then, the mean score of female students was higher than that of male students in Knowledge of Cognition. And the mean score of female students was higher than that of male students in Regulation of Cognition. It was also observed that the mean score of female students was higher than that of male students in Mastery Experiences. It was also seen that female students were more Vicarious Learning than male students. And, the female students were more Social Persuasion than male students. The mean score of female students was higher than that of male students in Physiological State.

To find out whether the differences were significant or not, the independent sample *t*- test was applied and the result were presented in Table 5.

Table 5: The Results of Independent Sample *t*-test on Physics Achievement, Self Efficacy and Metacognition of Students by Gender

Variables	**Gender**	**Mean**	***t***	***df***	***p***
Physics Achievement	Male	28.49	-7.412**	398	**.000**
	Female	32.27			
Knowledge of Cognition	Male	44.34	-1.176	398	.240
	Female	44.89			
Regulation of Cognition	Male	45.88	-1.337	398	.182
	Female	46.61			
Mastery Experiences	Male	31.54	-.795	398	.427
	Female	31.91			
Vicarious Learning	Male	25.11	-2.401*	398	**.017**
	Female	25.95			
Social Persuasion	Male	25.83	-.715	398	.475
	Female	26.09			
Physiological State	Male	29.95	-.039	398	.969
	Female	29.97			

** The mean difference is significant at the 0.01 level (2-tailed).

* The mean difference is significant at the 0.05 level (2-tailed).

According to the results of *t*-test, it was confirmed that there was a significant difference between male and female students. It can be concluded that female students performed significantly higher than male students in Physics Achievement (t =-7.412, $p<0.01$). It was suggested that female students could make more concentration in physics learning and better problem-solving and creative thinking in physics problems than male students. And, it was said that significant difference had existed in Vicarious Learning between male students and female students (t = -2.401, $p<0.05$). It was interpreted that female students significantly performed better in Vicarious Learning than male students. It meant that female students could make better imitative learning and modeling than male students. Specifically, it was found that there were no significant differences in Knowledge of Cognition (t = -1.176, $p>0.05$), Regulation of Cognition (t =-1.337, $p>0.05$), Mastery Experiences (t = -.795, $p >0.05$), Social Persuasion (t = -.715, $p>0.05$) and Physiological State (t = -.39, $p>0.05$) by gender.

Table 6: Means and Standard Deviations of Physics Achievement, Metacognition and Self-Efficacy by Schools

	School	**N**	**Mean**	**Standard Deviation**
Physics Achievement	B.E.H.S(2)Dagon	73	26.27	5.146
	B.E.H.S(1)DagonSeikkam	80	27.77	3.697
	B.E.H.S(1)Lanmadaw	77	31.40	6.027
	B.E.H.S(4)Insein	87	32.89	3.795
	B.E.H.S(2)Kungyangone	83	32.92	4.722
Metacognition	B.E.H.S(2)Dagon	73	91.32	9.607
	B.E.H.S(1)DagonSeikkam	80	91.08	10.620
	B.E.H.S(1)Lanmadaw	77	91.84	10.577
	B.E.H.S(4)Insein	87	90.57	8.474
	B.E.H.S(2)Kungyangone	83	89.64	7.328
Self-Efficacy	B.E.H.S(2)Dagon	73	113.60	15.066
	B.E.H.S(1)DagonSeikkam	80	110.94	14.394
	B.E.H.S(1)Lanmadaw	77	114.51	14.306
	B.E.H.S(4)Insein	87	115.46	11.756
	B.E.H.S(2)Kungyangone	83	111.29	10.653

According to the results in Table 6, it was observed that the mean scores of B.E.H.S (2) Kungyangone were greater than that of the remaining schools in Physics Achievement. And, the mean scores of B.E.H.S (1) Lanmadaw were greater than that of the remaining schools in Metacognition. Then, the mean scores of B.E.H.S (4) Insein were greater than that of the remaining schools in Self-Efficacy. To find out the differences in physics achievement, metacognition and self-efficacy among school in Yangon Region, one way analysis of variance (ANOVA) was conducted.

Table 7: ANOVA Results in Differences Among Schools in Yangon Region

		Sum of Squares	***df***	**Mean Square**	**F**	***p***
Physics Achievement	Between Groups	2933.747	4	733.437	32.868	**.000**
	Within Groups	8814.250	395	22.315		
Metacognition	Between Groups	224.306	4	56.076	.640	.635
	Within Groups	34635.854	395	87.686		
Self-Efficacy	Between Groups	1299.694	4	324.924	1.848	.119
	Within Groups	69456.083	395	175.838		

According to ANOVA table, it was found that physics achievement among schools was significantly different at 0.01 level. This meant that physics learning was significantly different among selected schools in Yangon Region. But, it was observed that there were no significant differences in metacognition and self-efficacy among schools at 0.05 level. This means that metacognition and self-efficacy were relatively the same among selected schools in Yangon Region.

To obtain more detailed information on which schools performed better than others, Post- Hoc test was executed by Tukey HSD method.

Table 8: The Results of Tukey HSD Multiple Comparison for Physics Achievement of Grade 9 Students Among Schools in Yangon Region

(I) School	(J) School	Mean Difference (I-J)	Std. Error	*p*
BEHS(2)Dagon	BEHS(1)DagonSeikkam	-1.501	.765	.286
	BEHS(1)Lanmadaw	-5.129**	.772	**.000**
	BEHS(4)Insein	-6.611**	.750	**.000**
	BEHS(2)Kungyangone	-6.642**	.758	**.000**
BEHS(1)DagonSeikkam	BEHS(2)Dagon	1.501	.765	.286
	BEHS(1)Lanmadaw	-3.628**	.754	**.000**
	BEHS(4)Insein	-5.110**	.732	**.000**
	BEHS(2)Kungyangone	-5.141**	.740	**.000**
BEHS(1)Lanmadaw	BEHS(2)Dagon	5.129**	.772	**.000**
	BEHS(1)DagonSeikkam	3.628**	.754	**.000**
	BEHS(4)Insein	-1.482	.739	.265
	BEHS(2)Kungyangone	-1.513	.747	.256
BEHS(4)Insein	BEHS(2)Dagon	6.611**	.750	**.000**
	BEHS(1)DagonSeikkam	5.110**	.732	**.000**
	BEHS(1)Lanmadaw	1.482	.739	.265
	BEHS(2)Kungyangone	-0.31	.725	1.000
BEHS(2)Kungyangone	BEHS(2)Dagon	6.642**	.758	**.000**
	BEHS(1)DagonSeikkam	5.141**	.740	**.000**
	BEHS(1)Lanmadaw	1.513	.747	.256
	BEHS(4)Insein	.031	.725	1.000

Note: **p<.01

The results of Table 8 showed that there was no significant differences in Physics Achievement between B.E.H.S (2) Dagon and B.E.H.S (1) Dagon Seikkam at 0.05 level. This meant that students' physics achievement scores from B.E.H.S (2) Dagon were relatively the same to that of B.E.H.S (1) Dagon Seikkam. Then, it was observed that the students' physics achievement scores from B.E.H.S (2) Dagon were significantly different from that of B.E.H.S (1) Lanmadaw, B.E.H.S (4) Insein and B.E.H.S (2) Kungyangone at 0.01 level. It can be interpreted that students from B.E.H.S (1) Lanmadaw, B.E.H.S (4) Insein and B.E.H.S (2) Kungyangone got higher scores in physics than students from B.E.H.S (2) Dagon.

The students' physics achievement scores from B.E.H.S (1) Dagon Seikkam were significantly different from that of B.E.H.S (1) Lanmadaw, B.E.H.S (4) Insein and B.E.H.S (2) Kungyangone at 0.01 level. It can be predicted that students from B.E.H.S (2) Lanmadaw, B.E.H.S (4) Insein and B.E.H.S (2) Kungyangone got higher scores in physics than students from B.E.H.S (1) Dagon Seikkam.

After the descriptive analysis and mean difference comparison had seen conducted, the relationship among metacognition, self-efficacy and physics achievement was performed in the following Table.

Table 9: Interitemcorrelations of Physics Achievement, Self-Efficacy and Metacognition of Students in Yangon Region

Variables	1	2	3	4	5	6	7
1. Physics Achievement	1	.030 .550	.047 .344	.154** **.002**	.152** **.002**	.069 .170	.117* **.019**
2. Knowledge of Cognition		1	.696** **.000**	.371** **.000**	.412** **.000**	.402** **.000**	.405** **.000**
3. Regulation of Cognition			1	.404** **.000**	.374** **.000**	.453** **.000**	.439** **.000**
4. Mastery Experiences				1	.525** **.000**	.354** **.000**	.528** **.000**
5.Vicarious Learning					1	.473** **.000**	.534** **.000**
6. Social Persuasion						1	.490** **.000**
7. Physiological State							1

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

According to the correlation results in Table 9, the finding showed that there was a positive relationship between Physics Achievement and Mastery Experiences [r = 0.154; p<0.01]. The finding also showed that there was a positive relationship between Physics Achievement and Vicarious Learning [r = 0.152; p<0.01]. And there was a positive relationship between Physics Achievement and Physiological State [r = 0.117; p< 0.05]. Then, there were no relationships among Physics Achievement, Knowledge of Cognition, Regulation of Cognition and Social Persuasion (p>0.05). But all subscales were also positively and significantly with one another. From this result, it can be generally predicted that students with high sense of efficacy in physics could contribute to the high physics achievement scores and also predicted that students with high sense of metacognition in physics could contribute to the high physics achievement. And to determine the predicting factors for physics achievement, simultaneous multiple regression analysis was conducted and the data were presented in Table 10.

Table 10: Simultaneous Multiple Regression Analysis Summary for Metacognition and Self-Efficacy of Grade 9 Students Predicting Physics Achievement (N=400)

Variables	**B**	**β**	***t***	**p**	**R**	**R^2**	**Adjusted R^2**	**F**
Physics Achievement	27.084		9.7**	**.000**	0.619	0.383	0.378	58.241
Knowledge of Cognition	0.158	1.36	2.473*	**0.014**				
Mastery Experiences	0.154	0.132	2.239*	**0.026**				
Vicarious Learning	0.214	1.139	2.309*	**0.021**				

Note: *p<.05

According to the multiple regression analysis results presented in Table 10, the adjusted R Square value was 0.38. The result indicated that 38% of the variance in physics achievement could be predicted from the combination of metacognition and self-efficacy. The model equation to predict the physics achievement from students' metacognition and self-efficacy was;

PA = 27.084 + 0.158KC+ 0.154ME+ 0.214VL
PA= Physics Achievement, KC = Knowledge of Cognition,
ME = Mastery Experiences, VL = Vicarious Learning

It has described that Knowledge of Cognition is the best predicting factor for physics achievement of students in Yangon Region (β=1.36). Again, Vicarious Learning is the second best predictor for physics achievement of students in Yangon Region (β=1.139). Then, Mastery Experiences is the third best predictor for physics achievement of students in Yangon Region (β=0.132). The model was summarized as in Figure 1.

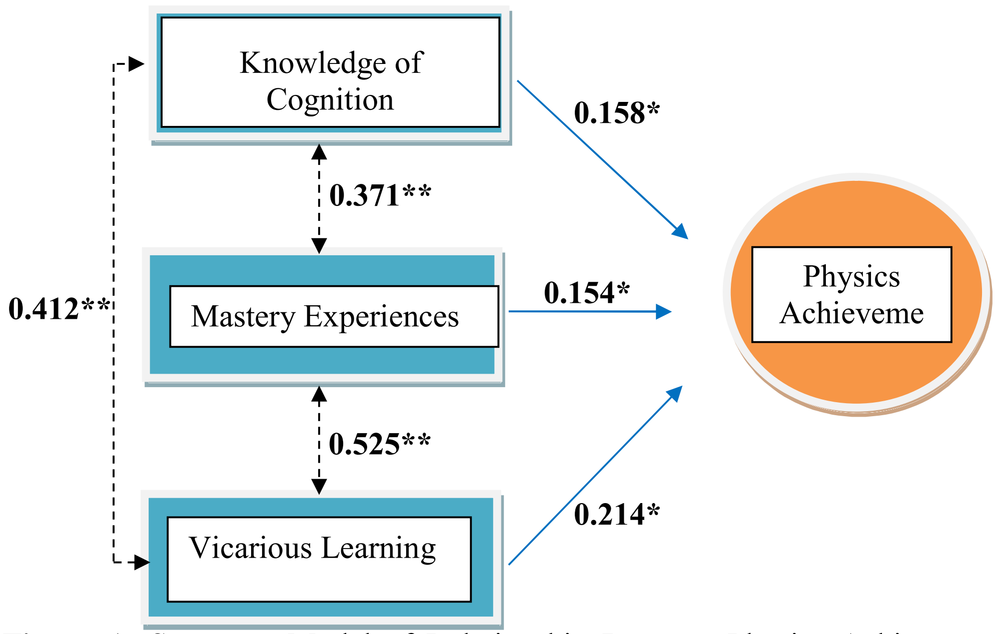

Figure 1: Summary Model of Relationship Between Physics Achievement, Metacognition and Self-Efficacy

Conclusion

The main purpose of this study was to investigate the relationship between metacognition, self-efficacy and physics achievement among Grade 9 students. A survey study was conducted in 2016-2017 academic year with descriptive research design. Descriptive data analyses showed that the mean percent score of the whole sample regarding metacognition, self-efficacy and physics achievement are 73%, 69% and 61%. The result evaluated that students' metacognition, self-efficacy and physics achievement were satisfactory. In this study, the majority of the respondents received the high and moderate mean scores in self-efficacy and metacognition.

The results of *t*-test by gender revealed that there was a significant difference on Physics Achievement between male and female students at the 0.01 level. And then, there was a significant difference in Vicarious Learning between male and female students at the 0.05 level. The result showed that both physics achievement and vicarious learning of female participants were higher than that of male participants.

To find out the significant difference in physics achievement, self-efficacy and metacognition among schools in Yangon region, one way analysis of variance (ANOVA) was done. The result showed that there were significant differences in physics achievement among schools at 0.01 level. And then, there was no significant difference in metacognition and self-efficacy among schools. The results of analysis of multiple comparison for physics achievement showed that there were significant differences between each pair of schools. Students' physics achievement from B.E.H.S (1) Lanmadaw, B.E.H.S (4) Insein and B.E.H.S (2) Kungyangone were significantly different from that of B.E.H.S (2) Dagon and B.E.H. S (1) Dagon Seikkam at the 0.01 level. It meant that students from B.E.H.S (1) Lanmadaw, B.E.H.S (4) Insein and B.E.H.S (2) Kungyangone had higher physics achievement than those from B.E.H.S (2) Dagon and B.E.H.S (1) Dagon Seikkam.

By applying the Pearson Correlation analysis, the results showed that there was a positive significant relationship between physics achievement and students' mastery experiences ($r= 0.154$, $p<0.01$). And then, there was a positive significant relationship between physics achievement and students' vicarious learning ($r= 0.152$, $p<0.01$). Moreover, there was a positive significant relationship between physics achievement and students' physiological state ($r=0.117$, $p<0.05$). But, there were no significant relationship among Physics Achievement, Knowledge of Cognition, Regulation of Cognition and Social Persuasion ($p>0.05$).

Multiple regression analysis was conducted to investigate the best predictors of physics achievement. It has described that Knowledge of Cognition is the best predicting factor for physics achievement of students. Again, Vicarious Learning is the second best predictor for physics achievement of students. Then, Mastery Experiences is the third best predictor for physics achievement of students. The adjusted R square value is .38. This indicates that approximately 38% of the variance in physics achievement was been predicted from the combination of metacognition and self-efficacy. The model equation to predict the physics achievement from students' metacognition and self-efficacy is;

$$\text{Physics Achievement} = 27.084 + 0.158KC + 0.154ME + 0.214VL$$

To summarize the results, the predictor variables concerning Knowledge of Cognition, Mastery Experiences and Vicarious Learning are significantly correlated with students' physics achievement.

Need for Further Research

This research was conducted with metacognition and self-efficacy of students in physics. The further research continues to examine students' metacognition and self-efficacy in other subject areas. This study shows the needs to explore age groups ranging from younger children through older children and individual differences in metacognition and self-efficacy, involving comparisons of better and poor students or students with and without learning disability.

The future research needs to determine the extent of the use of metacognitive strategies in the teaching and learning of physics in the schools. In addition, future research will focus on using teachers' metacognitive instructions in the classroom to identify and assist students in developing their metacognition. Researchers on metacognition and self-efficacy should be extended to all disciplines in universities and colleges. Furthermore, it is also recommended that the research should be conducted to teacher education programs.

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A STUDY OF THE RELATIONSHIP BETWEEN SELF-CONFIDENCE AND PHYSICS ACHIEVEMENT OF GRADE 9 STUDENTS

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Abstract

The main purpose of this study is to explore the relationship between self-confidence and Physics achievement of Grade 9 students. Descriptive survey research method was applied and quantitative data analysis was executed in this study. As the research instruments, Self-Confidence Questionnaires and researcher made Physics achievement test were applied. Self-confidence questionnaires consist of 40 items and researcher made Physics achievement test consists of 25 multiple choice items. A total of 800 Grade 9 students (male=347, female=453) from eight selected high and branch of high schools in Yangon Region were participated in this study. Data from the questionnaires were coded, categorized and analyzed using descriptive statistics, independent sample-*t* test and one way analysis of variance (ANOVA). The results showed that self-confidence was significantly correlated with Physics achievement. In addition, parents' education were positively related with students' self-confidence and Physics achievement. It was found that female students' self-confidence and Physics achievement were higher than male students. As the ANOVA results of this study, students' self-confidence and physics achievement from B.E.H.S (2) Kamayut was the highest among the eight schools and there were significant difference among schools in self-confidence and physics achievement. Again, students' self-confidence and Physics achievement whose parents' education were graduated was higher than that of primary, middle and high.

Keywords: self-confidence, physics achievement

Introduction

Academic achievement plays an important role in the life of an individual. In educational life academic achievement is highly valued. The parents and the teachers expect that the achievement of the students should be the highest. Academic performance can represent a variety of learning outcomes such as knowledge, understanding, attitude, intelligence, skill and application. On the basis of the achievement, the child is graded and evaluated

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as high achiever or low achiever. Good or high academic achievement tends to help both in improving the personality of the students and also their recognition by parents, peer groups, teachers, neighbors and society at large. It boosts their morale and develops feeling in them that they are useful in the family, school and society.

Confidence is the growth hormone for an individual’s personality development. Without confidence, a person’s growth in his life; personal, professional and social remains stunted. If the educational endeavors are to succeed in deriving optimal benefit from the input, the capabilities of pupils need to grow constantly unhampered through the encounter of the individual with his environment. During adolescence, self-confidence is affected by age, race, ethnicity, puberty, health, body height, body weight, body image, involvement in physical activities and gender identity, and awakening or discovery of sexuality. Self-confidence can vary and be observed in a variety of dimensions. An individual's self-confidence can vary in different environments, such as at home or in school.

The achievement of the child depends upon the main factors namely child’s interest, motivation, conceptual learning, understanding in class, adjustment, school environment, home environment and reading interest. It further depends on numerous factors like child interest and motivation in the subject that they study, the devices and methods adopted by teachers in class, family set up, self-confidence and study habits (Bashir &Mattoo, 2012). Students’ academic achievement and their excellence in studies depends mainly on their self-confidence, which is very much influential in their learning process. Therefore, this study is aimed to determine the relationship between self-confidence and Physics achievement in higher secondary students as effective and efficient steps to improve the quality of education has been.

Purpose of the Study

The main purpose of this study is to explore the relationship between self-confidence and Physics achievement of Grade 9 students.

Research Questions

1. Is there any difference in self-confidence and Physics achievement of Grade 9 students by gender, schools, father's education and mother's education?
2. Is there any relationship between self-confidence and Physics achievement of Grade 9 students?

Scope and Procedure

In this study, Grade 9 students' self-confidence and Physics achievement were conducted by survey method. The study was limited to Grade 9 students from eight schools of four districts in Yangon Region. A total of 800 students from eight schools were administered to assess the Grade 9 students' self-confidence and Physics achievement. Self-confidence Questionnaires developed by Liu and Wangs (2005) was used to explore the students' self-confidence and Researcher made Physics Achievement Test was used to measure the students' Physics achievement.

Definition of the Key Terms

Self-Confidence: Self Confidence refers the ability to take appropriate and effective action in any situation (Burton &Platts, 2006).

Physics Achievement: Physics achievement is defined in this study as the scores on the researcher made Physics Achievement Test, designed to measure academic competency in ninth-grade students.

Review of Related Literature

Self-Confidence

Self-confidence is the first requisite to great undertakings (Samuel Johnson, 2005).Self-confidence refers to assuredness in one's own worth, abilities and power, regardless of the situation he is in. Someone who is self-confident has a strong sense of belief and certainty in himself. He exudes calmness, composure and is self-aware. Self-confidence is often linked with possessing of certain knowledge, skill sets or abilities, whether it is acquired or innate. While having aptitude in a particular area can help bolster the self-worth, it is not a necessary prerequisite for self-confidence. Someone with absolutely no competency in something can still be self-confident.

Self- Confidence refers to a person's perceived ability to tackle situations successfully without leaning on others and to have a positive self-evaluation. A self-confident person perceives himself to be socially competent, emotionally mature, intellectually adequate, successful, satisfied, decisive, optimistic, independent, self-reliant, self-assured, forward moving, fairly assertive and having leadership qualities. Adolescence is the period of time when the surge of life reaches its highest peak. Academic achievement during this period can be a stepping stone for the forthcoming year. Adolescents with high academic achievement are considered to achieve their identity in the society, get good career opportunities, develop leadership qualities, and enhance their self-confidence whereas, academic failure leads to frustration, stress, inferiority complex, rejection, increased number of suicides, discouragement and ultimately to dropping out.

The Importance of Physics Achievement

Physics, the study of matter, energy and their interactions, is an international enterprise, which plays a key role in the future progress of humankind. The support of physics education and research in all countries is important because physics is an exciting intellectual adventure that inspires young people and expands the frontiers of one's knowledge about nature. Physics is the most basic of the physical sciences. From chemistry and geology through to biology and cosmology, people understand science in terms of the concepts developed in physics. Not only this, but many of the tools on which the advances of science and technology depend are direct product of physics.

In medicine, X-rays, radioisotope and nuclear magnetic resonance imaging are used. In addition, laser, electron microscopes, synchrotron radiation, and electronics all depend on advances made in physics. Physics has the capability of playing a major role in finding solutions to many of the problems facing the human race. Of course it does not have all the answers but the science is developed enough to have created nuclear weapons which remain a global threat, then surely it can be used for the betterment of all people around the globe. Of course politics, socioeconomic factors and acceptance by the people all play a role in the development of a nation. But physics, engineering and other technological and scientific feats can transform a developing nation to a developed nation.

Physics improves the quality of life by providing the basic understanding necessary for developing new instrumentation and techniques for medical applications, such as computer tomography, magnetic resonance imaging, positron emission tomography, ultrasonic imaging, and laser surgery. Again, Physics is important to man's life because it is used in cooking food, cleaning clothes, watching TV, heating clothes, playing sports and everything else in an individual's life. Therefore Physics achievement is important for students nowadays. Teachers and parents should train and guide children to improve the knowledge about Physics to use the modern materials easily, to solve the problems scientifically, to invent the new things and to serve their country well with modern ideas.

Method

Sample of the Study

By using stratified random sampling technique, eight schools were randomly selected from four districts in Yangon Region. Therefore a total of 800 Grade 9 students (347 males and 453 females) from selected schools were chosen as sample.

Instrumentation

The instruments adapted for data collection were Self-Confidence Questionnaires developed by Liu and Wangs (2005) and researcher made Physics Achievement Test. A total of 40 items were involved in the Self-Confidence Questionnaires to be used in this survey questionnaire. Self-Confidence Questionnaires required the respondents to indicate their level of agreement or disagreement, designated by "Strongly Agree (SA), Agree (A), Undecided (U), Disagree (D) and Strongly Disagree (SD).

To find Physics achievement, researcher made Physics Achievement Test was used. Firstly, chapter 1 to 9 from the Grade 9 Physics textbook were selected to examine students' Physics achievement. Next, a table of specification was drawn according to the level of taxonomy of educational objectives based on the periods allocated for each chapter expressed in Grade 9 Physics Teacher's Manual. Then, 79 multiple choice items were prepared according to the table.

Firstly, Self-Confidence Questionnaires were developed in Myanmar Version and Physics achievement test was conducted at the same time. After preparing the items for each category of Self-Confidence and Physics achievement test, expert review was conducted for face validity and content validity by 11 experts who have special knowledge and close relationship with the field of educational psychology and academic subjects from Yangon University of Education. After the expert validity, items were revised in length and wording. To know reliability, pilot testing was carried out with 70 Grade 9 students in B.E.H.S (1) Thingangyun in the last week of November 2016. After piloting, some items of Self-Confidence Questionnaires were revised. The internal consistency (Cronbach alpha) of Self-Confidence Questionnaire was 0.870 and Physics achievement test was 0.692. For Physics Achievement Test, 25 items were selected according to the values of item difficulty and item discrimination (See Table 3.3) by using the Test Analysis Program. Time allowed was (45) minutes for totally 25 items. For real data collection, the students were administered in the first and second week of December, 2016.

Data Analysis and Results

After developing the instrument, self-confidence and Physics achievement of Grade 9 students were investigated. Moreover, the other influencing factors on the students' self-confidence and Physics achievement such as gender, schools, father's education and mother's education were also explored.

Comparison of Grade 9 Students' Self-Confidence and Physics Achievement by Gender

To investigate whether students' self-confidence and Physics achievement vary with regard to gender, independent sample *t*-test was carried out. From the results of independent sample *t*-test, it may be assumed that male students were lower than female students in their self-confidence and there were statistically significant differences by gender. Again, from the results of independent sample *t*-test, it may be interpreted that male students were lower than female students in their Physics achievement and there were statistically significant differences by gender (See Table 1).

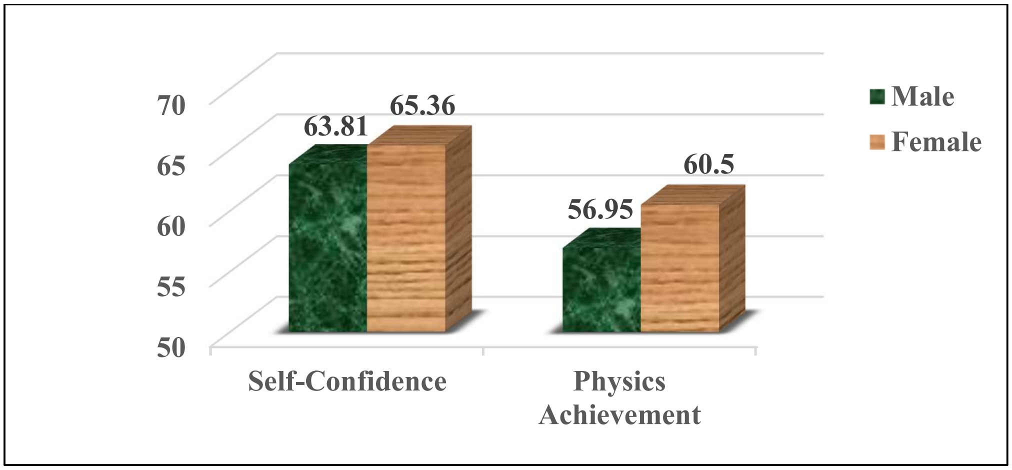

Figure 1: Mean Comparison of Grade 9 Students' Self-Confidence and Physics Achievement

Table 1: Results of Independent Sample *t*-test of Grade 9 Students' Self-Confidence and Physics Achievement by Gender

Variable	Gender	N	Mean	SD	*t*	p
Self-Confidence	Male	347	63.81	8.55	-2.50*	**.013**
	Female	453	65.36	8.80		
Physics Achievement	Male	347	56.95	20.87	-2.55*	**.011**
	Female	453	60.50	18.29		

*The mean difference is significant at the 0.05 level.

Comparison of Grade 9 Students' Self-Confidence by Schools

To explore whether or not there were significant differences in students' self-confidence among schools, one way analysis of variance (ANOVA) was computed. ANOVA results showed that there were significant differences in students' self-confidence among the schools at 0.001 level (See Table 2).

Table 2.ANOVA Results of Grade 9 Students' Self-Confidence by Schools

Variables		Sum of Squares	df	Mean Square	F	p
Self-Confidence	Between Groups	3195.07	7	456.44	6.28***	**.000**
	Within Groups	57536.92	792	72.65		
	Total	60731.99	799			

***The mean difference is significant at the 0.001 level.

To obtain more detailed information of a particular group, Post-Hoc test was executed by Tukey HSD method and it was found that there were significantly different in self-confidence among the schools at 0.05, 0.01 and 0.001 levels (See Table 3).

Table 3: The Results of Tukey HSD for Self-Confidence of Grade 9 Students Among Schools

Variables	School	(J) Schools	Mean Difference	Standard Error	p
Self-Confidence	B.E.H.S (2) Kamayut	Branch of B.E.H.S (3) Mingalardon	6.74***	1.26	.000
		B.E.H.S (2) South Okkalapa	5.05**	1.18	.001
	B.E.H.S (2) Insein	Branch of B.E.H.S (3) Mingalardon	5.93***	1.28	.000
		B.E.H.S (2) South Okkalapa	4.24*	1.21	.011
	Branch of B.E.H.S (3) Mingalardon	B.E.H.S (1) Kyauktan	-5.18**	1.28	.001
		B.E.H.S (2) Thanlyin	-4.75**	1.25	.004
		B.E.H.S (1) Thingangyun	-4.52**	1.25	.008

*The mean difference is significant at the 0.05 level.
**The mean difference is significant at the 0.01 level.
***The mean difference is significant at the 0.001 level.

The results showed that there were significantly different at 0.05, 0.01 and 0.001 levels and that students' self-confidence from B.E.H.S (2) Kamayut and B.E.H.S (2) Insein were higher than that of Branch of B.E.H.S (3) Mingalardon and B.E.H.S (2) South Okkalapa. And then, students' self-confidence from Branch of B.E.H.S (3) Mingalardon was lower than that of B.E.H.S (1) Kyauktan, B.E.H.S (2) Thanlyin and B.E.H.S (1) Thingangyun. Therefore, it can be concluded that socioeconomic status of schools such as situation of the school, facilities supported by the school etc., play a vital role in molding the self-confidence of students at all levels of education.

Comparison of Grade 9 Students' Physics Achievement by Schools

To explore whether or not there were significant differences in students' Physics achievement among schools, one way analysis of variance (ANOVA) was computed. ANOVA results showed that there were significant differences in students' Physics achievement among the schools at 0.001 level (See Table 4).

Table 4: ANOVA Results of Grade 9 Students' Physics Achievement Among Schools

Variables		**Sum of Squares**	**df**	**Mean Square**	**F**	**p**
Physics Achievement	Between Groups	98564.09	7	14080.58	54.27***	**.000**
	Within Groups	205481.91	792	259.45		
	Total	304046.00	799			

***The mean difference is significant at the 0.001 level.

To obtain more detailed information of a particular group, Post-Hoc test was executed by Tukey HSD method and it was found that there were significantly different in Physics achievement among the schools at 0.05 and 0.001 levels (See Table 5).

Table 5: The Results of Tukey HSD for Physics Achievement of Grade 9 Students Among Schools

Variables	School	(J) School	Mean Difference	Standard Error	p
Physics Achievement	B.E.H.S (2) Kamayut	B.E.H.S (1) Thingangyun	14.66***	2.17	.000
		B.E.H.S (2) South Okkalapa	18.91***	2.23	.000
		B.E.H.S (2) Lamataw	26.20***	2.29	.000
		B.E.H.S (2) Thanlyin	30.98***	2.18	.000
		B.E.H.S (1) Kyauktan	26.11***	2.23	.000
		B.E.H.S (2) Insein	15.43***	2.23	.000
		Branch of B.E.H.S (3) Mingalardon	39.22***	2.37	.000
	B.E.H.S (1) Thingangyun	B.E.H.S (2) Lamataw	11.54***	2.29	.000
		B.E.H.S (2) Thanlyin	16.32***	2.17	.000
		B.E.H.S (1) Kyauktan	11.45***	2.22	.000
		Branch of B.E.H.S (3) Mingalardon	24.56***	2.36	.000
	B.E.H.S (2) South Okkalapa	B.E.H.S (2) Lamataw	7.29*	2.34	.040
		B.E.H.S (2) Thanlyin	12.07**	2.23	.000
		B.E.H.S (1) Kyauktan	7.20*	2.28	.035
		Branch of B.E.H.S (3) Mingalardon	20.31***	2.42	.000

Variables	School	(J) School	Mean Difference	Standard Error	p
	B.E.H.S (2) Insein	B.E.H.S (2) Lamataw	10.77***	2.34	.000
		B.E.H.S (2) Thanlyin	15.55***	2.23	.000
		B.E.H.S (1) Kyauktan	10.68***	2.28	.000
		Branch of B.E.H.S (3) Mingalardon	23.79***	2.42	.000
	B.E.H.S (2) Thanlyin	Branch of B.E.H.S (3) Mingalardon	8.24*	2.37	.012
	B.E.H.S (1) Kyaukan	Branch of B.E.H.S (3) Mingalardon	13.11***	2.42	.000
	B.E.H.S (2) Lamataw	Branch of B.E.H.S (3) Mingalardon	13.02***	2.48	.000

*The mean difference is significant at the 0.05 level.
***The mean difference is significant at the 0.001 level.

The results showed that there were significantly different at 0.05 and 0.001 levels and that students' Physics achievement from B.E.H.S (2) Kamayut was higher than B.E.H.S (1) Thingangyun, B.E.H.S (2) South Okkalapa, B.E.H.S (2) Lamataw, B.E.H.S (2) Thanlyin, B.E.H.S (1) Kyauktan, B.E.H.S (2) Insein and Branch of B.E.H.S (3) Mingalardon. And then, students' Physics achievement from B.E.H.S (1) Thingangyun, B.E.H.S (2) South Okkalapa and B.E.H.S (2) Insein were higher than that of B.E.H.S (2) Lamataw, B.E.H.S (2) Thanlyin, B.E.H.S (1) Kyaukanand Branch of B.E.H.S (3) Mingalardon. And then, students' Physics achievement from Branch of B.E.H.S (3) Mingalardon was lower than that of B.E.H.S (2) Thanlyin, B.E.H.S (1) Kyauktan, and B.E.H.S (2) Lamataw.

Comparison of Grade 9 Students' Self-Confidence by Father's Education

To explore whether or not there were significant differences in students' self-confidence among father's education, one way analysis of variance (ANOVA) was computed. ANOVA results showed that there were significant differences in students' self-confidence among the father's education at 0.001 level (See Table 6).

Table 6: ANOVA Results of Grade 9 Students' Self-Confidence Among Father's Education

Variables		Sum of Squares	df	Mean Square	F	p
Self-Confidence	Between Groups	1919.28	3	639.76	8.66***	**.000**
	Within Groups	58812.71	796	73.89		
	Total	60731.99	799			

***The mean difference is significant at the 0.001 level.

To obtain more detailed information of a particular group, Post-Hoc test was executed by Tukey HSD method and it was found that there were significantly different in students' self-confidence among father's education at 0.05, 0.01 and 0.001 levels (See Table 7).

Table 7: The Results of Tukey HSD for Self-Confidence of Grade 9 StudentsAmongFather's Education

Variables	Father's Education	(J) Father's Education	Mean Difference	Standard Error	p
Self-Confidence	Graduated	Primary	4.63**	1.46	**.009**
		Middle	3.64***	.82	**.000**
		High	2.06*	.71	**.020**

*The mean difference is significant at the 0.05 level.
**The mean difference is significant at the 0.01 level.
***The mean difference is significant at the 0.001 level.

According to the Table 7, the students' self-confidence whose father's education was graduated was higher than that of the students' self-confidence whose father's education was primary, middle and high and there were significantly different at 0.05, 0.01 and 0.001 levels.So, it can be assumed that father can train the children how to face the life's difficulties besides academic success encountering in their future life confidently.

Comparison of Grade 9 Students' Physics Achievement by Father's Education

To explore whether or not there were significant differences in students' Physics achievement among father's education, one way analysis of variance (ANOVA) was computed. ANOVA results showed that there were significant differences in students' Physics achievement among the father's education at 0.001 level (See Table 8).

Table 8: ANOVA Results of Students' Physics Achievement Among Father's Education

Variables		**Sum of Squares**	**df**	**Mean Square**	**F**	**p**
Physics Achievement	Between Groups	31630.22	3	10543.41	30.81***	**.000**
	Within Groups	272415.78	796	342.23		
	Total	304046.00	799			

***The mean difference is significant at the 0.001 level.

To obtain more detailed information of a particular group, Post-Hoc test was executed by Tukey HSD method and it was found that there were significantly different in Physics achievement among the father's education at 0.05, 0.01 and 0.001 levels (See Table 9).

Table 9: The Results of Tukey HSD for Physics Achievement of Grade 9 Students Among Father's Education

Variables	Father's Education	(J) Father's Education	Mean Difference	Standard Error	p
Physics Achievement	Graduated	Primary	9.78*	3.14	**.010**
		Middle	16.06***	1.76	**.000**
		High	9.66***	1.53	**.000**
	High	Middle	6.41**	1.80	**.002**

*The mean difference is significant at the 0.05 level.
**The mean difference is significant at the 0.01 level.
***The mean difference is significant at the 0.001 level.

The results showed that there were significantly different at 0.05, 0.01 and 0.001 levels and that students' Physics achievement whose father was graduated was higher than that of students' whose father was primary, middle and high. And then, students' Physics achievement whose father education high was higher than that middle. From the results, it can be shown that father involves an important role in developing students' academic achievement. Since they pass different grades levels, they can guide their children which way is better and more effective for them than others and how to study lessons to get high grades in academic subjects.

Comparison of Grade 9 Students' Self-Confidence by Mother's Education

To explore whether or not there were significant differences in students' self-confidence among mother's education, one way analysis of variance (ANOVA) was computed. ANOVA results showed that there were significant differences in students' Physics achievement among the father's education at 0.001 level (See Table10).

Table 10: ANOVA Results of Grade 9 Students' Self-Confidence Among Mother's Education

Variables		**Sum of Squares**	**df**	**Mean Square**	**F**	**p**
Self-Confidence	Between Groups	1740.29	3	580.10	7.83***	**.000**
	Within Groups	58991.70	796	74.11		
	Total	60731.99	799			

***The mean difference is significant at the 0.001 level.

To obtain more detailed information of a particular group, Post-Hoc test was executed by Tukey HSD method and it was found that there were significantly different in self-confidence among mother's education at 0.05 and 0.001 levels (See Table 11).

Table 11: The Results of Tukey HSD for Self-Confidence of Grade 9 Students Among Mother's Education

Variables	**Mother's Education**	**(J) Mother's Education**	**Mean Difference**	**Standard Error**	**p**
Self-Confidence	Graduated	Primary	5.40***	1.22	**.000**
		Middle	2.32*	.82	**.026**
	High	Primary	3.81*	1.25	**.012**

*The mean difference is significant at the 0.05 level.
***The mean difference is significant at the 0.001 level.

According to the Table 11, the students' self-confidence whose mother's education was graduated was higher than that of the students' self-confidence whose mother's education was primary and middle. And then, the students' self-confidence whose mother's education was high was higher than that of primary and there were significantly different at 0.05, and 0.001 levels.It can be interpreted that mother can nurture the children how to solve the problems for all situation and how to pass difficult times with fully strength and confidence. Therefore, parental support is an essential thing in upgrading the students' self-confidence.

Comparison of Grade 9 Students' Physics Achievement by Mother's Education

To explore whether or not there were significant differences in students' Physics achievement among mother's education, one way analysis of variance (ANOVA) was computed. ANOVA results showed that there were significant differences in students' Physics achievement among the mother's education at 0.001 level (See Table12).

Table 12: ANOVA Results of Grade 9 Students' Physics Achievement Among Mother's Education

Variables		**Sum of Squares**	**df**	**Mean Square**	**F**	**p**
Physics Achievement	Between Groups	26069.49	3	8689.83	24.8***	**.000**
	Within Groups	277976.51	796	349.22		
	Total	304046.00	799			

***The mean difference is significant at the 0.001 level.

To obtain more detailed information of a particular group, Post-Hoc test was executed by Tukey HSD method and it was found that there were significantly different in Physics achievement among the mother's education at 0.001 level (See Table 13).

Table 13: The Results of Tukey HSD for Physics Achievement of Grade 9 Students Among Mother's Education

Variables	**Mother's Education**	**(J) Mother's Education**	**Mean Difference**	**Standard Error**	**p**
Physics Achievement	Graduated	Primary	11.36***	2.64	**.000**
		Middle	13.71***	1.79	**.000**
		High	9.46***	1.57	**.000**

***The mean difference is significant at the 0.001 level.

The results showed that students' Physics achievement whose mother was graduated was higher than that of students' whose mother was primary, middle and high and there were significantly different at 0.001 level. Like fathers, mothers have a responsibility in increasing the academic achievement and monitor their children towards that. Parents are the first teachers of children. So, it is important that the parents especially mothers be knowledgeable about everything including the nature of their children, condition of the education, family income, economic level of country, etc. If mothers are wise and can act, think and nurture their children suitably according to the current situation, it is sure to produce all round developed children for the nation.

The Relationship Between Grade 9 Students' Self-Confidence and Physics Achievement

To explore the relationship between Grade 9 students' self-confidence and Physics achievement, Pearson product-moment correlation coefficients was conducted. The results revealed that students' self-confidence and Physics achievement were positively correlated (See Table 14).Therefore, it can be interpreted that the higher the students' self-confidence, the higher Physics success they become.

Table 14: Correlations Between Self-Confident and Physics Achievement of Grade 9 Students

		Self-Confidence	Physics Achievement
Self-Confidence	Pearson Correlation	1	.254***
	Sign (2-tailed)		.000
	N	800	800

***Correlation is significant at the 0.001 level.

Conclusion

The main purpose of this study was to find out the relationship between self-confidence and Physics achievement of Grade 9 students.In comparing student's self-confidence by gender, the mean score of male students were lower than that of female students. Therefore, it can be assumed that female students were more self-confident in their academic subjects than male students. Moreover, ANOVA results showed that there were significant differences in self-confidence among schools. The results showed that the mean score of students' self-confidence from B.E.H.S (2) Kamayut was the highest and Branch of B.E.H.S (3) Mingalardon was the lowest. Therefore it may be assumed that students from B.E.H.S (2) Kamayut have the highest happiness about their school life and would possess the benefits of being self-confidence such as greater self-worth, freedom from self-doubt, freedom from fear and anxiety, more energy and motivation to act, etc. And then, self-confidence of students whose father and mother's education were graduated was the highest and primary was the lowest.

In comparing students' Physics achievement by gender, the mean score of male students was lower than that of female students. It can be assumed that the female students gain more success in Physics achievement than that of male students. ANOVA results showed that there were significant differences in Physics achievement among schools. The results showed that the mean score of students' Physics achievement from B.E.H.S (2) Kamayut was the highest and Branch of B.E.H.S (3) Mingalardon was the lowest. And then, Physics achievement of students whose father and mother's education were graduated was the highest and middle was the lowest. Therefore, parents' level of education play an important role in becoming high self-confidence and receiving more successful in academic subjects for students.

And then self-confidence and Physics achievement were significantly correlated. This shows that there is a positive relationship between self-confidence and Physics achievement and further indicates that as the students' self-confidence improve their Physics achievement also improve. It means that when there was high in students' self-confidence about their academic subjects, there will also increase in academic achievement of the students. This finding is consistent with the previous research of "A study of Self-Confidence of Adolescents in Relation to their Gender, Locality and Academic Achievement" defined by Fareen Fatma(2015).

Discussion and Recommendation

In particular, education is seen as the means by which goals can be achieved. Therefore, in raising a healthy and talented society, the education system is very essential. Uplifting the education standards of the entire nation is being constructed as a social objective. As the education system had improved, other branches of sources that are necessary to become a modern developed nation will develop. Finally, it will be built the Republic of the Union of Myanmar with new generations. However, to do so, new generations' academic achievement is very important because they are determined on the result of it. And then, the education system relies on the future teachers. Teacher education is believed to be the only hope to make the society better. Teachers are the persons who could make students' self-confidence become high by providing learning opportunity that can promote academic achievement.

The findings of this study showed that self-confidence was positively related with Physics achievement. Therefore, teachers, parents and society should provide guidance for students in the development of self-confidence in themselves by making decisions on one's own and taking responsibility for them. In following these guidelines, students would not only develop self-confidence, but would also take important and necessary steps toward a healthy adult life. Teachers should mold the students as good citizen and make them self-confident to take responsibility on their shoulders for developing their nation. The young generation should be confident to excel in their academic performance and enhance life skills to face the problems in future. Moreover, it is the responsibility of the teachers and the school administrators to create a better learning environment that arouses students' curiosity to achieve higher goals, critical and creative thinking.

Unfortunately, in order to foster positive self-confidence, many educators purchase a wealth of materials that espouse the popular, and misleading, belief that simply telling kids that they are wonderful, terrific, nice, etc. builds self-confidence. Instead of wasting time and time on such ineffective self-confidence building exercises, educators should devote attention to everyday classroom techniques such as the following:

- Demonstrate social support by showing personal interest in every individual student. Granted, elementary teachers have more time for this than most high school teachers, but it still can be done at every grade level.
- Consistently demonstrate respect, acceptance, and care toward all students, regardless of their backgrounds and past or present behavior.

- Avoid social comparisons (e.g., posting of grades). Encourage students to compare their performance (including in behavior) not to that of their peers but to personal goals or previous performance (e.g., instead of saying “Why don’t you act like others in the class?” you should say “Your behavior is much better than last week when you show that you can ignore others when they bother you”).
- Avoid public humiliation. When possible, handle discipline problems privately, and not publicly.
- Garner social support from others, especially parents and peers, to help booster positive emotions and behavior. A two-minute phone call home, informing parents that their child could use some emotional support after experiencing an unexpected failure, is likely to be time well spent.
- To help protect feelings of autonomy, and thus self-confidence, apply only as much external regulation as necessary to bring about compliance. Referred to as the Principle of Minimal Sufficiency, educators should use “just enough” external pressure to bring about compliance without making students feel that they arebeing coerced. When external pressure is not obvious, students tend to believe that they perform a requisite behavior for reasons that are intrinsically motivated, and thus are more likely to engage in that behavior in the future (Dr. Manning, 2003).

These recommendations can be achieved by talking to parents and teachers on the issues raised in a forum like the Parent-Teacher’s-Association. Group counselling can also be organized for students on good study habits, well self-confidence and gender quality. School administrators i.e., the head teachers should forward the needs and problems affecting students study habits to government for intervention.

Suggestion for Future Research

The sample used in this study from seven Basic Education High School and one Branch of Basic Education High School. To make more representative, more Grade 9 students from the other high schools should be participated in the study. In another future research, students should be tested in other subjects such as Myanmar, English, Mathematics and etc. Physics achievement had many dimensions that are differed to schools, teacher trainees and regions. It was suggested that the future researchers should concentrate on this. Self-confidence had also many dimensions such as home, school environment, curriculum, personality, intelligent, a good community, sex, caste, physical and social environment. Therefore, future researchers should also concentrate on these areas. Furthermore, the future researchers should conduct the studies with larger sample size including different Grades from different states and regions to be more generalized, reliable and valid. Demographic variables should be considered in future research. Qualitative research should be studied to investigate deeply about the adjustment and shyness of students. Moreover, longitudinal study should be extended to explore the effectiveness of self-confidence.

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