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AN ANALYTICAL STUDY OF PRINCIPALS' KNOWLEDGE MANAGEMENT PRACTICES FOR REENGINEERING PRIMARY TEACHERS' TEACHING PERFORMANCES*

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Abstract

The objectives of this research are to analyze the principals' knowledge levels and practice levels on knowledge management (KM), to examine the variations of principals' KM practices due to their knowledge levels, personal factors (academic qualification, professional qualification, attended workshop, teaching service, gender), and school related factors (type of school and school location), to analyze primary teachers' levels of teaching performances, to examine the relationship between principals' KM practices and primary teachers' teaching performances, to identify the predictors of principals' KM practices on primary teachers' teaching performances and the predictors of principals' personal factors on their KM practices. Quantitative and qualitative methods were employed in this study. A total of ninety principals and four-hundred and eighty teachers from Yangon City Development Area were selected as subjects, using the equal stratified random sampling. The required data for quantitative study were collected by using three sets of questionnaire (one for principals and two for teachers). Interview, documentation, and observation checklists were used for qualitative study. Descriptive statistics, independent sample *t* Test, one-way ANOVA, Item Percent Correct (IPC), Pearson product moment correlation, and multiple regression analysis were used to analyze the data in the study. The level of principals' overall KM practices was moderately high. There were significant differences in principals' KM practices grouped by their knowledge levels, school location, and gender, types of school, academic qualification, professional training, and attended workshops. There was an association between principals' KM practices and teachers' teaching performances. The multiple regression results showed that among the predictors of principals' KM practices on primary teachers' teaching performances, process management was appeared as the most influential predictor and among the principals' personal factors, attended workshop was appeared as the most influential predictor for principals' KM practices.

Keywords: Knowledge Management, Reengineering

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Introduction

The role of today schools as major disseminators of knowledge cannot be denied for educational reform of a nation. Leung (2010) posits that principals need to understand how they can facilitate teachers to work intelligently and effectively. Fullan (2002) suggests that the principals' practices of KM can be thought as the most effective and appropriate approach to secure durable exceptional performance of teachers. Strong leadership of principals is importantly needed to provide guidance and orientation for enhancing teachers' teaching performances. KM is important for teachers at all levels in the education sector. Out of these levels, the role of primary school teachers is vital because they are prime and essential resources for education reforms, and primary education has the need to be exceptionally established as it lays the foundation for children in their future year after year. Equally, the primary school principals are crucial resources to build a very basic foundation for the development of every nation's education. To equip teachers with knowledge and skills for improving their teaching learning performances can be undoubtedly attained by principals' strong leadership of implementing KM. Therefore, it is necessarily important to examine the principals' KM practices for reengineering primary teachers' teaching performances. Hopefully, the principals' KM practices in this study were not envisioned as provision benefits solely to the researched schools but were intended to provide a reference model for all primary school principals.

Objectives of the Research

The objectives of this study are as follows.

1. To study knowledge levels of principals on knowledge management for reengineering primary teachers' teaching performances
2. To analyze practice levels of principals on knowledge management for reengineering primary teachers' teaching performances perceived by teachers
3. To examine the variations of principals' knowledge management practices in terms of their school related factors, personal factors and knowledge levels
4. To analyze primary teachers' levels of teaching performances

5. To examine the relationship between principals' KM practices and primary teachers' teaching performances
6. To identify the predictors of principals' KM practices on primary teachers' teaching performances
7. To identify the predictors of principals' personal factors on their KM practices

Research Questions

1. What are the levels of principals' knowledge on KM for reengineering primary teachers' teaching performances?
2. What are the levels of principals' KM practices for reengineering primary teachers' teaching performances perceived by teachers?
3. What are the variations of principals' KM practices in terms of their school related factors, personal factors and knowledge levels?
4. What are the levels of primary teachers' teaching performances?
5. Is there any relationship between principals' KM practices and primary teachers' teaching performances?
6. What are the predictors of principals' KM practices on primary teachers' teaching performances?
7. What are the predictors of principals' personal factors on their KM practices?

Theoretical Framework

The framework for this study takes into consideration of people-based management, process-based management and technology-based management for principals' KM practices. Teachers' teaching performances were based on designing the instruction, delivery of the instruction and assessment of the instruction.

People–Based Approach to KM: The main emphasis was placed upon on people, their behavior, their expectations, and their potential to contribute to the success of the KM effort. The characteristics of adult learners can be identified through the careful investigation of adult learning theories and literatures contributed by Knowles' (1980), Grow's (1991), Tough (1971), and Mezirow (2000). Every knowledge manager needs to consider characteristics of individual knowledge workers such as how they best learn, how they prefer to receive information, and how they can be best helped to

put the knowledge to work. The easier it is for a knowledge manager to find, understand, and internalize the characteristics of adult learners, the greater the principals can identify and utilize the learning strengths of individual teachers for instructional improvement efforts.

Process–Based Approach to KM: Dalkir (2005) discussed that the principals' KM activities and knowledge of what needs to be done for teacher growth and school success have a significant impact on the instruction and instructional efforts of the schools. Serving as role models by providing adequate examples of ideal behavior, communicating clearly with all teachers, sharing and using knowledge themselves are better ways to promote KM in the school. This process involves group discussion, interactive instructions, keeping memos, internal meetings, attending seminars and workshops. The principals must focus on four modes of knowledge creation: socialization, externalization, internalization, and combination. As results, these skills can be helpful to discover alternative approaches to doing things, faster way of completing tasks, and easier paths to accomplishing desired results. The principals can also organize a number of formal activities aimed at creating the environment necessary to share and learn. The function of team learning achievements plays a major role in the transfer of individual learning to organizational learning. Another important aspect of KM is a learning organization in which a group of people continually enhancing their capacity to create what they want to create and in which people at all levels, individually and collectively, are continually increasing their capacity to produce results they really care about.

Technology–Based Approach to KM: The principal has to plan what type of technology is necessary for successful implementation of the KM effort. Principals need to possess right knowledge and skills of giving guidelines to teachers to use ICT tools in their teaching learning effectively. According to Egan (2003), the principals should choose the medium of the knowledge sharing system with care. The principals should ensure that the school has an easily understandable structure and categories so that users can have a better knowledge sharing and find what they are looking for easily. Presentations, publications, and libraries are the most obvious forms of dissemination of

knowledge. All KM systems in schools require a certain level technology and infrastructure support to be effective.

The study of teachers' teaching performances has advanced in a holistic approach to teaching practices and takes into consideration of dimensions as follows.

Designing the Instruction: It requires planning a logically organized course that aligns objective/ outcomes, learning experiences (content and delivery), and assessments based on sound principles from the learning subjects (NRC, 1999). The teacher plans using the school's curriculum, effective strategies, resources, and data to meet the needs of all students.

Delivery of the Instruction: The teacher effectively i) engages and maintains students in active learning; ii) builds upon students' existing knowledge and skills; iii) differentiates instruction to meet students' needs; iv) reinforces learning goals consistently throughout the lesson; v) uses a variety of effective instructional strategies and resources; vi) uses instructional technology to enhance student learning; vii) communicates clearly and checks for understanding; viii) arranges the classroom to maximize learning while providing a safe environment; ix) establishes clear expectations, with student input, for classroom rules and procedures early in the school year; and x) enforces them consistently, fairly; xi) maximizes instructional time and minimizes disruptions; xii) establishes a climate of trust and teamwork by being fair, caring, respectful, and enthusiastic; and xiii) respects students' diversity and special needs.

Assessment of the Instruction: It requires that the teacher designs and uses valid, reliable methods of (i) measuring student learning of the established objectives and (ii) providing meaningful feedback to students (James, 2010). The teacher systematically gathers, analyzes, and uses data to measure student progress, guide instruction, and provide timely feedback. A teacher uses pre-assessment data to develop expectations for students and to document learning, creates or selects valid and appropriate assessments, aligns student assessment with established curriculum standards and benchmarks, uses a variety of formal and informal assessment strategies to guide instruction, uses assessment tools for both formative and summative purposes and gives constructive and frequent feedback to students on their learning.

Definition of Key Terms

Knowledge Management: KM is defined as 'the systematic process of acquiring, organizing, and communicating the knowledge of organizational members so that others can make use of it to be more efficient and productive (Alavi & Leidner, 2001).

Reengineering: Reengineering an organization is simply the process of reviewing all the different levels of an organization's way of doing work and considering how to improve things (Liberman and Pointer Mace, 2008).

Operational Definition

Knowledge Management is the formulation of the processes so as to establish an environment to foster teachers to create, share, learn and use knowledge together for the organizational advantages.

Research Method

Both quantitative and qualitative research methods were employed.

(i) Sample: For quantitative study, the sample comprised 90 schools in total including 67 Basic Education Primary Schools and 23 Basic Education Post-Primary Schools from downtown, inner suburban and outer suburban in Yangon City Development Area (YCDA). As using the equal stratified random sampling method, 30% of principals and 160 teachers (33.33%) from each of the location- 90 principals and 480 teachers in total were selected as subjects. Purposive sampling method is used to choose the participant principals and teachers for qualitative study. Among the selected schools, 4 schools from (Group I), the group with the highest mean scores, and 4 schools from (Group II), the group with the lowest mean. Therefore, 8 principals, and 2 teachers from each school, sixteen teachers in total were interviewed to know and observe the actual situations of those principals' KM practices.

(ii) Instrument: Questionnaire for "principals' knowledge on KM" was based on people management (item 1-23), process management (item 24-41), and technology (item 42-48, measured by two types, true-false item and multiple-choice item scoring 1-mark for one true item and 0-mark for one false item on

48-item-questionnaire. The Questionnaire for Principals' KM Practices was operationally defined to observe a principal in action judging the extent of their practices in KM on a four-point Likert scale ranging from 1 to 4 (1=never, 2=sometimes, 3=often and 4=always). In every case, the four points on the scale are defined in the same way. There were 36 items focused on three components - items of 1-12 were for the area of "people management", items of 13-28 were for the area of "process management", and items of 29-36 were for the area of "technology". The internal consistency (α) of the whole scale of the questionnaire for the principals' knowledge of KM was 0.92, and for the principals' KM practices was 0.85. Interview and documentation were used in qualitative study. Questionnaire for Teachers' Teaching Performances might be operationally defined by observing a teacher in action judging the extent of their performances in teaching based on a four-point Likert scale ranging from 1 to 4 (1=never, 2=sometimes, 3=often and 4=always). In every case, the four points on the scale are defined in the same way. There were 31 items focused on three components such as "designing the instruction, delivery of the instruction and assessment of the instruction" with specific indicators to analyze the extent of primary teachers' teaching performances. Among them, items of 1-8 were related to the area of "designing the instruction", items of 9-26 were related to the area of "delivery of the instruction", and items of 27-31 were related to the area of "assessment of the instruction". The internal consistency (α) of the whole scale of the questionnaire for the teachers' teaching performances was 0.93.

(iii) Procedure: The researcher thoroughly reviewed related literature and received some pieces of advice and guidance for the questionnaires from the panel of experienced teachers. The use of words and content of items were modified. Discussion the modified ones with those experts was also conducted. With the permission from the Deputy Director General (Education) of Yangon Region, the questionnaires were delivered to the respondents between 11th July 2017 and 30th July 2017. All questionnaires were collected after two weeks and were completely answered. Interviews were conducted with selected principals and teachers to obtain much accurate information of principals' KM practices from November, 2017 to January, 2018.

(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: Number and Percentages of Participant Principals Showing the Levels of Knowledge on People Management (N=90)

Variable	No. of Principals (%)	Remark
People Management	6 (6.7%)	Above Satisfactory level-Group A
	70 (77.8%)	Satisfactory level-Group B
	14 (15.5%)	Below Satisfactory level- Group C

Scoring range: > (*M*+1SD) = above satisfactory level, (*M*-1SD)-(*M*+1SD) = satisfactory level, < (*M*-1SD) =below satisfactory level

Table 2: Number and Percentages of Participant Principals Showing the Levels of Knowledge on Process Management (N=90)

Variable	No. of Principals (%)	Remark
Process Management	8 (8.9%)	Above Satisfactory level
	77 (85.5%)	Satisfactory level
	5 (5.6%)	Below Satisfactory level

Scoring range: > (*M*+1SD) = above satisfactory level, (*M*-1SD)-(*M*+1SD) = satisfactory level, < (*M*-1SD) =below satisfactory level

Table 3: Number and Percentages of Participant Principals Showing the Levels of Knowledge on Technology (N=90)

Variable	No. of Principals (%)	Remark
Technology	14 (15.6%)	Above Satisfactory level
	66 (73.3%)	Satisfactory level
	10 (11.1%)	Below Satisfactory level

Scoring range: > (*M*+1SD) = above satisfactory level, (*M*-1SD)-(*M*+1SD) = satisfactory level, < (*M*-1SD) =below satisfactory level

Table 4: Number and Percentages of Participant Principals Showing Levels of Knowledge on Overall Knowledge Management (N=90)

Variable	No. of Principals (%)	Remark
Overall Knowledge Management	8 (9%)	Above Satisfactory level
	68 (75.5%)	Satisfactory level
	14 (15.5%)	Below Satisfactory level

Scoring range: $>$(*M*+1SD) = above satisfactory level, (*M*-1SD)-(*M*+1SD) = satisfactory level, $<$ (*M*-1SD) =below satisfactory level

Table 5: Mean Values and Standard Deviations of Principals' KM Practices Perceived by Teachers (N=480)

Variables	Mean	SD	Remark
People Management	2.81	0.81	Moderately high
Process Management	2.75	0.77	Moderately high
Technology	2.41	0.69	Satisfactory
Overall KM Practices	2.70	0.73	Moderately high

Scoring range: 1.00-1.75= Low, 1.76-2.50=Satisfactory, 2.51-3.25= Moderately high 3.26-4.00= High

Table 6: ANOVA Results of Principals' KM Practices Perceived by Teachers

Variables	Group	Mean	SD	*F*	*P*
Knowledge Levels	Group A	3.09	0.72	25.223	.000***
	Group B	2.69	0.73		
	Group C	2.31	0.52		
School Location	Outer Suburban	2.46	0.73	14.401	.000***
	Inner Suburban	2.78	0.73		
	Downtown	2.86	0.68		
Teaching Service	less than 3 years	2.27	0.51	26.125	.000***
	4 - 6 years	2.62	0.58		
	7 - 18 years	2.99	0.77		
	19 – 30 years	2.46	0.59		
	31 years and above	2.18	0.48		

Variables	Group	Mean	SD	*F*	*P*
Professional Training	BEd	3.87	.18	93.130	.000***
	JTTC	2.54	.62		
	PTTC	2.34	.61		
	DTEC/ PPTT	2.58	.08		
Refresher Courses/ Attended Workshops	None	1.99	.283	116.591	.000***
	CCA	1.86	.101		
	KG	3.13	.504		
	Grade 1	2.78	.189		
	Any Two	3.09	.628		
	All	3.55	.354		

*p<.05, **p<.01,*** p <.001

According to Table 6, it was found that there was significant difference in overall knowledge management practices depending on their knowledge levels, school location, teaching service, professional training, and refresher courses/attended workshops. In Table 6, Group A is above satisfactory level of knowledge, Group B is satisfactory level of knowledge, and Group C is below satisfactory level of knowledge.

Table 7: Results of Independent Samples *t* Test for Principals' KM Practices Perceived by Teachers

Dependent Variable- Overall Knowledge Management Practices

Independent Variables	Group	Mean	SD	*t*	*df*	*P*
Qualification	BA /BSc	2.52	.62	-16.413	478	.000***
	BEd	3.78	.32			
Type of School	Post-primary school	3.53	0.62	13.669	478	.000***
	Primary school	2.52	0.62			

*p<.05, **p<.01,*** p <.001

In Table 7, there was significant difference in overall KM practices depending on their qualification and type of School.

Table 8: Means and Standard Deviations, and Levels of Primary Teachers' Teaching Performances (N=480)

Variables	Mean	SD	Level
Designing the instruction	2.57	.80	Moderately high
Delivery of the instruction	2.56	.70	Moderately high
Assessment of the instruction	2.57	.82	Moderately high
Overall Teaching Performances	2.57	.72	Moderately high

Scoring range: 1.00-1.75=low, 1.76-2.50=satisfactory, 2.51-3.25=moderately high,3.26-4.00= high

Table 9: Correlation between Principals' KM Practices and Primary Teachers' Teaching Performances

Two Groups	KM Practices	Teaching Performances
KM Practices	1	.918**
Teaching Performances	.918**	1

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

According to Table 9, there is an association between principals' KM practices and primary teachers' teaching performances ($r = .918$, $p < .01$).

Potential Factors of KM Practices Affecting Teachers' Teaching Performances

To investigate predictors of KM practices for reengineering primary teachers' teaching performances, simultaneous multiple regressions was conducted through predictors: people management; process management and technology. When the combination of variables to predict primary teachers' teaching performances included people management; process management and technology, (F (3, 476) = 850.56, $p < .001$).

Table 10: (a) Means, Standard Deviations, and Inter-correlations of Primary Teachers' Teaching Performances and Predictors Variables

Variables	Mean	SD	People	Process	Technology
Teaching Performances	2.57	.71			
Predictor Variables					
People Management	2.81	.81	.895**		
Process Management	2.75	.77	.904**	.945**	
Technology	2.41	.70	.779**	.760**	.784**
***p<.001 **p<.01 *p<.05					

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

Again, in Table 10 (b), People management, process management and technology significantly predict primary teachers' teaching performances when all three variables are included. The adjusted R squared value was .84. This indicates 84% of the variance in primary teachers' teaching performances was explained.

Table 10: (b) Simultaneous Multiple Regression Analysis for KM Factors Predicting Primary Teachers' Teaching Performances

Variables	B	Std. Error	Beta
People Management	.312	.050	.353***
Process Management	.412	.055	.441***
Technology	.169	.030	.165***
(Constant)	.148	.050	
R^2= .84; F (3, 476) = 850.56	***p<.001	**p<.01	*p<.05

According to the beta weight, out of three variables, 'Process management' appears to be most striking.

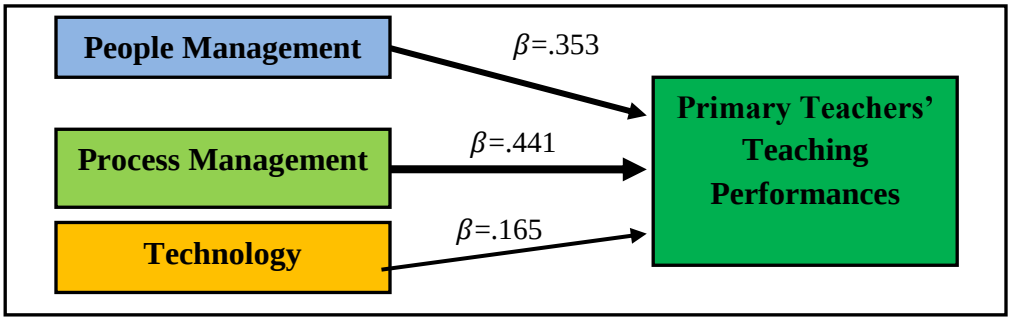

Figure 1: Potential KM Factors Affecting Primary Teachers' Teaching Performances

→ Predicting on Primary Teachers' Teaching Performances (Statistically significant)

Four variables were identified as predictors of demographic data for principals' KM practices as academic qualification (Q), professional Training (T), refresher courses or workshop (W), and teaching service (TS). The mean values, standard deviations, and inter correlations were described in Table 11 (a).

Table 11: (a) Means, Standard Deviations, and Inter-correlations of Principals' KM Practices and Predictors Variables

Variables	Mean	SD	Q	T	W	TS
KMP	2.70	.73	.458***	.431***	.529***	.092*
Qualification	2.31	.68		.557***	.301***	.181***
Training	1.94	.45			.259***	.191***
Workshop	2.20	1.82				.158
Teaching Service	11.19	5.89				

***p<.001 **p<.01 *p<.05

When the combination of variables to predict primary teachers' teaching performances included academic qualification (Q), professional Training (T), refresher courses or workshop (W), and teaching service (TS), (F (6, 473) = 106.53, p <.001). They significantly predict principals' KM practices when all four variables are included. The adjusted R squared value was .57. This indicates that 57% of the variance in principals' KM practices was explained.

Table 11: (b) Simultaneous Multiple Regression Analysis for Principals' Demographic Data Predicting Principals' KM Practices

Variables	B	Std. Error	Beta
Qualification	.221	.042	.227***
Training	.303	.063	.207***
Workshop	.151	.014	.416***
Teaching Service	.006	.004	.054*

R^2= .57; F (6, 473) = 106.5 ***p<.001 **p<.01 *p<.05

According to the beta weight, out of three variables, effects of workshop were most striking. Effects of Teaching Service appeared as less striking for principals' KM practices.

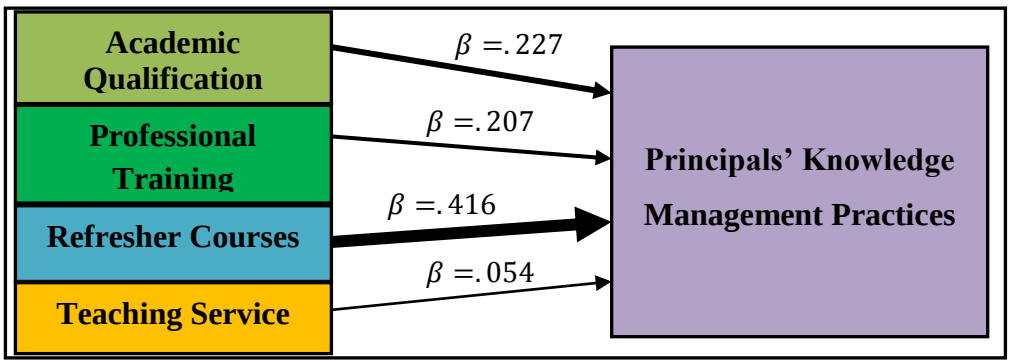

Figure 2: Potential Factors Affecting Principals' Knowledge Management Practices

→ Predicting on Principals' Knowledge Management Practices (Statistically significant)

Based on the KM practices in their schools for reengineering primary teachers' teaching performances, principals gave the following responses.

- Although they want to implement KM activities for teachers on the school schedule and maintain it to its completion, because of too much workload, they do not have much time to focus on it. (n=6, 75%)

- They have financial problems for providing teachers with teaching learning materials such as books and video lessons in order to improve content and pedagogical knowledge of the subject they teach. (n=6, 75%)
- They find it difficult to change teachers' attitude towards appreciating KM activities because teachers still do not know the importance of knowledge sharing activities and have resistance to such activities. (n=5, 62.5%)
- Because of their encouragement, teachers actively join professional development courses or refresher courses related to their teaching subject, however, they do not have enough time to share what they gained from those courses as the explicit forms. (n=2, 25%)
- Since most of the knowledge development programs were conducted at township level, the distance to travel was a problem for teachers to participate in these programs. (n=2, 25%)
- They also find it difficult to save time to carry out KM activities because they were sometimes very busy with other school related affairs (attending a whole day meetings). (n=4, 50%)
- Principals think it is better for them if school-based knowledge sharing trainings are arranged in their locals so that all teachers and principals from nearby schools can join without giving much time. (n=6, 75%)
- Principals also think it is better for them if schools are provided with a separate fund for supporting teachers with books and teaching - learning materials. On the other hand, principals think that they want to request their township education officers to provide them with books and materials necessary for teachers' teaching and learning. (n=6, 75%)
- Principals want their schools to be provided with a good library for teachers and students. For improving their teaching and learning, principals believed that having a reliable school library is importantly needed. (n=4, 50%)
- Principals want their schools to have a room facilitated with what it needs for teachers to conduct knowledge sharing. (n=6, 75%)

- Principals responded that they themselves still need to possess the ability to run knowledge sharing activities in their schools, therefore they want to experience with many opportunities as attending trainings of knowledge sharing activities. (n=6, 75%)

According to the qualitative findings, Group I principals encouraged their teachers to share what they had learned with their colleagues individually and in groups. They assigned teachers to lead their learning teams in turn and involved as a member in their discussions. They wanted teachers to see them as their colleagues or as a knowledge leader and sometimes as a knowledge provider who can share knowledge and skills with them. However, Group II principals could not focus the activities of knowledge sharing. They could not assign their teachers to participate in learning teams and could not lead the role of a knowledge leader and sometimes as a knowledge provider. Teachers from Group I principals really satisfied their principals' KM practices while those from Group II were not satisfied with their principals' management practices for improving their teaching and learning. Principals and teachers in primary schools frequently revealed that they did not have enough number of teachers and faced with burdens of teaching many subjects; they seem to ignore most KM activities in their school although KM needs to be importantly focused.

Conclusion

Conclusion and Discussion

As regards knowledge levels of overall KM practices for reengineering primary teachers' teaching performances, the principals were found to be with different knowledge levels; eight principals were at above satisfactory level, sixty-eight principals were at satisfactory level and fourteen principals were at below satisfactory level.

According to the responses of teachers, the level of principals' KM practices was found to be as moderately high in the first two categories, people management and process management, and satisfactory in the category of technology. Ranking from people management to technology, principals' practices over people management has been higher points amongst all three categories of KM.

From the investigation into the principals' KM practices grouped by their knowledge level, KM practices of Group A principals at above satisfactory level of knowledge and that of Group B principals at satisfactory level of knowledge were found to be often practiced, and that of Group C principals at the below satisfactory level of knowledge were found to be sometimes practiced respectively. Principals with high knowledge level were found to be more performable than those with low knowledge level. Interview results also gave Group A principals could highly focus on KM practices.

As the results from the investigation into the principals' KM practices grouped by their school location, KM practices of principals from downtown and inner suburban schools were found as often practiced and that of principals from outer suburban schools were found as sometimes practiced in the overall KM practices. For each dimension, practices of downtown and inner suburban schools principals were better than that of outer suburban school principals. As the results of their type of school, post-primary school principals' KM practices were perceived as always practiced and that of primary school principals was perceived as often practiced not only in the overall KM practices but also in each of three dimensions.

As the results from the investigation into the principals' KM practices grouped by their teaching service, KM practices of two groups of principals with teaching service of four to six years and seven to eighteen years were perceived as often practiced, and that of the other three groups with teaching service of less than three years, nineteen to thirty years and thirty one years and above were perceived as sometimes practiced in the overall KM practices. For each dimension of KM, the groups with teaching service of seven to eighteen years and four to six years could perform most, the groups with teaching service of nineteen to thirty years, less than three years or thirty-one years and above could perform low in people management. The results in process management and technology was found as the same as that of people management.

As the results of examining principals' KM practices grouped by the academic qualification showed that KM practices of principals who hold BEd were perceived as always practiced and that of principals who hold bachelor degree of Arts or Science were perceived as often practiced in the overall KM practices. There were significant differences in these two groups with

different academic qualification. Principals who hold BEd were seen more performable than principals who hold bachelor degree of Arts or Science in overall practices of KM.

As the results of the principals' KM practices grouped by their professional training, for the overall KM practices, that of principals completed BEd were perceived as always practiced, that of principals completed JTTC or DTEC/PPTT were perceived as often practiced respectively. However, that of principals completed PTTC was perceived as sometimes practiced. Practices of each group in the overall KM practices came to the conclusion that the group with a professional training, BEd, was the most performable among the groups.

As the results of the principals' KM practices grouped by their attended the refresher courses, the practices of principals attended all refresher courses for primary schools were perceived as always practiced, that of principals attended any two of refresher courses or KG or Grade 1 were perceived as often practiced, and that of principals completed CCA or no refresher courses were perceived as sometimes practiced respectively. The outcomes of KM practices of principals of these groups in the overall KM practices came to the conclusion that the group with all refresher courses was the most performable than the other groups.

As the results of analyzing the extent of the sampled teachers' teaching performances based on their responses, the level of teachers' teaching performances was found to be moderately high in each of three categories of teaching performances such as lesson preparation, lesson implementation and lesson evaluation respectively. Accordingly, the level of teachers in the overall teaching performances was found to be moderately high.

As the result of finding the relationship between principals' KM practices for reengineering primary teachers' teaching performances and primary teachers' teaching performances, it was found that there was a relationship between these two variables at ($r = .918$, $p < .01$).

The results of finding the potential factors of principals' KM practices affecting teachers' teaching performances appeared that principals' KM practices were significantly predicted by people management, process management, and technology when all three variables were included. Among

these variables, the study found that process management was the most striking or potential factor.

The results of finding the potential factors of principals' personal factors affecting principals' KM practices appeared that principals' KM practices were significantly predicted by academic qualification, professional training, Teaching service, and refresher courses when all four variables were included. Among these variables, the study found that refresher courses or attended workshop was the most striking or potential factor.

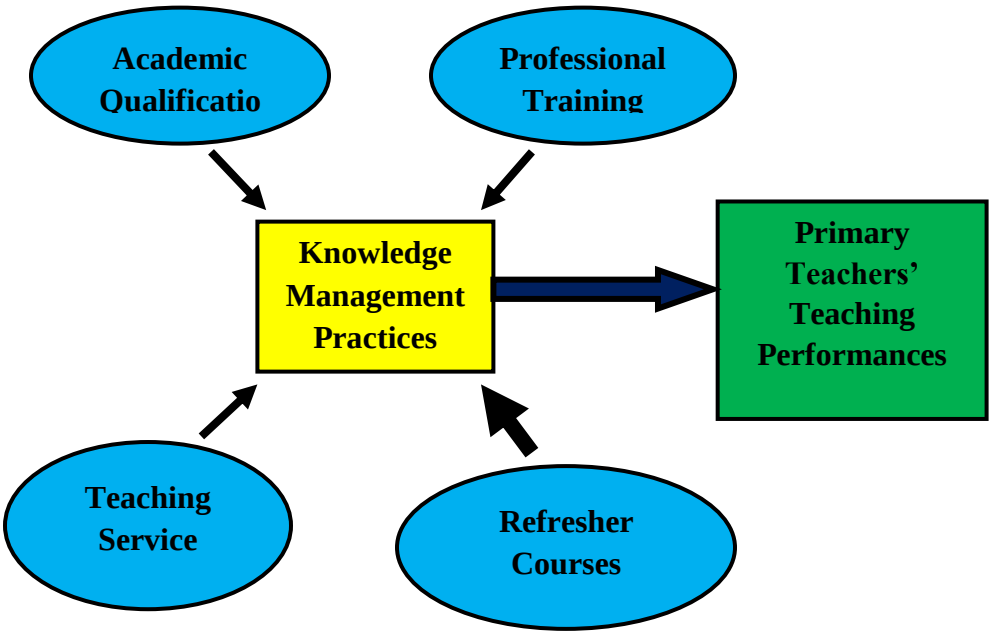

Figure 3: Proposed Knowledge Management Model for Reengineering Primary Teachers' Teaching Performances

→ Predicting on Principals' Knowledge Management Practices (Statistically significant)

⇒ Predicting on Primary Teachers' Teaching Performances (Statistically significant)

Suggestions

The pace of change is escalating in our society due to the explosion of knowledge. Schooling for today society does require restructuring and re-culturing of all schools especially primary schools. For primary school principals to be able to act as knowledge managers, the Ministry of Education necessarily leads to the following ways.

- Needs assessment is necessarily to be done for all primary schools to determine whether they have right teacher resources or not, to run all school activities including teachers' knowledge sharing.
- Every primary school is importantly to have the supporting places where principals and teachers can collaboratively learn and work together for the school goal, try new things of teaching-learning, work in groups, and discuss methods of teaching, and reflect their teaching lessons.
- Provision of equal school facilities to every primary school is necessarily to be emphasized. Regardless of school location, having enough and equal facilities can motivate principals and teachers to try for better teaching and learning.
- Principals need to be financially supported to set up a library with a separate room since a school library is importantly necessary for building habits of reading that is crucial to make our nation be a human resource country.
- Funds for every primary school are necessary to be raised to spend on introduction of knowledge sharing activities in schools and carrying them out well.
- Primary school principals are necessarily to be provided with the opportunities of learning knowledge and skills from education experts for dealing with managing knowledge of teachers so that they find it easy to build a school environment where teachers have trust, ethical behavior, mutual respect, support, and open communication about individual teachers' teaching roles, and contribution as professional members to the society.

- It is also certainly important for the school principals to conceptualize how to create a learning culture for their teachers to have a deep understanding on KM and complete involvement in it.
- It is necessarily important for the school principals to possess the power of role models as teachers will find them as resource person in receiving knowledge and appreciate their principal's enthusiasm in kicking off KM initiatives.
- Focusing on keeping records or documents of teachers' knowledge sharing is necessarily considered for the school so that teachers can easily access the data or information.
- Schools are necessarily to have satisfaction with IT support for KM implementation.
- School principals' ability of conducting KM is necessarily to be improved with education and experience significantly associated with conducting KM.
- Creating professional development programs are helpful for principals to encourage their teachers to participate in a culture of collaboration.
- It is necessarily important for the school principals to be provided with the opportunities of attending workshops that can enhance their knowledge and skills to put more emphasis on conducting activities of knowledge creation and knowledge sharing.

Need for Further Research

Investigation into skills and competencies of principals to be able to implement KM in their schools will need to be conducted as a further research. Additionally, examining of KM practices of middle and high school principals and the barriers of the principals to launch KM in their schools will need to be for the further research. The study analyzed primary teachers' teaching performances based on the overall subjects, not on a specific subject matter, thus the further investigations should be led to teachers' teaching performances in different teaching areas. Another important topic for further research that every school has to work with is the change in the behavior of teachers. Managing teachers to happen in the behavior towards knowledge

gaining and sharing is quite important. It is necessarily recommended to reveal the barriers for principals to launch KM practices for reengineering teachers' teaching performances.

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A STUDY OF SECONDARY SCHOOL STUDENTS' PERCEPTION ON THE CHARACTERISTICS OF EFFECTIVE TEACHERS AT THE BASIC EDUCATION HIGH SCHOOLS IN SAGAING TOWNSHIP, SAGAING REGION

Thi Thi Khine*

Abstract

This study investigated students' perception on the characteristics of effective teachers at the Basic Education High Schools in Sagaing Township, Sagaing Region. A total of 392 Grade-10 students (male=194, female=198) were selected as participants from three Basic Education High Schools in Sagaing Township, using simple random sampling method. Descriptive research design was used. In questionnaire, it has two main parts: demographic data and 25 items for studying students' perception on the characteristics of effective teachers. The five domains of the Effective Teacher Surveys are Lesson Planning and Preparation, Classroom Environment, Instruction, Professional Responsibility and Personal Characteristics. The students' perception on the characteristics of effective teachers was examined by using the Effective Teacher Surveys (25 items) developed by Hadley (2011) based on Charlotte Danielson's Framework for Teaching. Descriptive Statistics, one way ANOVA and Independent Sample *t*-test were used to analyze the data. Regarding the findings of data, students from school B had the highest mean value ($\bar{X}$=3.05) among three selected Basic Education High Schools. There were significant differences in students' perception on the characteristics of effective teachers grouped by school (df = 2, F = 6.688, p<.001), gender (t = -2.467, p<.05) and subject combination (t= 5.451, p<.001).The results showed that the perception of students from school B was highest among selected three schools; the perception of female students was better than that of male students; and the perception of pure science students was better than that of eco-science students.

Keyword: Effective Teacher

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Introduction

Education plays an important role in building a nation. Its quality depends on the quality of teachers and teachers' effectiveness. Effective teachers tend to be aware of educational goals. Effective teachers must possess the knowledge and skills needed and must be able to use them appropriately in order to achieve such goals.

Teachers can be categorized as effective or ineffective. Different people have different perspective of an effective teacher. Some people define an effective teacher as a person who has a superior command over a particular subject; who has an ability to transfer his or her subject effectively to the students. Others are of the view that can activate students' energy and could make them work in a better way (Mailk, 2013).

The idea of effective teacher for each individual is variable. Students' perceptions, opinions, and experiences about an effective teacher are different. An effective teacher has been considered, sometimes, as a perfectionist, encouraging, approachable and caring, other times as intelligent, enthusiastic, funny, clever, affective and understanding, open, and with a relaxed style while teaching. Strong et al. (2004, cited in Moreno, 2009) stated that teaching is vocational and most effective teachers are passionate about their chosen profession. An effective teacher is always in a constant learning process due to changes in terms of the students' characteristics, the curriculum, the community, and finance among many others.

To be an effective teacher does not only involve a deep content knowledge, but also organizational, management and communication having skills, being able to organize instruction, and providing relevant assessment and fair evaluation. In addition, an effective teacher is responsible to create a warm classroom climate, to promote enthusiasm, motivation and an interactive teacher-student relationship. Also, it implies to be caring and understandable, and above all, to enhance learning.

According to James A. Belasco (1991, cited in Mailk, 2013), effective teachers possess a repertoire of teaching practices known to stimulate students' motivation. They have a variety of activities and teaching techniques to make leaning fun for the students. He/ she plans her lesson based on strategic thoughts that involve the conscious selection and use of tools of

thought from her repertoire. Her skills include making children self-motivated. Effective teachers are themselves at a life-long learning process. They are able to diagnose and use their professional knowledge appropriately to enhance students' learning and to improve their personality in order to make a better society.

This study investigated to the extent that students perceive the characteristics of effective teachers. This study hopes that if the teachers understand the students' preferred characteristics of effective teachers, the teachers will be able to maintain and modify themselves their effective characteristics.

Aims of the Research

The main aim of the research is to investigate the students' perception on the characteristics of effective teachers from selected schools. The specific objectives are as follows:

- To investigate the characteristics of effective teachers based on the students' perception at the BEHS, Sagaing Township.
- To examine the differences of students' perception on the characteristics of effective teachers according to students' personal variables such as gender, subject combination, and school.

Research Questions

- To what extent do students perceive the characteristics of effective teachers?
- Are there any significant differences in the characteristics of effective teachers according to students' personal variables such as gender, subject combination, and school?

Definition of Key Term

Effective Teacher

Anderson (2004) stated that an effective teacher is one who quite consistently achieve goals – be they self-selected or imposed- that are related either directly or indirectly to student learning

Operational Definition
Effective Teacher

Effective teacher is a person who can improve student learning with his/ her professional and personal skills such as lesson planning and preparation, classroom environment, instruction, professional responsibility and personal characteristics.

Theoretical Framework

The single largest factor in improving the educational outcome of a student is the effectiveness of that student's teacher in the classroom and that student's principal in the school. Thus, the priority in a school should be to train, create, and retain a culture of effective teachers and principals. "Effective" is defined as producing a result. Very simply, an effective teacher can produce student learning, growth, and achievement. Wong & Wong (2012) have identified the three characteristics of teachers and school leaders have used these characteristics to show how a teacher can improve student learning. These are:

- They are extremely good classroom managers.
- They know how to teach a lesson for student learning and mastery.
- They have positive expectation for student success.

Robert J .Walker (2008) has studied characteristics of effective teachers for fifteen years and defined "effective" as that these teachers made the most significant impact on their lives. He formulated twelve identifiable personal and professional characteristics of effective teachers that consistently affected students in positive ways.

Barbara C. Hunt (2009) stated that effective teachers consistently achieve goals that focus on desired outcomes for their students. Teacher effectiveness is encompassed in knowledge, attitudes, and performance.

Knowledge

- Teachers have excellent verbal and written communication skills.
- Teachers have thorough knowledge of the subjects they teach and pedagogical methods for teaching those subjects to students.

- Teachers know a variety of pedagogical strategies, and when and with which students these are appropriate and likely to be effective.
- Teachers have a thorough understanding of the linguistic and cultural background of their students, and how best to maximize learning for students with diverse needs and characteristics.
- Teachers know how to organize and manage classroom, using time effectively.
- Teachers know how to assess student learning, both formally and informally, and how to vary instruction for students based on these assessments.
- Teachers know how to select and make resources that are appropriate for student learning activities.
- Teachers understand language development and children developmental stages at the level they teach.

Attitudes

- Teachers respect their students regardless of their background, language, or ethnicity.
- Teachers have high expectations for the learning of all students.
- Teachers view student errors as a window to their thinking that can be used to improve student learning.
- Teachers are reflective about their practice.
- Teachers believe in collaboration with others toward common goals for student learning
- Teachers are receptive to involvement of parents and community members in their classroom.
- Teachers are eager to continue to learn and to improve their practice.
- Teachers are committed to their profession

Performance

- Teachers' classrooms are well organized, providing an environment that fosters an interest in learning.

- Teachers developed classroom rules with students and maintain safe and orderly classroom in which all students are treated fairly and equitably.
- Teachers make effective use of time, both of overall classroom time and the time of individual students.
- Teachers use effective teaching techniques: planning lesson, presenting new material clearly, helping students connect new learning with previous learning, and providing guided and independent practice for new material taught.
- Teachers provide opportunities for students to be actively involved in their own learning.
- Teachers respond to student errors in positive ways that help students understand and learn concept involved.

Methodology

Quantitative method was used in this study.

Population and Sample

The target population was Grade-10 students in Sagaing Township, Sagaing Region. There are twelve (three urban schools and nine rural schools) Basic Education High Schools and total of over 1200 students (over three hundred urban school students and over nine hundred rural school students) in Sagaing Township. Among them one urban school and two rural schools were chosen in this study. In order to obtain representative sample, 392 Grade-10 students were selected as subject from three schools using random sampling method.

Instrumentation

The students' perception on characteristics of effective teachers was examined by using Effective Teacher Surveys (25 items) developed by Hadley (2011) based on Charlotte Danielson's Framework for Teaching. The scales of items in the questionnaire were four point Likert-scales ranging from 1-strongly disagree, 2-disgree, 3-agree and 4-strongly agree.

Procedure

In October 2017, pilot testing was conducted with 32 Grade-10 students from Practicing Basic Education High School of UDNR. The reliability coefficient (Cronbach's alpha) was 0.63. Then, questionnaires were distributed to the 392 students from selected schools to collect the data from 22nd November to 27th November 2017. After that, data were analyzed using the Statistical Package for Social Science (SPSS).

Data Analysis

The collected data were analyzed using descriptive statistics to identify the mean scores for the students' perception on their effective teachers' characteristics. Next, independent sample t-test, one -way ANOVA, and Tukey HSD test were conducted to determine whether there were significant differences for the students' perception on their effective teachers' characteristics according to school, gender, and subject combination.

Findings

According to table 1, the total mean value of students' perception on characteristics of effective teachers for school A, B and C were 2.93, 3.05 and 3.01. The mean value of school B for students' perception on characteristics of effective teachers was greater than that of school A and school C.

Table 1: Total Mean Values and Standard Deviation of Students' Perception on Characteristics of Effective Teachers Grouped by School

School	No. of Students	Mean	SD	Remark
School A	96	2.93	.24	Agree
School B	96	3.05	.21	Agree
School C	200	3.01	.24	Agree

1.00-1.49=strongly disagree 1.50-2.49=disagree 2.50-3.49= agree 3.50-4.00= strongly agree

The mean values of students' perception on characteristics of effective teachers based on five domains; lesson planning and preparation(LPP), classroom environment(CE), instruction(I), professional responsibility(PS)

and personal characteristics(PC) for school A, B and C are showed in table 2. It revealed that personal characteristic was greater than other four domains in all schools.

Table 2: Mean Values and Standard Deviation of Students' Perception on Characteristics of Effective Teachers based on Five Domains Grouped by School

School	N	LPP		CE		I		PR		PC	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
School A	96	2.77	0.35	2.71	0.38	2.92	0.41	2.98	0.41	3.23	0.43
School B	96	2.73	0.37	3.03	0.31	3.07	0.37	3.13	0.36	3.30	0.38
School C	200	2.61	0.39	2.88	0.39	3.09	0.39	3.01	0.45	3.45	0.39

1.00-1.49=strongly disagree 1.50-2.49=disagree 2.50-3.49= agree 3.50-4.00= strongly agree

One-way ANOVA was used to explore differences between characteristics of effective teachers grouped by school. Significant differences were found at lesson planning and preparation (LPP) $p< 0.01$ level, classroom environment (CE) $p< 0.001$ level, instruction (I) $p< 0.01$ level, professional responsibility (PR) $p< 0.05$ level, and personal characteristics (PC) $p<0.01$ level (See table 3).

Table 3: ANOVA Results of Students' Perception on Characteristics of Effective Teachers Grouped by School

Domains		*df*	Sum of Squares	Mean Squares	F	*P*
LPP	Between Groups	2	2.068	1.034	7.214	.001**
	Within Groups	389	55.767	.142		
	Total	391	57.835			
CE	Between Groups	2	4.820	2.410	17.085	.000***
	Within Groups	389	52.653	.135		
	Total	391	57.473			
I	Between Groups	2	1.899	.949	6.181	.002**
	Within Groups	389	59.747	.178		
	Total	391	61.645			
PR	Between Groups	2	1.242	.621	3.483	.032*
	Within Groups	389	69.380	.178		
	Total	391	70.622			

Domains		*df*	Sum of Squares	Mean Squares	F	*P*
PC	Between Groups	2	2.473	1.273	7.568	.001**
	Within Groups	389	63.555	.163		
	Total	391	60.028			
Total Mean	Between Groups	2	.718	.359	6.688	.001**
	Within Groups	389	20.877	.059		
	Total	391	21.595			

*p<.05 **p<.01 ***p<.001

To obtain more information of which particular school had the difference, Post- Hoc test was conducted by Tukey HSD method and it revealed that the mean difference between school A and school B was - .120 and it was significantly difference at p=0.001. And, the mean difference between school A and school C was - .075 and it was significantly difference at p=0.025 (See table 4).

Table 4: Multiple Comparison of Students' Perception on Characteristics of Effective Teachers Grouped by School

(I) School	(J) School	Mean Difference (I-J)	Std. Error	Sig.
School A	School B	-.120*	.033	.001
	School C	-.075*	.029	.025
School B	School A	.120*	.033	.001
	School C	.045	.029	.258
School C	School A	.075*	.029	.025
	School B	-.045	.029	.258

*****The mean difference is significant at 0.05 level.

The mean values of male and female students' perception on characteristics of effective teachers based on five domains are showed in table 5. It revealed that male and female students agreed on their effective teachers characteristics in five domains.

Table 5: Mean Values and Standard Deviation of Students' Perception on Characteristics of Effective Teachers based on Five Domains Grouped by Gender

Domains	Gender	No. of Students	Mean	SD	Remark
LPP	Male	194	2.67	.392	Agree
	Female	198	2.68	.378	Agree
CE	Male	194	2.83	.413	Agree
	Female	198	2.91	.349	Agree
I	Male	194	2.99	.409	Agree
	Female	198	3.09	.379	Agree
PR	Male	194	2.98	.437	Agree
	Female	198	3.08	.384	Agree
PC	Male	194	3.38	.240	Agree
	Female	198	3.36	.227	Agree

1.00-1.49=strongly disagree 1.50-2.49=disagree 2.50-3.49= agree 3.50-4.00= strongly agree

According to table 6, there were significant differences in students' perception on their characteristics of effective teachers. It was found that female students' perception on classroom environment, instruction and professional responsibility were greater than that of male students.

Table 6: Independent Sample *t*-test for Students' Perception on Characteristics of Effective Teachers Grouped by Gender

Domains	Gender	N	Mean	SD	t	df	p	MD
LPP	Male	194	2.67	.392	-0.407	390	.684	-.01582
	Female	198	2.68	.378				
CE	Male	194	2.83	.413	-1.995	376.687	.047*	-.07709
	Female	198	2.91	.349				
I	Male	194	2.99	.409	-2.8	390	.005**	-.11136
	Female	198	3.09	.379				
PR	Male	194	2.98	.437	-2.327	390	.020*	-.09934
	Female	198	3.08	.384				

PC	Male	194	3.38	.240	.305	390	.761	.01267
	Female	198	3.36	.227				
Overall	Male	194	2.97	.240	-2.467	390	.014*	-.05819
	Female	198	3.02	.227				

***p*<.05 ****p*<.01**

The mean values of pure science and eco- science students' perception on characteristics of effective teachers based on five domains; lesson planning and preparation, classroom environment, instruction, professional responsibility and personal characteristics are showed in table 7. It indicated that pure science students and eco- science students agreed on their effective teachers characteristics in all domains.

Table 7: Mean Values and Standard Deviation of Students' Perception on Characteristics of Effective Teachers based on Five Domains Grouped by Subject Combination

Domains	Subject Combination	No. of Students	Mean	SD	Remark
LPP	Pure Science	77	2.688	.395	Agree
	Eco- Science	315	2.671	.382	Agree
CE	Pure Science	77	3.070	.300	Agree
	Eco- Science	315	2.825	.386	Agree
I	Pure Science	77	3.210	.321	Agree
	Eco- Science	315	3.003	.404	Agree
PR	Pure Science	77	3.111	.355	Agree
	Eco- Science	315	3.013	.439	Agree
PC	Pure Science	77	3.470	.339	Agree
	Eco- Science	315	3.347	.423	Agree

1.00-1.49=strongly disagree 1.50-2.49=disagree 2.50-3.49= agree 3.50-4.00= strongly agree

To analyze and evaluate whether students' perception on characteristics of effective teachers depends on subject combination, the independent sample *t-test* was conducted. It was found that there were significant differences in students' perception on characteristics of effective teachers. The pure science students' perceptions on classroom environment,

instruction and personal characteristics were greater than that of eco- science students (See table 8).

Table 8: Independent Sample *t*-test for Students' Perception on Characteristics of Effective Teachers Grouped by Subject Combination

Domains	Subject Combination	N	Mean	SD	*t*	*df*	*p*	MD
LPP	Pure Science	77	2.688	.395	.338	390	.735	.01657
	Eco- Science	315	2.671	.382				
CE	Pure Science	77	3.070	.300	5.199	390	.000***	.24537
	Eco- Science	315	2.825	.386				
I	Pure Science	77	3.210	.321	4.811	140.99	.000***	.20722
	Eco- Science	315	3.003	.404				
PR	Pure Science	77	3.111	.355	1.826	390	.069	.08935
	Eco- Science	315	3.013	.439				
PC	Pure Science	77	3.470	.339	2.377	390	.018*	.12346
	Eco- Science	315	3.347	.423				
Overall	Pure Science	77	3.11	.189	5.451	140.88	.000***	.13819
	Eco- Science	315	2.97	.237				

*p<.05 ***p<.001

Discussion, Recommendation, and Further Research

Discussion and Recommendation

In this study, the perceptions of students on their effective teacher characteristics are satisfactory. The results showed that the perception of students from school B was greatest among students from selected three schools according to table 1. In all schools, the students' perception on their effective teacher characteristics, personal characteristics, was greater than other four domains according to table 2. So teachers in all schools need to exercise better practice in lesson planning and preparation, personal characteristic classroom environment, instruction, and professional responsibility. The perception of female students on classroom environment,

instruction and professional responsibility was better than that of male students according to table 6; and the perception of pure science students on classroom environment, instruction and personal characteristic was better than that of eco-science students according to table 8. It can be said that characteristics of effective teachers varied according to school, gender, and subject- combination.

To be an effective teacher is not an easy task. Effective teachers must possess good professional and personal skills. Content knowledge, good planning, good classroom management and organizing, clear communication, and professional development are essential factors to be effective teacher.

The following recommendations are made for teacher effectiveness and for improving student learning.

- Teacher should have a sound understanding of the standards that define intended student learning.
- Teachers should use their understanding of standards to design appropriate and effective learning.
- Teachers should create attractive classroom that is warm, in which student learning can improve.
- Co-operative learning groups should be formed within the classroom as needed to achieve particular objectives.
- Teachers should reinforce positive behavior, especially with students who have a history of behavioral problems.
- Teachers should prepare students for learning by providing an initial structure to clarify intended outcomes and cue the desired learning strategies.
- Teachers should provide whatever assistance students need to enable them to engage in learning productively.
- Teachers should provide immediate feedback to students concerning the correctness or adequacy of their responses.
- Teachers should praise students to reinforce correct, adequate, and appropriate responses.

Needs for Further Research

This study tried to investigate the students' perceptions on characteristics of effective teachers of Basic Education High Schools at Sagaing Township, Sagaing Region. It is necessary to investigate students' perceptions on characteristics of effective teachers in other States and Regions. In the future, if the research subjects include those from other elementary schools and lower secondary schools, more detailed results will be obtained. Further research for in- depth analysis is needed. In conclusion, it is expected that the useful information and knowledge obtained from this research will contribute to the enthusiastic teachers to become effective teachers.

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INVESTIGATING THE KNOWLEDGE, VALUE AND EFFORT OF TEACHER EDUCATORS FROM EDUCATION COLLEGES IN MYANMAR CONCERNING CONTINUOUS PROFESSIONAL DEVELOPMENT

Nant Mar Lar Than[1]

Abstract

The major purpose of this study is to investigate teacher educators in the Education Colleges (ECs) in Myanmar on their knowledge concerned with their fields of studies, their values and their effort in performing their educational tasks. On the other hand, this study is to enlighten the importance of Continuous Professional Development (CPD) and arouse those teacher educators to make effort for their professional development (PD). Based on the theories and research papers concerning CPD, analyzing the problems, developing the research questions, preparing questionnaires, collecting data, analyzing information and interpreting the collected data were systematically done. By using the random sampling method 4 ECs (Thingangyun, Pathein, Taunggoo, and Hlegu) were chosen to be investigated. The result supposed that teacher educators can describe what CPD is in their own words, currently they are conducting CPD activities, they have positive attitude towards CPD, most of those have future plan to conduct PD activities, although they have some drawback and barriers, they have desire to implement by observing others' performances, accepting suggestions and reflecting themselves. It is hoped that this research can directly support teacher educators of Education Colleges, especially on how they can improve their PD. It is also hoped to support not only for staff development but also for producing qualified teachers.

Keywords: professional (PD), continuous professional development (CPD), teacher education (TE), continuous professional development activities

Introduction

The PD of teachers is a central concern for quality education and must be linked to all areas of teacher education and educational research. In order to improve the quality of teachers, it must ensure that teachers initially receive a good TE. In this sense, EC is the initial source for pre-service teachers.

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Therefore, ECs must ensure that student teachers receive a good teacher education which can provide them knowledge, skill and attitude to prepare their work as teachers. Therefore, the quality assurance of teacher educators becomes a critical role in our country.

Purpose of the study

The major purpose of this research study is to investigate the knowledge, value and effort of teacher educators of Education Colleges in Myanmar. Specifically, this study is to investigate

- How much extent teacher educators understand about CPD?
- What kinds of activities they conduct for CPD? ,and
- How is their attitude towards CPD?

Research hypothesis

- Teacher educators of Education Colleges can describe CPD in their own words.
- Most teacher educators participate in CPD activities.
- Those teacher educators have the positive attitude towards CPD.

The Scope of the study

Teacher educators of 4 Education Colleges namely Thingangyun EC, Pathein EC, Taunggoo EC, and Hlegu EC were surveyed in CPD awareness, value and future plan. Teacher educators from those ECs had to answer a questionnaire which consisted of five sections such as section 1- Background information of teacher educator, section 2- CPD understanding, section 3- CPD activities, section 4- Value on CPD and section 5- Future plan for conducting CPD. Some of the questions are necessary to give text response. (Questionnaire is attached in appendix 1)

Definition of Key Terms

> **Professional Development – Professional Development** is learning to earn or maintain professional credentials such as academic degrees to formal coursework, attending conferences, and informal learning opportunities situated in practice. (Speck, M & Knipe , C .(2005)

Continuous Professional Development - The maintenance and enhancement of knowledge, expertise and competence of professional throughout their careers to a plan formulated with regard to the needs of the professional, the employer, the profession and society. (Madden and Mitchell,1993, p.12)

Teacher Professional Development - Teacher professional development means teachers' learning, how they learn to learn and how they apply their knowledge in practice to support pupil learning (Avalos.B, 2011)

Teacher education and teacher educator- Teacher education or Teacher training refers to the policies, procedures, and provision designed to equip (prospective) teachers with the knowledge, attitudes, behaviors, and skills they require to perform their tasks effectively in the classroom, school, and wider community. Although ideally it should be conceived of, and organized as, a seamless continuum, teacher education is often divided into these stages: Initial teacher training/education; Induction; Teacher development or continuing professional development. ("teacher education" Definitions.net. 2018)

Review of Related literature

A search was conducted of the subject pedagogy using the terminologies such as teacher education, continuous professional development, and teacher professional development. Books and articles that dealt with those terms were selected.

Professional development

Myanmar's National Education Law also states "The objectives of national education are as follows: To produce good physically, mentally, morally, socially and psychologically well-developed citizens with critical thinking skills…." (Chapter -2) and "The Ministry of Education shall produce teachers who value the languages , literature, culture, arts, traditions, and historical heritages of all ethnic groups in the nation and who have the ability to guide the development of all ethnic groups and the modern development of the nation….." (Chapter 5)

The National Education Law legislates that all teachers need to be qualified: it defines a teacher as an 'educator who has qualifications for serving at a specified level of education.' Under the law, 'the Ministry and related ministries shall specify the duties and rights of teachers' and ensure 'there shall be no discrimination among the teachers in any subjects at each education level.' They are also listed as responsible arranging for upgrading teaches' quality and giving them international exposure'.

The role education is expected to play in the nation's social and economic development is emphasized by its centrality to these wider reforms as expressed in a number of key policy documents. These are:

- The 30-Year Long-Term Education Development Plan (2001-2031) which aims to 'uplift national education through a series of reform programmes including up-grading the teaching-learning processes and the teacher education system;
- The Framework for Economic and Social Reforms (FESR) 2012-2015) which set out the government's priority policies; upgrading teacher training and addressing teacher remuneration,

The National League for Democracy's 2015 Election Manifesto confirms the new government's intention to continue focusing on teacher education to ensure a good education system.

Myanmar's **Teacher Competencies Standard Framework (TCSF)** has been developed by a respected and committed group of national professional education experts. UNESCO through the DFAT Australian and funded Strengthening Teacher education in Myanmar (STEM) project, provided technical assistance to the Working Group inline with the projects aim to support the Ministry of Education to improve the quality of teachers and teaching in Myanmar. Myanmar's TCSF can be used to

- Provide clear direction to policy makers, curriculum developers and teachers on what constitutes professional practice and expected pedagogical content knowledge;
- Guide the revision and on-going monitoring of teacher training programmes, including the development of a curriculum framework;

- Help assess pre-service teacher training graduates to ensure they meet minimum standards for accreditation;
- Strengthen peer mentoring and instructional supervision by teacher educators, education supervisors, school heads and classroom teachers, and,
- Establish a clear path for merit-based teacher placement and career advancement, shifting performance evaluations from educational background and years of teaching to observable performance and competency to support students' learning.

The framework is for all teachers at various stages of their professional development including Principals of Education Colleges and schools, Deans of Faculties of Education, and curriculum developers in universities, colleges, teacher training providers.

The teacher competency standards refer to the expectations of teachers' knowledge, skills, and attributes and required levels of performance at various stages of their teaching career and are organized in four domains.

- Professional knowledge and understanding
- Professional skills and practices
- Professional values and dispositions
- Professional growth and development

Among those, domain -4 incorporates teachers' habits, motivation and actions related to their ongoing learning and professional improvement. The areas of competence specific to this domain relate to teachers capacity for: reflective practices, collaborative learning and initiative for research culture.

Anne Campbell, et al.: pointed out in "**Practitioner Research and Professional Development in Education**" is that the professional development of teachers has become a high profile, politically 'hot' issue. All teachers are required to engage in professional development; to identify, document, record and evaluate it. (p-13). In England, more recent policies aimed at moving professional development funding to schools that individual schools and classrooms are to become 'learning communities' and the main, key, future sites of professional development. (p-14).

Reflective Practice and professional development

The book "**Reflective practice for Educators (Professional Development to Improve Student learning**" written by Karen F. Osterman and Robert B. Kottkamp is about reflective practice, a meaningful and effective professional development strategy. The authors stated that reflective practice depends on careful observation and data-based analysis of practice as well as experimentation with new ideas and new strategies.(p-vi)The author also pointed out that reflective practice is a professional development strategy: it is also a problem-solving strategy. It is about individuals working with others to critically examine their own practice to resolve important problems. (p-21) Reflective practice leads to real professional development, where deep personal learning actually takes place.(p181) Those who participate in reflective practice become more comfortable empowering others. They began to see connections where they had seen none before. They began to realize that they could make a difference. As professionals come to understand themselves better, they have a better understanding and appreciation for others- colleagues and students. In sum, reflective practice is an empowering and motivational process because it responds to basic human needs for competence, autonomy, and relatedness. The central reflective process of communication and collaboration are empowering. They enable individuals to be more effective, to assume greater responsibility for their own performance and learning, and to work more closely and more productively with others in the workplace. When individuals are more effective, they enable organizations to be more effective. (p-188)

Marilyn Cochran-Smith viewed teachers as **reflective practitioners** and she described in her book is that experienced as well as prospective teachers are expected to function as reflective practitioner, work collaboratively in learning communities, and demonstrate that their teaching leads to increased student achievement. (Cochran-Smith,2006, p-27)

CPD activities

Different terminologies are used to describe the CPD activities in different research papers. In an initial survey by **SAQA-FPI**, the terms formal and informal are used to categorize CPD activities as shown in the following table. (SAQA-FPI, 2015)

Formal CPD activities	**Informal CPD activities**
Verifiable CPD	Unverifiable CPD
Verifiable CPD	Non-verifiable
Verifiable	Self-directed
Structured activities	Unstructured activities
Accredited activities	Accredited activities
Learning activity	Learning activity
Live training events	Self study
Structured CPD hours	Unstructured CPD hours
Courses	Normal daily work
Active activities	Passive activities
Class contact	
Structured activities	Work-based activities
Learning event	
Training event	
Developmental activities	Word-based activities
Conferences	Conferences
Workshops	Workshops
Mentorship	Mentorship
Lecturing	Lecturing
Seminars	Seminars

The CPD Research Project was launched in late 2010 by Amanda Rosewarne with the support of Kigston University Business School. Recognising a lack of independent research within the area of CPD and lifelong learning the project has primarily focused on exploring three core areas: Individual perceptions of CPD, The effectiveness of CPD schemes and activities and The organizational benefits of CPD. The research has incorporated various quantitative and qualitative research streams and more information can be found at www.cpdresearch.com. The survey was available

online through the later par of 2011. it was advertised to the Association of Project Management's membership and advertised on the website, as a voluntary and confidential survey.

In that survey, different terms for CPD activities were used as follow.

- Taking part in an online discussion forum - Acquiring knowledge from browsing on the internet - Listening to relevant work live - Signing into online web seminars
- Keeping a reflective diary over an extended period of time - Reflective discussions with colleagues as part of a formal development review process - Reflective discussions with colleagues that are informal but relevant to my role
- Technical training e.g. courses where I am learning new software or applications - Working towards a vocational qualification sponsored by my employer - Working towards a vocational qualification that I am paying for myself
- Membership of committees at my place of work
- Keeping a portfolio record of CPD activities I have undertaen
- Regular reading of journals and books relevant to my organization - Problem solving in groups for specific challenges or issues
- Authorship of technical papers - Authorship of articles for online or trade publications
- Part time teaching related to my sector - Other personal activities outside of work - Preparing and delivering presentations - Formal distance and open learning courses - Attending relevant conferences or seminars
- Acting as a coach or mentor for a colleague - Been coached or mentored by a professional

Smith (2003) pointed out that these various kinds of learning activities differ, however, in their impact on teacher educators. Research-related activities in particular, such as self-study and inquiry, are often seen as

important activities when it comes to the advancement of one's professional development and the innovation of teaching practices.

Research Method

This study is aimed to investigate the teacher educators in the Education Colleges in Myanmar on their knowledge concerned with their fields of studies, their values and their effort in performing their educational tasks by using the descriptive research.

Research design and procedure

Descriptive research design

By using a questionnaire, teacher educators in four Education Colleges were surveyed.

Table 1: Population and Sample Size

	Number of respondents (n=193)												Total		
	lecturer			Assistant Lecturer			Tutor			Demonstrator					
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
Thingangyun	1	15	16	3	19	22	3	21	24	1	4	5	8	59	67
Pathein	0	12	12	0	10	10	0	13	13	1	2	3	1	37	38
Taunggoo	1	10	11	1	11	12	3	15	18	1	3	4	6	39	45
Hlegu	1	14	15	0	16	16	1	10	11	0	1	1	2	41	43
	3	51	54	4	56	60	7	59	66	3	10	13	17	176	193

Note: n= number, M= male, F= female, T= total

Under the supervision of the Principle of Thingangyun Education College, a set of questionnaire was prepared during August, 2017. In order to get validity for the questionnaire, a pilot test was conducted to some teacher educators from Thingangyun Education College in the late of October, 2017 and modified it. Finally, a set of questionnaire composed of five sections could be developed. After getting the permission from the Principles of selected ECs, the researcher started the survey in first and second weeks of December, 2017. For Thingangyun and Hlegu ECs, the survey was conducted by the researcher, however, for other two ECs, questionnaire papers were sent

by post. After collecting all questionnaires, data entry, interpretation and report writing were started during February, 2018.

Research Findings

Section 1. Background information

Totally, Lecturers (n=.54, 28%), assistant lecturer (n= 60, 31%), tutor (n=66,34%) and demonstrators (n=13,7%) participated in the surveyed. The majority of the respondents was female (n=176, 91%). 71 out of 193 respondents have over 25 years of teaching services 37%) and 44 out of total respondents have under 5 years of teaching services (23%) The detail information is described in the following tables.

Table 2: Number of respondents (by gender)

	Male	**Female**	**Total**
Thingangyun	8	59	67
Pathein	1	37	38
Taungoo	6	39	45
Hlegu	2	41	43
n	17	176	193
%	9%	91%	100%

Table 3: Number of respondents (by position)

	n	**%**
Lecturer	54	28%
Assistant lecturer	60	31%
Tutor	66	34%
Demonstrator	13	7%
Total	**193**	**100%**

Table 4: Number of respondents (by total services)

Total teaching experiences/ECs	under 5 yr	6yr-10yr	11 yr-15yr	16 yr-20yr	21yr-25	Over 25 yr	total
Thingangyun	18	6	16	1	4	22	67
Pathein	9	1	9	1	1	17	38
Taungoo	11	5	11	2	2	14	45
Hlegu	6	2	13	2	2	18	43
n	44	14	49	6	9	71	193
%	23%	7%	25%	3%	5%	37%	100%

Section 2- CPD understanding

For question 1 in section 2, 96 out of 193 responded "yes" but 86 out of 96 (90%) gave text responses and 53 out of 86 (62%) gave the relevant responses. Looking from the view of the total respondents, the relevant responses were 27%. The detail information was described in table 5 & 6.

Table 5: Part 2- CPD Understanding, Question 1

Q -1. Do you know what CPD is? If yes, please describe it.	
Answer	**%**
Yes	49.7%
No	6.7%
unsure	43.5%
Total	100%

Table 6: Part 2, CPD Understanding , Question 1, relevancy of text response

	Q -1. Do you know what CPD is? If yes, please describe it.			
ECs	**Total**	**Yes**	**Text response**	**Relevant**
Tthingangyun	67	42	35	23
Pathein	38	12	12	7
Taungoo	45	21	20	14
Hlegu	43	21	19	9
	193	96 (out of 193)	86 (out of 96)	53 (out of 86)
		50%	90%	62% (of text response)
				27% (of total respondents)

Some of the relevant text responses are as follows.

- Learning continuously, lifelong learning
- The process of making effort to promote our knowledge, skill and practice for community development
- Creating learning opportunities
- Learn and innovate continuously
- Making effort for the quality improvement
- Learning continuously for effective teaching learning
- PD is defined as activities that develop an individual's skills, knowledge, expertise and other characteristics as a teacher
- Attending workshop and sharing knowledge, reading related books, access educational information by using several media, lesson study
- Transmission knowledge to new generation and sharing something new techniques what we've learned
- Continuously making effort for teacher education development and assessing it.

For question 2 in section 2, 150 out of 193(77.7%) said they are currently conducting CPD activities. Respondents didn't need to give text response for this question but it can be counter checked with the responses of section 3.The detail information for question 2 is described in table 7.

Table 7: Part 2- CPD Understanding, Question 2

Q -2. Currently, are you conducting any CPD activities?	
Answer	%
Yes	77.7%
No	7.3%
unsure	15.0%
Total	100%

For question 3, 34.2% of total respondents (66 out of 193) chose answer "yes", 85% of those (56 out of 66) gave text response and 29% of

those (16 out of 56) could relevantly write the require answer. But, only 8% of total respondents know how teacher competencies are described in TCSF.

Table 8: Part 2- CPD Understanding, Question 3

Q -3. Do you know how it was described for CPD in teacher competence standard framework (TCSF)? If yes, please state it.	
Answer	**%**
Yes	34.2%
No	10.9%
Unsure	54.9%
Total	100%

Table 9: Part 2. Cpd Understanding, Question 3, relevancy of text responses

Part 2, CPD Understanding (total responsdents-193)				
	Q -3. Do you know how it was described for CPD in teacher competence standard framework (TCSF)? If yes, please state it.			
	total	**yes**	**text response**	**relevant**
Thingangyun	67	29	26	6
Pathein	38	10	7	3
Taungoo	45	14	12	3
Hlegu	43	13	11	4
	193	66 (out of 193)	56 (out of 66)	16 (out of 56)
		34%	85%	29% (of total text response)
				8% (of total respondents)

Some of the text responses are as follows.

- CPD in TCSF
    - Professional knowledge and understanding
    - Professional skill and practice
    - Professional value and attitude
    - Professional development

- CPD in TCSF
    - Subject matter skill
    - Applying relevant teaching methodology in line with the current situation
- CPD in TCSF
    - Subject matter skill
    - Lesson planning skill
    - Teaching aids applying skill
    - CCA teaching skill
    - Assessment skill
    - Positive attitude
- CPD in TCSF
    - Creativity
    - Problem solving skill
    - Communication and collaboration skill

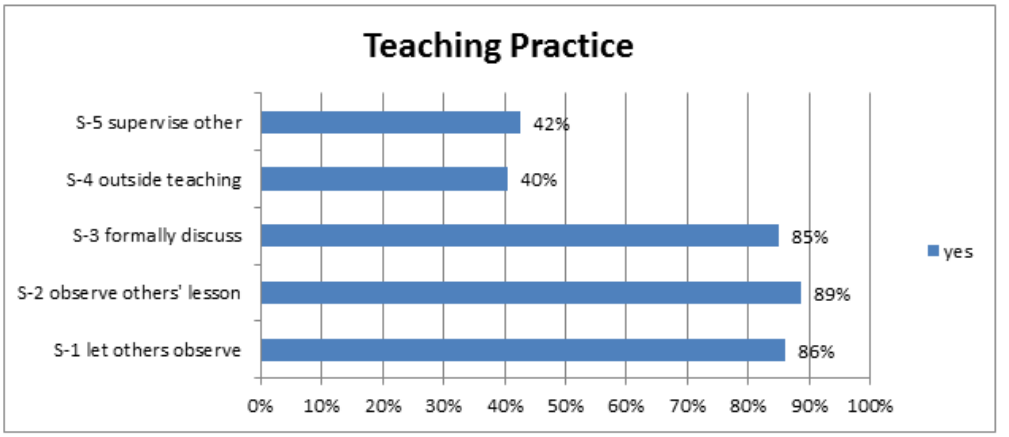
Section -3. Engagement in CPD activities

Totally, 20 statements concerning CPD activities were given in section 3 and it could be divided into 5 categories such as teaching practice, participating in school activities, attending courses or seminars, reflective practice and knowledge acquisition.

Categories	Section 3. Do you participate in the given CPD activities?	yes	
		n	%
Teaching practice	S-1 letting others observe my teaching in the classroom	166	86%
	S-2 observing others' lesson	171	89%
	S-3 formal discussion with colleagues	164	85%
	S-4 outside teaching	78	40%
	S-5 supervising other	82	42%
Participating in school activities	s-6 participating in the activities of school council	188	97%
	S-7 participating in problem solving	174	90%
	S-8 participating in setting school's policy, vision, mission or rules	132	68%
Attending courses for further study	S-9 trying to sit entrance exam	87	45%
	S-10 attending courses conducted by department	168	87%
	S-11attending courses conducted in foreign country	18	9%
	S-12 attending conference, seminars or workshop related with my work	148	77%
Reflective practice	S-13 keeping records as portfolio	164	85%
	S-14 reflecting on my work done	190	98%
Knowledge acquisition	S-15 reading books	190	98%
	S-16 seeking knowledge from internet	164	85%
	S-17 observing displays and competitions	148	77%
	S-18 participating in competition	124	64%
	S-19 writing articles and being published	18	9%
	S-20 writing and reading research papers ,	112	58%

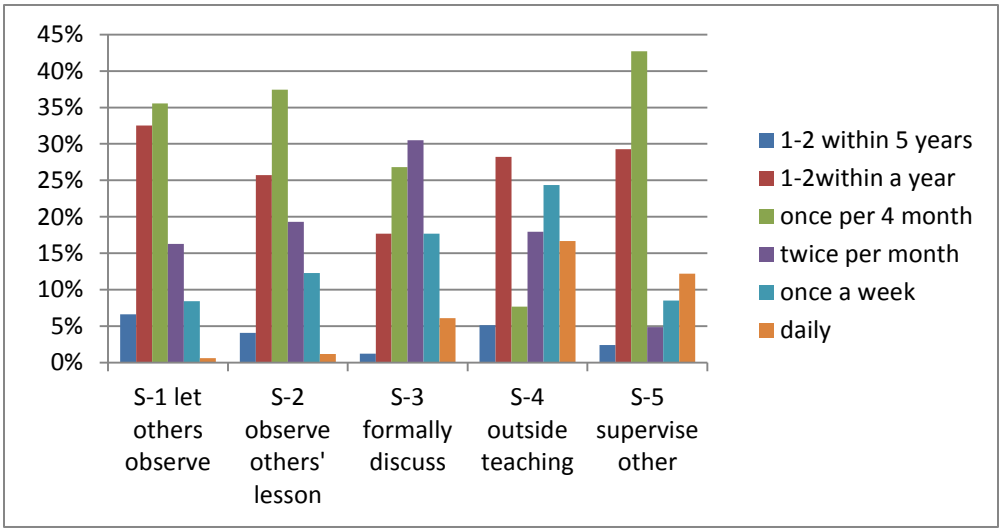
Concerning teaching practice, over 85% of respondents said that they let the colleagues observe their teaching in the classroom and also they observe their colleagues' teaching. 85% of all respondents said that they formally discuss about lesson observation. For the statement "outside teaching", 40% of total participants chose "yes" and 42% said they supervise others' teaching .

Graph 1.1: Section 3, Teaching practice (statement 1-5)



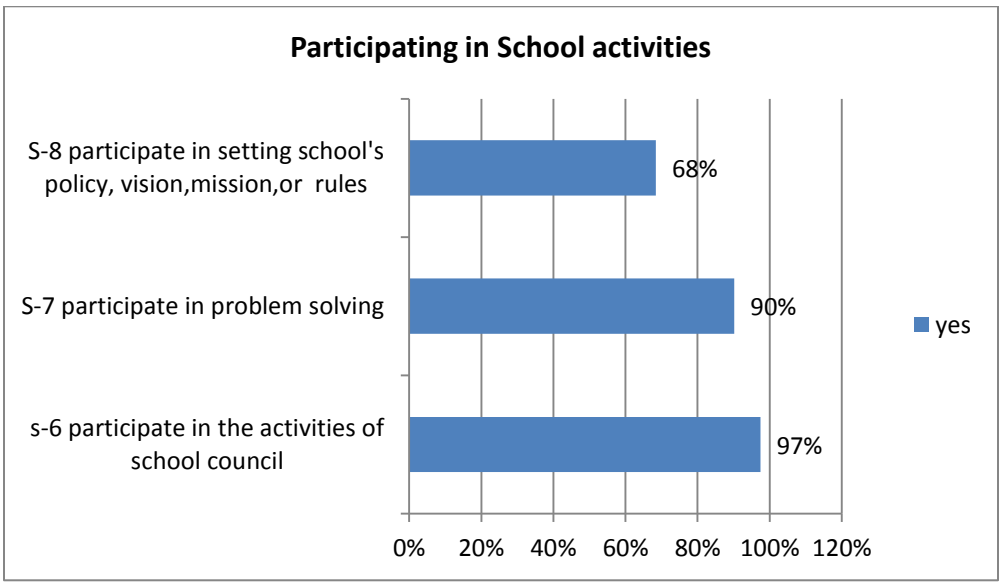
Over 40% of respondents who chose yes for statement 5 said that they supervise other's teaching once per month. Similarly, over 35% of respondents who chose yes for statement 1 and 2 said that they let others observe their teaching and they observe others' teaching once per month. The detail information can be seen in graph 1.2.

Graph 1.2. Section 3, Teaching practice (statement 1-5)



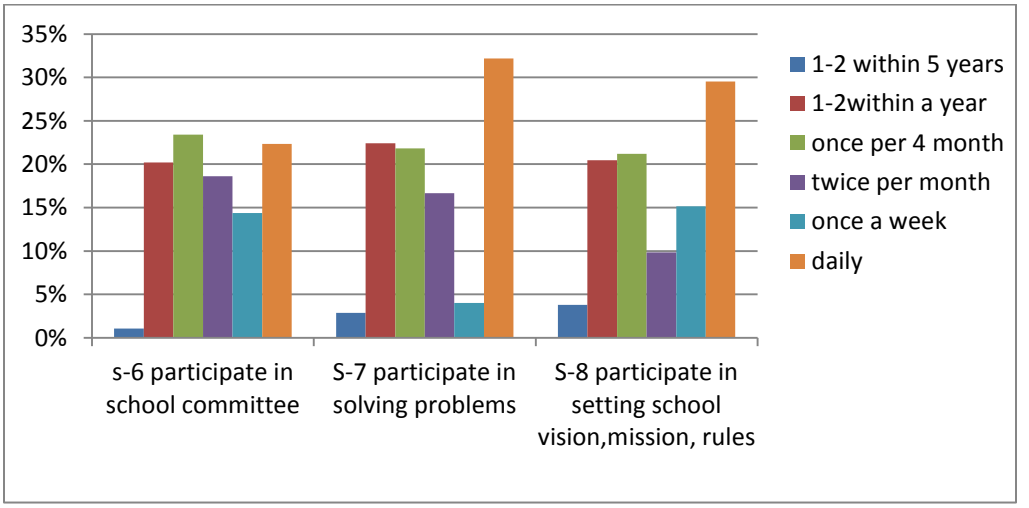
The statements concerning participating in school activities, over 90% of total respondents said that they participate in the activities of school council and in solving problems emerged in school and nearly 70 % answered that they involved in setting school policy, rules, vision or mission.

Graph 2.1: Section 3. Participating in school activities (statement 6-8)



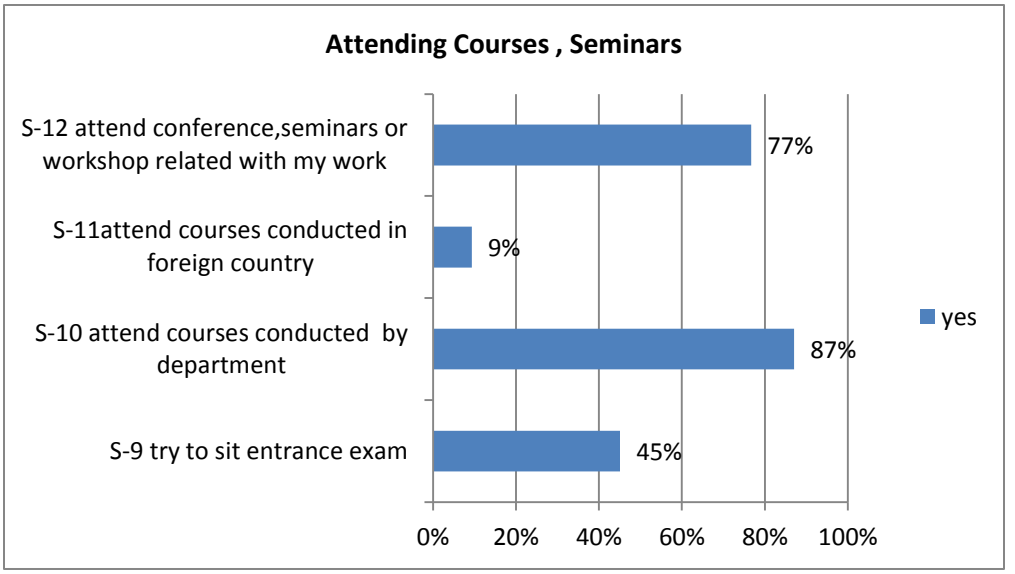
Around 30% of the respondents who chose "yes" for statement 7 & 8 said that they conduct those activities daily. Detail information for statement 6 to 8 is shown in graph 2.2.

Graph 2.2- Section 3. Participating in school activities (statement 6-8)

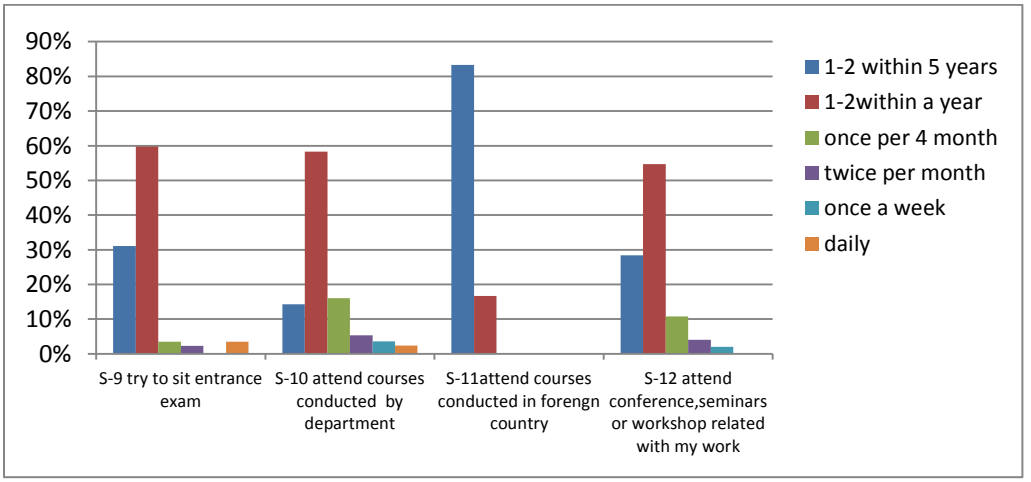


For the statements about attending courses or seminars, over 75% of those participants attend courses conducted by the department and attend conference, workshop or seminar related with their work. 45% of total respondents mentioned that they try to sit entrance examination for further study and only 9% said that they got chance to attend courses conducted in foreign countries. The detail information are shown in graph 3.1 and 3.2.

Graph 3.1. Section 3, Attending Courses, seminars (statement 9-12)

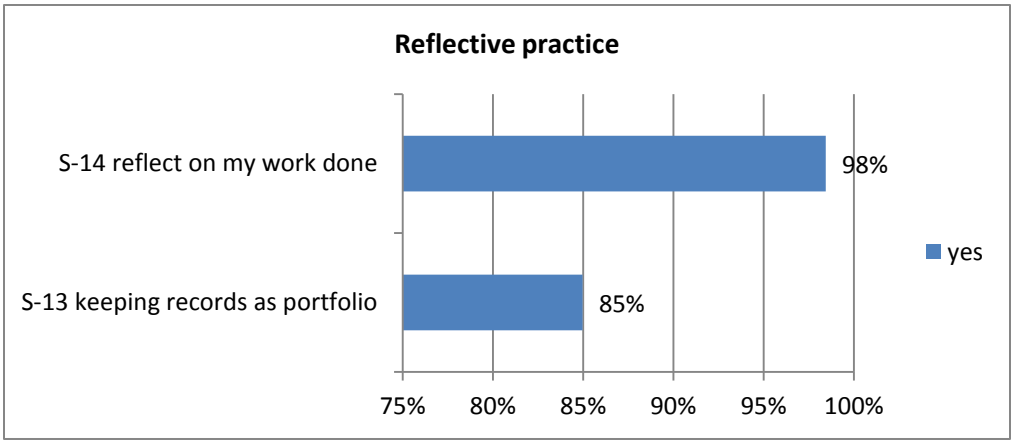


Graph 3.2: Section 3, Attending Courses, seminars (statement 9-12)

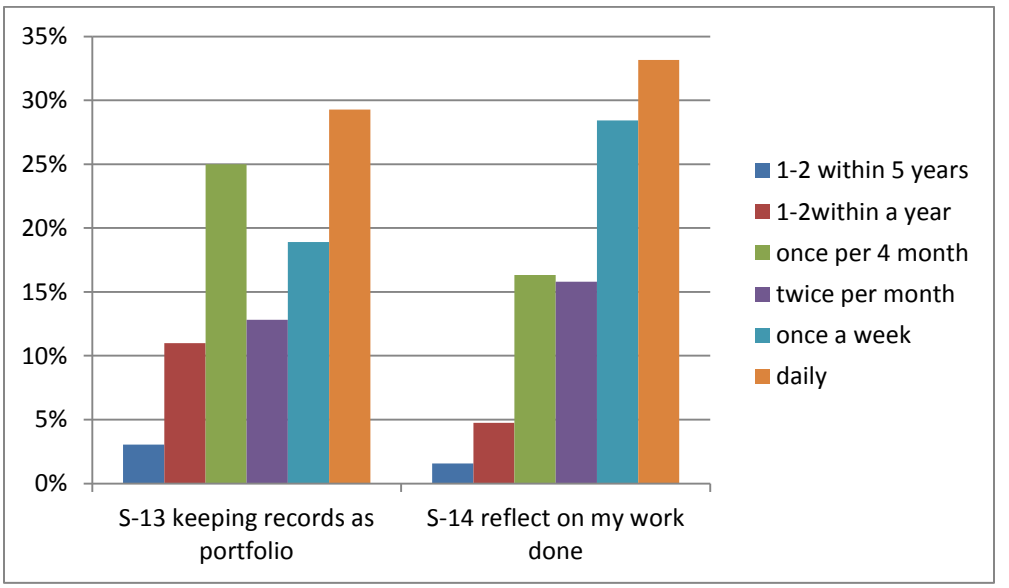


For the category 3, over 80% of those participants chose "yes" for the activities about keeping records as portfolio and reflect on their work done and over 25% of those respondents said that they do those activities everyday.

Graph4.1: Section 3. Reflective practice (statement 13 & 14)

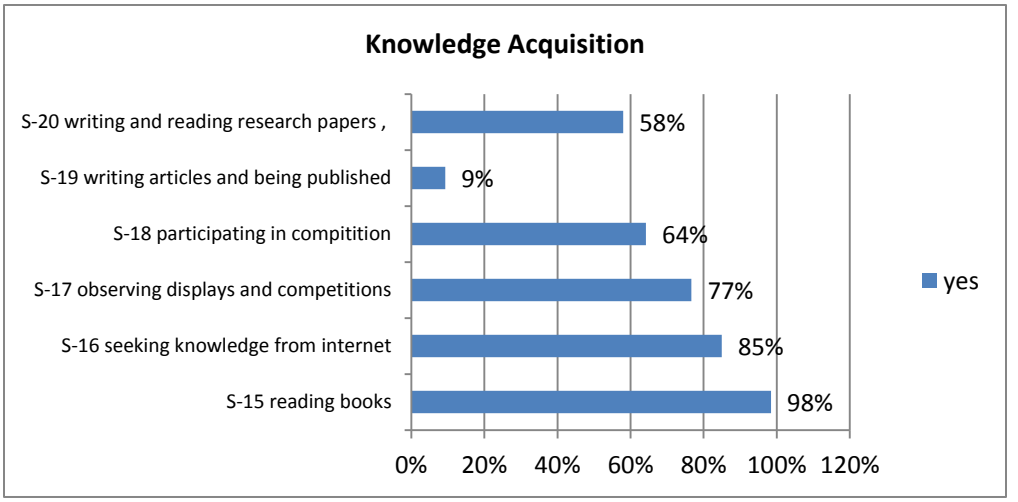


Graph4.2. Section 3. Reflective practice (statement 13 & 14)

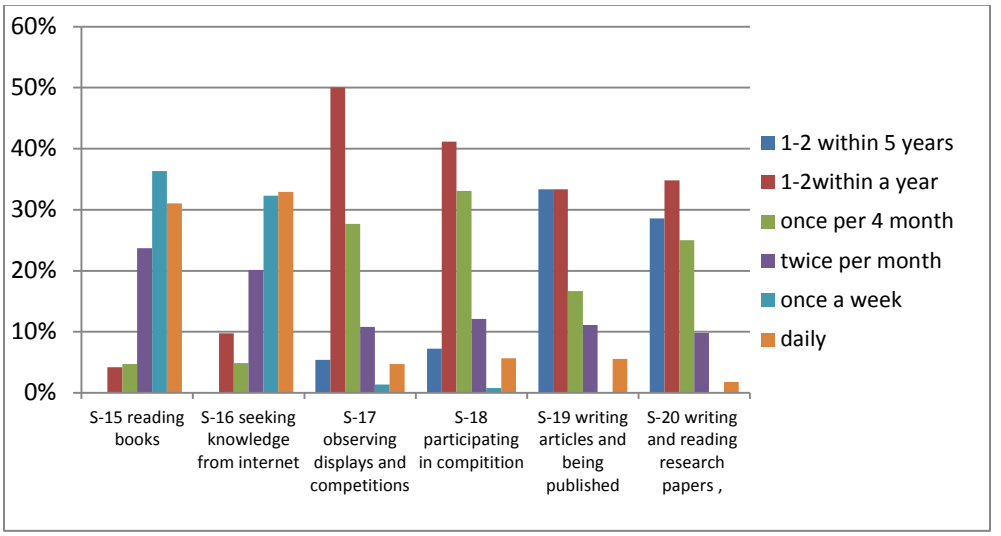


Regarding knowledge acquisition, most of the respondents said that they read books, seek knowledge from internet, observe teaching aids display and competition and participate in teaching aids competition. The detail information can be seen in graph 4.1 & 4.2.

Graph 4.1: Section 3. Knowledge acquisition (statement 15-20)



Graph 4.2: Section 3. Knowledge acquisition (statement 15-20)



Section 4. CPD value

Regarding how they value CPD, 3% (n=6) agree that doing for CPD is just wasting time, 34% (n=65) agree that there is no award for doing CPD, 6% (n=11) agree that there is no good result by doing CPD, 95% (n=183) agree

that doing CPD improve their expectation for work, 99% (n=191) agree that doing CPD support their capacity improvement and 96%(n=185) agree that doing for their CPD is also effective for their organization.

Table 10: Section 4- CPD value

Section 4 CPD value					
		disagree		agree	
		N	%	N	%
1	doing for CPD is just wasting time	187	97%	6	3%
2	no award for doing CPD	128	66%	65	34%
3	no good result by doing CPD	182	94%	11	6%
4	doing CPD improve my expectation	10	5%	183	95%
5	doing CPD support my capacity improvement	2	1%	191	99%
6	doing for my CPD is effective for my organization	8	4%	185	96%

Section 5 future plan

Regarding future plan, 96% said that they have future plan. In view of their detail future plan , for the improvement of CPD ,91% of respondents will do by reflecting themselves, 88% by getting suggestion from others and self assessing, 84% by following the instruction or requirements of the organization, and 76% by observing how peers doing.

Table 11.1: Section 5 Future plan for CPD

Q 1. Do you have any future plan for CPD?	
Yes	96%
No	4%

Table 11.2: Section 5 Future plan for CPD

Q 2 what will you use for your future plan?		
1	observe how colleagues doing	76%
2	suggestions of others	88%
3	reflect myself	91%
4	instruction or requirements of my organization	84%
5	self assessment	88%
6	Other	

Relating the drawback and barriers of their future plan, 62% mentioned money, 52% said it is unavailable the human resources who can give technical support for their future plan and 22% thought that there is a gap analysis on their prior capacity and requirements. The detail information is as follows.

Table 11.3: Section 5 Future plan for CPD

Q 3 drawback and barriers for your future plan		
1	don't have enough time	39%
2	gap analysis on my prior capacity and requirements	22%
3	unavailable required resources	48%
4	unavailable human resourses who can give technically support	52%
5	money	62%
6	difficult to go where workshops or seminar conducted	40%
7	other	

Discussion, suggestion and conclusion

Discussion

The research findings indicate that nearly half of the teacher educators in Education Colleges knew the terminology of CPD, however, only 27% of the participants could give the relevant text response and some of them could give detail explanation about what CPD is. Regarding question 2 in Section 2, the research findings show that nearly 80% of total respondents are currently carrying out CPD activities. Although TCSF is still in the developing process, 8% of total respondents could give the relevant text responses.

When the participants were asked if they did the given CPD activities in Section 3, most of them gave positive answers. It shows that their answers are consistent to each other. Most of the participants answered that they participated in the activities of lesson observation, reflection and discussion that support effectiveness in teaching, improvement in teaching skill, collaborative skills and reflective skills. It was good point.

Over 90% of the participants said that they were participating in the college activities. This also could advantage the PD. It is also an important point because individual development is as important as staff development for the development of an organization.

Teachers who work in Education Colleges, that produce good teachers should try to become life-long learners who continuously update their learning and make themselves improve in teaching. This research findings show that, 75% of the participants engage in attending trainings for further studies, workshops and educational seminars. The question that enquires if they try to sit for the entrance examination for further studies abroad, only 9% answered they did. It seems that teacher educators have very few chances to study abroad.

Relating to the question about the reflective practice that includes in the 21st century skills, EC teachers answered that they reflected their work and kept portfolio record. 85% of the participants answered that for their information and knowledge, they search internet and read books. 9% wrote articles and their work was published, 58% said they did research and research paper reading. Although inter Education College teaching learning material competition and action research competition are conducted yearly, only under 70% of those respondents want to compete in those contests.

According to the research findings, most of the participants did not agree the statement such as “doing CPD is just wasting time”, “no award for doing CPD” and “no good result by doing CPD and they agree that conducting CPD can improve their expectation, can support for their capacity improvement and is effective for their organization. Therefore, it can be said that EC teachers have positive attitude towards CPD.

Almost all respondents said that they have future plan to conduct CPD activities. They expressed that the drawbacks for realizing their future plan were money and technical assistance. 62% of teachers said they have financial problem for realizing their future plan whereas 52% mentioned technical assistance.

Concerning with teacher competencies, 22%of teachers answered that they did not have the capacity to know how much gap was there between their own competencies and the competencies that a teacher educator should have.

It can be believed that teacher educators are willing to try for their CPD even though they have these difficulties because they answered that for their improvement of PD, they would observe how their colleagues are doing, reflect themselves, ask suggestions from other, and follow the department instructions.

Suggestions

- Teacher educators should be encouraged to continue doing lesson study
- Teacher educators should be encouraged to do more educational research activities not only for competition purpose, also for their continuous learning
- There should be incentive for teacher educators to be motivated for doing CPD activities
- Teachers from the study fully aware of the importance of CPD, however, it still requires to have a concrete plan and enough support for EC teachers.
- More research is required to identify how to motivate teacher to continue for their CPD.

Conclusion

Professional development is very important in every professional field. It can be said that professional development in teacher education is more important as Educational Faculties are the main source of producing good teachers who will cultivate good citizens of the country. In this regard, the quality of teacher educators becomes most important. What is more important is their professional development which keeps them upgrading their capacity in teaching. With this purpose, this research was conducted. As several studies pointed out, the responsibility of teacher education institutes is to encourage and steer the professional development of their staff. Regular staff meetings, lesson study, arranging feedback from supervisors, colleagues and students, and participating in school activities, are CPD activities conducted as routine works and are reasonably easy to implement. Although more research evidence is needed to know how teacher educators to be motivated for doing

CPD activities , it is hoped that this research can directly support teacher educators of Education Colleges how they can improve their PD. It is also hoped to support not only for staff development but also for producing qualified teachers for Myanmar.

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Appendix 1

Questionnaire for
Investigating the knowledge, value and effort of teacher educators
From Education Colleges in Myanmar concerning
Continuous Professional Development

Section 1: : Background information

1. Education College ……..
2. Male or Female ……
3. Education Background……..
4. Your current position……
5. Your total services (please √ the relevant one)

Under 5 yr	6 -10 yr	11-15 yr	16 -20 yr	21-25 yr	Over 25 yr

6. Your total services for current position (please √ the relevant one)

Under 1 yr	1-5 yr	6-10 yr	11 -15 yr	Over 15 yr

Section 2: : CPD Understanding
(please √ the relevant answer)

1	**Do you know what CPD is?**	**Yes**	**No**	**Unsure**
	If yes, please describe it.			

2	**Currently, are you conducting any CPD activities?**	**Yes**	**No**	**Unsure**

3	**Do you know how it was described for CPD in teacher competence standard framework (TCSF)?**	**Yes**	**No**	**Unsure**
	If yes, please state it.			

Section 3. CPD activities

(Please tick whether you are currently conducting the given CPD activities and rate it)

	Section 3. Do you participate in the given CPD activities?	no	yes					
			1-2 within 5 years	1-2within a year	once per 4 month	twice per month	once a week	daily
Teaching practice	S-1 letting others observe my teaching in the classroom							
	S-2 observing others' lesson							
	S-3 formal discussion with colleagues							
	S-4 outside teaching							
	S-5 supervising other							
Participating in school activities	s-6 participating in the activities of school council							
	S-7 participating in problem solving							
	S-8 participating in setting school's policy, vision, mission or rules							
Attending course for further study	S-9 trying to sit entrance exam							
	S-10 attending courses conducted by department							
	S-11attending courses conducted in foreign country							
	S-12 attending conference, seminars or workshop related with my work							
Reflective practice	S-13 keeping records as portfolio							
	S-14 reflecting on my work done							
Knowledge acquisition	S-15 reading books							
	S-16 seeking knowledge from internet							
	S-17 observing displays and competitions							
	S-18 participating in competition							
	S-19 writing articles and being published							
	S-20 writing and reading research papers ,							

Section 4. CPD Value

Section 4 CPD value					
		Strongly disagree	disagree	agree	Strongly agree
1	doing for CPD is just wasting time				
2	no award for doing CPD				
3	no good result by doing CPD				
4	doing CPD improve my expectation				
5	doing CPD support my capacity improvement				
6	doing for my CPD is effective for my organization				

Section 5 Future plan for CPD

Q 1. Do you have any future plan for CPD?	Yes	No

Q 2 what will you use for your future plan? Please tick.		
1	observe how colleagues doing	
2	suggestions of others	
3	reflect myself	
4	instruction or requirements of my organization	
5	self assessment	
6	Other	

Q 3 which are the drawback and barriers for your future plan? Please tick.		
1	don't have enough time	
2	gap analysis on my prior capacity and requirements	
3	unavailable required resources	
4	unavailable human resourses who can give technically support	
5	money	
6	difficult to go where workshops or seminar conducted	
7	other	

DEVELOPING AN INSTRUCTIONAL LEADERSHIP MODEL FOR PROMOTING PRIMARY STUDENTS' CREATIVE THINKING SKILLS

Hla Thet Paing[1], Aung Lin[2]

Abstract

The purpose of the study is to develop an instructional leadership model for promoting primary students' creative thinking skills. This study is based on Blase and Blase's model, Tsai's model, Mellou's model and Cole's model. This study intends to investigate whether there would be significant differences in the instructional leadership of principals and science subject leaders in term of school locations, school level, position and qualification. It is based on the six instructional leadership dimensions. Both quantitative and qualitative approaches were applied in this study. Cluster sampling method was used: 112 principals and science subject leaders, 482 lower primary school teacher and 240 lower primary school students from 96 schools were selected as participants. Independent Sample *t*-Test, one way ANOVA, post-hoc Tukey HSD, Pearson product-moment correlation, simple linear regression and multiple regression were employed for the analysis of quantitative data. A significant difference was found in overall instructional leadership performance by school level (F=3.39, p=.037). Principals and science subject leaders in primary schools rated overall instructional leadership performance higher than those in middle schools (*Mean difference*=.30, p=.023) and those in high schools (*Mean difference*=.28, p=.040). Principals and science subject leaders' performance on instructional leadership was positively and significantly correlated with lower primary school teachers' performance on teaching practices. Performance of lower primary school teachers on teaching practices appears to be the best predictor of lower primary school students' creative thinking skills. Qualitative study suggested that school locations, school plants and facilities, and teaching learning materials may be the main source effecting the differences in instructional leadership. Based on the research findings, this study reveals an instructional leadership model for promoting primary students' creative thinking skills.

Keywords: Instructional Leadership, Teaching Practice, Creative Thinking

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Introduction

In the fast-changing world, understanding, identifying, and nurturing the creative potential is relevant in education if teachers want students able to solve academic and personal problems and challenges, to find innovative solutions and alternatives, and to have better tools for success. According to Facione (n.d., cited in Rusbult, 2001), creative or innovative thinking is the kind of thinking that leads to new insights, novel approaches, fresh perspectives, new ways of understanding and conceiving of things. Creativity is an effective resource that resides in all people and within all organizations.

Moreover, to maintain the country's competitiveness in the twenty-first century, the skilled scientists and engineers must be cultivated to create tomorrow's innovations. To do so, the creative thinking skills of the children need to be nurtured since they are in early childhood (Pee, 2012). If the goal is to teach and nurture future scientists, the principals as instructional leaders need to understand, support and nurture the creative. However, Dr. Khin Zaw (2001) stated that education is already overloaded with pleasant but ineffective workers, including teachers and administrators. The kind of person who is eager to share the excitement of innovative and intellectual pioneering in multidisciplinary fields relevant to education and pedagogy is needed. Therefore, effective teachers and instructional leaders are needed for promoting primary students' creative thinking skills in science teaching.

Significance of the Research

To keep abreast with the information age, creative thinking skills are viewed as crucial for educated persons to cope with the rapidly changing world. Information is expanding at such a rate that individuals require transferable skills to enable them to address different problems in different contexts at different times throughout their lives. According to Gough (1991), many educators believe that specific knowledge will not be as important to tomorrow's workers and citizens as the ability to learn and make sense of new information.

Moreover, countries across the world are recognizing that a broad range of competencies are needed to prepare children for an unpredictable future. According to Dr. Khin Zaw (2001), through thought man can not only

make some sound predictions of what the future is to bring but he can cope with the new. Not establishing innovative skills at the elementary level can damage a child's creative potential and hinder their success in future endeavors (Robinson, 2006). Therefore, developing creative skills is crucial to education.

Therefore, it is necessarily important to produce the creative thinkers in Myanmar. Until now, there has not been enough educational support to educate children who have high creativity and special talents in schools and they have been neglected. It also needs to be considered about their latent ability and creativity that should be developed and supported. In order to do so, first, it is needed to develop an instructional leadership model for promoting students' creative thinking skills.

Theoretical Framework

This research work was guided by following theoretical framework. In this study, six dimensions of instructional leadership are as follows.

Encouraging teachers to build a creative environment: To promote creativity, the instructional leaders encourage science teachers to build a creative environment that includes emotional environment and physical environment. The emotional environment are has a relaxed, comfortable, open and non-threatening atmosphere. In the physical environment, things that reflect students' learning are displayed throughout the classroom. Moreover, the instructional leaders have to recognize and praise teachers who can build the creative classroom environment.

Reinforcing teachers to apply various teaching styles: The instructional leaders need to reinforce science teachers to use classroom activities such as brainstorming, thumbnail sketches, matrixes, small group, direct analogy, synectics, attribute listing, new uses, question stem, changing words, creating a product and silent demonstration.

Encouraging teachers to apply assessment strategies: The instructional leaders encourage science teachers to use of journals, open-ended problems, portfolios, interviews and performance assessment as measurements. To promote creativity, instructional leaders can give feedback. Giving praise is

also important for promoting creativity. The instructional leaders need to reward the creative behaviours of science teachers and students and be respectful of unusual questions and opposing ideas.

Encouraging teachers to enhance good teacher-student interactions: Good teacher-student interactions are necessary for promoting creativity. Therefore, the instructional leaders encourage science teachers to interact with students friendly. Moreover, the instructional leaders reinforce science teachers to become a good communicator and a good listener. In order to promote creativity, the instructional leaders give suggestions that science teachers must allow students to make suggestions freely.

Providing adequate teaching learning materials for the teachers: To promote creativity, the instructional leaders and science teachers should provide an abundant supply of interesting and useful materials, make students ease of resources access and communication with other sources, receive new technology in time and provide books on creativity.

Providing opportunities to develop knowledge concerning with creative thinking for the teachers: The instructional leaders need to invite professionals from other institutions to impart their knowledge to students and science teachers, invite experts to give talks to students and science teachers on the importance of creative thinking in society and make science teachers promote creative education through talks, seminars and courses. Reflective writing and discussion allow science teachers to develop ideas that can be integrated into their evolving personal pedagogy and professional practice.

Aims of the Research

Main Aim

The main aim of this study is to develop an instructional leadership model for promoting primary students' creative thinking skills.

Specific Aims

The specific aims are as follows:

(1) To study the level of lower primary school students' creative thinking skills.

(2) To study the relationship between the perceptions of principals and science subject leaders on knowledge and performance of instructional leadership for promoting primary students' creative thinking skills.

(3) To investigate the variations of knowledge and performance of principals and science subject leaders for promoting primary students' creative thinking skills in terms of their personal and school related factors.

(4) To study the relationship between the perceptions of lower primary school teachers on knowledge and performance of teaching practices for promoting primary students' creative thinking skills.

(5) To investigate the variations of knowledge and performance of lower primary school teachers for promoting primary students' creative thinking skills in terms of their personal and school related factors.

(6) To develop the validated instructional leadership model for promoting primary students' creative thinking skills.

Research Questions

Based on the specific aims, this study is mainly targeted on the following research questions.

(1) What are the levels of lower primary school students' creative thinking skills?

(2) Is there any significant relationship between the perceptions of principals and science subject leaders on knowledge and performance of instructional leadership for promoting primary students' creative thinking skills?

(3) What are the variations of knowledge and performance of principals and science subject leaders on instructional leadership for promoting primary students' creative thinking skills in terms of their personal and school related factors?

(4) Is there any significant relationship between the perceptions of lower primary school teachers on knowledge about teaching practices for promoting primary students' creative thinking skills and their actual performance?

(5) What are the variations of knowledge and performance of lower primary school teachers for promoting primary students' creative thinking skills in terms of their personal and school related factors?

(6) What is the instructional leadership model for promoting primary students' creative thinking skills?

Definition of Key Terms

The concepts underlying the development of the investigation are carefully defined as the important terms.

(1) **Instructional Leadership** is predicated on the assumption that teachers and principals need to work together as colleagues to improve teaching and learning in schools (Hoy & Hoy, 2006).

(2) **Teaching Practices** influence on student learning which are related to effective classroom learning and student outcomes (Brophy and Good, 1986; Wang, Haertel and Walberg, 1993, cited in Teaching and learning international study (TALIS), 2009).

(3) **Creative Thinking** is a novel way of seeing or doing things that is characterized by four components: fluency (generating many ideas), flexibility (shifting perspective easily), originality (conceiving of something new) and elaboration (building on other ideas) (Alvino, 1990, cited in Cotton, 1991).

Limitations of the Study

This study was concerned only with the instructional leadership of principals and science subject leaders, teaching practices of lower primary school teachers and creative thinking skills of lower primary school students from selected schools in Yangon Region.

Operational Definition

In this study, instructional leadership is the actions taken by the principals and science subject leaders that need to work with lower primary school teachers for promoting primary students' creative thinking skills in teaching natural science. Perceived instructional leadership was examined by the mean responses of principals and science subject leaders from Basic Education Schools on five-point Likert-scale questionnaire consisting of fifty-

three items. The higher the mean values of responses, the greater the level of perceived instructional leadership.

Review of Related Literature

A review of related literature deals with two main parts: (1) creative thinking, (2) teaching science and (3) instructional leadership.

Creative Thinking

Definitions of creativity are not straightforward, and many writers have contributed to the debate about what constitutes creativity, often hotly contesting different views. According to Marrapodi (2003), creative thinking is about expansion of ideas. According to Lee (2005), people engage in unique thinking because of intrinsic desire to find new and better things. This is called creative thinking. According to Alvino (1990, cited in Cotton, 1991), creative thinking is divergent thinking. It generates something new or different. It involves having a different idea that works as well or better than previous ideas.

Moreover, Gardner (1988) argued that truly creative people are those who make a difference to the world. He believes each child, by the age of 7, has developed a capital of creativity upon which they subsequently draw throughout their adult lives. Moreover, Alvino (1990, cited in Cotton, 1991), creative thinking is a novel way of seeing or doing things that is characterized by four components: fluency (generating many ideas), flexibility (shifting perspective easily), originality (conceiving of something new) and elaboration (building on other ideas). There is no guarantee that children think creatively even if they have creative ability. Creative behaviours may not be generated if children fear new thinking or do not want to be creative. According to Lee (2005), characteristics related to creative behaviours are curiosity, run-a-risk, independence and task commitment. According to Amabile (1992, cited in Adams, 2005), as depicted in Figure 1, creativity arises through the confluence of the three components: Knowledge, Creative Thinking and Motivation.

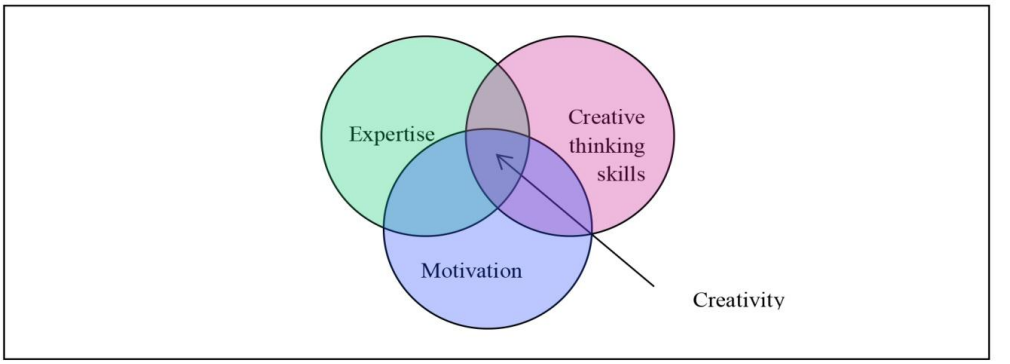

Figure 1: Three Components of Creativity
Source: Adams, K. (2005). *The Sources of Innovation and Creativity.*

Teaching Science

According to Macdonald (1972, cited in Wilson, 2010), creativity is concerned with bringing into being or making something new. This definition can be applied to science with ease. Learning about scientists and their discoveries can help develop better understanding about the nature of science and scientific discoveries. Creative science education is active and child-centered, involving individual problem-solving and exploration. Hicks (2002, cited in Wilson, 2010) stated that features of good practice in creative science teaching and learning are Clarity of focus, Emphasize questioning and enquiries, Teaching approaches, Focus on children doing the thinking, Evaluating learning and Connecting with personal futures.

Instructional Leadership

A critical role for all principals is that of instructional leaders. According to Hoy and Hoy (2006), instructional leadership is predicated on the assumption that teachers and principals need to work together as colleagues to improve teaching and learning in schools. According to Lineburg (2010), principals' instructional leadership strategies are communicating goals, supervising instruction, promoting professional development, providing resources and providing incentives.

In the instructional leadership model of Blase and Blase (1999), effective principal's instructional leadership consists of the two major themes:

Talking with teachers to promote reflection and Promoting professional growth. Tsai (2013) proposed the model that include knowledge, creative thinking, motivation and self-efficacy, goal setting and work group, transformational leadership, and supportive leadership. Mellou (1996, cited in Sharp, 2004) suggests that young children's creativity can be nurtured through educational settings in three respects: the creative environment, creative programmes and creative teachers and ways of teaching. According to Cole et al., (n.d.), four areas as important characteristics of the supportive environment for fostering creativity are: personal teacher-student relationship, assessment, openness and freedom of choice, and classroom activities.

Methodology

In this study, quantitative and qualitative research methods were used. A set of questionnaire to collect the data concerning with the students' creative thinking skills was developed based on the Alternative Uses Test developed by Guilford (1967). Other three sets of questionnaires to collect the required data were developed based on the literature. The reliability coefficient (Cronbach α) was 0.76 for of Guilford's test, 0.88 for students' creative behaviours questionnaire, 0.98 for instructional leadership questionnaire and 0.98 for science teaching practice questionnaire.

Cluster sampling method was used. Forty seven science subject leaders, forty two primary school principals, eighteen middle school principals, fifteen high school principals, four hundred and eighty two lower primary school teachers and two hundred and forty lower primary school students in Yangon Region participated in this study. The descriptive statistics was used to analyze the collected data. Moreover, One-Way ANOVA, Tukey HSD test, the Pearson-product moment correlation coefficient, Simple linear regression and Simultaneous multiple regression were utilized.

Findings

Findings for Research Question (1)

The Perceived Level of Creative thinking Skills of Lower Primary Students in terms of their Creative Behaviours rated by Lower Primary School Teachers

According to the Table 1, it can be said that the perceived level of creative thinking skills of students is moderately high.

Table 1: Mean Values and Standard Deviations Showing Lower Primary School Teachers' Perceptions on Creative Thinking Skills of Their Lower Primary School Students

Variable	Mean	SD
perceived level of creative thinking skills of lower primary school students	2.60	0.48

Scoring Direction: 1.00-1.49=low 1.50-2.49=moderately low
2.50-3.49=moderately high 3.50-4.00=high

The Level of Creative Thinking Skills of Lower Primary Students measured by Guilford's Alternative Uses Test

In Table 2, the lower primary school students in District D possessed the highest mean ($\overline{X}$=2.96). Thus, among four groups of lower primary school students, it is assumed that the level of creative thinking skills of the students in District D from the selected schools is the highest.

Table 2: Mean Values Showing Level of Creative Thinking Skills of Students grouped by District (N=240)

District	Perceived Level of Creative Thinking Skills	
	Mean	**SD**
District A	2.73	1.05
District B	2.42	1.19
District C	2.87	1.38
District D	2.96	0.84

Findings for Research Question (2)

The Relationship between the Perceptions of Principals and Science Subject Leaders on Knowledge and their Actual Performance of Instructional Leadership

Table 3: Correlation between Principals and Science Subject Leaders' Perception on Knowledge and their Actual Practices of Instructional Leadership

Dimensions	Pearson Correlation	Sig. (2-ailed)	Direction of Relationship	Strength of Relationship
E	.42**	.000	Positive	Moderate
TS	.51**	.000	Positive	Moderate
AS	.31**	.001	Positive	Low
I	.37**	.000	Positive	Moderate
TM	.37**	.000	Positive	Moderate
K	.42**	.000	Positive	Moderate
Overall	.38**	.000	Positive	Moderate

***P<0.01*

E = Encouraging teachers to build a creative environment
TS = Reinforcing teachers to apply various teaching styles
AS = Encouraging teachers to apply assessment strategies
I = Encouraging teachers to enhance good teacher-student interactions
TM = Providing adequate teaching learning materials for the teachers
K = Providing opportunities to develop knowledge concerning with creative thinking for the teachers

As shown in Table 3, it was found that there was a significant relationship in overall dimensions between the perceived level of knowledge and performance on six dimensions of instructional leadership rated by the principals and science subject leaders, r=.38, p< .01. The finding also showed moderate, positive direction of relationship between the principals and science subject leaders' perceptions on knowledge and actual performance of instructional leadership.

Findings for Research Question (3)

The Variations of Perceptions of Principals and Science Subject Leaders on Knowledge of Instructional Leadership for Promoting Primary Students' Creative Thinking Skills in terms of their Personal And School Related Factors

According to Table 4, the level of perceptions of principals and science subject leaders on knowledge of instructional leadership for all four groups is moderately high.

Table 4: Mean Values and Standard Deviations Showing Perceptions of Principals and Science Subject Leaders on Knowledge for Instructional Leadership grouped by School Level (N=122)

School Level	Mean	SD	Remark
Primary School	4.08	0.38	Moderately High
Middle School	4.07	0.30	Moderately High
High School	3.98	0.43	Moderately High

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 the Table 5, statistically significant differences were found among the group of principals and science subject leaders in primary schools, the group of principals and science subject leaders in middle schools and the group of principals and science subject leaders in high schools in the perceived level of knowledge of *encouraging teachers to build a creative environment* ($F(2,119)=5.31$, $p< .01$).

Table 5: One-Way ANOVA Result Showing Significantly Different Areas in Principals and Science Subject Leaders' Perceptions on Knowledge for Instructional Leadership grouped by School Level

Dimensions		Sum of Squares	*df*	Mean Square	*F*	*P*
Encouraging teachers to build a creative environment	Between Groups	1.45	2	0.72	5.31	0.006
	Within Groups	16.21	119	0.14		
	Total	17.65	121			
Reinforcing teachers to apply various teaching styles	Between Groups	0.41	2	0.21	1.26	n.s
	Within Groups	19.54	119	0.16		
	Total	19.95	121			
Encouraging teachers to apply assessment strategies	Between Groups	0.19	2	0.10	0.40	n.s
	Within Groups	28.47	119	0.24		
	Total	28.66	121			
Encouraging teachers to enhance good teacher-student interactions	Between Groups	0.14	2	0.07	0.28	n.s
	Within Groups	29.97	119	0.25		
	Total	30.11	121			
Providing adequate teaching learning materials for the teachers	Between Groups	0.41	2	0.21	1.06	n.s
	Within Groups	23.01	119	0.19		
	Total	23.42	121			

Dimensions		Sum of Squares	*df*	Mean Square	*F*	*P*
Providing opportunities to develop knowledge concerning with creative thinking for the teachers	Between Groups	0.23	2	0.11	0.33	n.s
	Within Groups	41.04	119	0.34		
	Total	41.27	121			
Overall	Between Groups	0.22	2	0.11	0.78	n.s
	Within Groups	16.67	119	0.14		
	Total	16.89	121			

n.s = no significance

Table 6: Tukey HSD Showing Multiple Comparisons for Significantly Different Areas in Principals and Science Subject Leaders' Perceptions on Knowledge for Instructional Leadership grouped by School Level

Dimension	(I) School Level	(J) School Level	Mean Difference (I-J)	*p*
Encouraging teachers to build a creative environment	Primary School	Middle School	.08	n.s
		High School	.27**	.000
	Middle School	High School	.19	n.s

Note: **. The mean difference is significant at the 0.01 level. n.s = no significance

As shown in Table 6, Post hoc Tukey HSD indicates that the group of principals and science subject leaders in primary schools and the group of principals and science subject leaders in high schools significantly differed in the perceived level of knowledge of *encouraging teachers to build a creative environment* among principals and science subject leaders grouped by school level (p <0.01, d=0.33).

The Variations of Perceived Level of Performance of Principals and Science Subject Leaders on Instructional Leadership for Promoting Primary Students' Creative Thinking Skills in terms of their Personal and School Related Factors

According to Table 7, the level of perceptions of principals and science subject leaders on performance of instructional leadership for all three groups is moderately high.

Table 7: Mean Values and Standard Deviations Showing Perceived Level of Performance of Principals and Science Subject Leaders grouped by School Level (N=122)

School Level	Mean	SD	Remark
Primary	3.91	0.46	Moderately High
Middle School	3.61	0.78	Moderately High
High School	3.63	0.59	Moderately High

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 the Table 8, there was a significant difference on the perceived level of performance in *overall area of instructional leadership* among the school level *(F*(2,119)=3.39, *p*< .05).

Table 8: One-Way ANOVA Result Showing Significantly Different Areas in the Perceived Level of Performance of Principals and Science Subject Leaders grouped by School Level

Dimensions		**Sum of Squares**	***df***	**Mean Square**	***F***	***P***
Encouraging teachers to build a creative environment	Between Groups	2.62	2	1.31	3.29	0.041
	Within Groups	47.37	119	0.40		
	Total	49.99	121			
Reinforcing teachers to apply various teaching styles	Between Groups	4.08	2	2.04	4.91	0.009
	Within Groups	49.44	119	0.42		
	Total	53.52	121			
Encouraging teachers to apply assessment strategies	Between Groups	3.01	2	1.51	2.66	n.s
	Within Groups	67.44	119	0.57		
	Total	70.45	121			
Encouraging teachers to enhance good teacher-student interactions	Between Groups	4.36	2	2.18	4.29	0.016
	Within Groups	60.46	119	0.51		
	Total	64.82	121			
Providing adequate teaching learning materials for the teachers	Between Groups	2.92	2	1.46	2.55	n.s
	Within Groups	68.07	119	0.57		
	Total	70.99	121			

Dimensions		**Sum of Squares**	***df***	**Mean Square**	***F***	***P***
Providing opportunities to develop knowledge concerning with creative thinking for the teachers	Between Groups	0.62	2	0.31	0.45	n.s
	Within Groups	82.17	119	0.69		
	Total	82.80	121			
Overall	Between Groups	2.53	2	1.27	3.39	0.037
	Within Groups	44.37	119	0.37		
	Total	46.90	121			

n.s = no significance

Table 9: Tukey HSD Showing Multiple Comparisons for Significantly Different Areas in Perceived Level of Performance of Principals and Science Subject Leaders grouped by School Level

Dimensions	**(I) School**	**(J) School**	**Mean**	***p***
Encouraging teachers to build a creative environment	Primary School	Middle	.25	n.s
		High School	.34*	.018
	Middle	High School	.09	n.s
Reinforcing teachers to apply various teaching styles	Primary School	Middle	.39*	.024
		High School	.36*	.027
	Middle	High School	-.03	n.s
Encouraging teachers to enhance good teacher-student	Primary School	Middle	.33	n.s
		High School	.43*	.020
	Middle	High School	.11	n.s
Overall	Primary School	Middle	.30*	.023
		High School	.28*	.040
	Middle	High School	-.02	n.s.

Note: *. The mean difference is significant at the 0.05 level. n.s = no significance

In Table 9, Post hoc Tukey HSD indicates that in the area of *overall area of instructional leadership*, group of principals and science subject leaders in primary schools significantly differed with both the group of principals and science subject leaders in middle schools (p <0.05, d=0.48) and the group of principals and science subject leaders in high schools (p <0.05, d=0.53).

Findings for Research Question (4)

The Relationship between Lower Primary School Teachers' Perception on Knowledge and their Actual Performance of Teaching Practices for Promoting Primary Students' Creative Thinking Skills

As shown in Table 10, it was found that there was a significant relationship in overall dimensions between the perceived level of knowledge and performance on six dimensions of teaching practices rated by the lower primary school teachers, r=.57, p< .01. The finding also showed moderate, positive direction of relationship between the lower primary school teachers' perceptions on knowledge and actual performance of teaching practices.

Table 10: Correlation between Lower Primary School Teachers' Perception on the Knowledge and their Actual Performance of Teaching Practices (N=482)

Dimensions	Pearson Correlation	Sig. (2-tailed)	Direction of Relationship	Strength of Relationshi
TE	.383**	.000	Positive	Moderate
TTS	.581**	.000	Positive	Moderate
TAS	.583**	.001	Positive	Moderate
TI	.572**	.000	Positive	Moderate
TTM	.573**	.000	Positive	Moderate
TK	.509**	.000	Positive	Moderate
Overall	.569**	.000	Positive	Moderate

****p < .01.**

TE = Building a creative environment
TTS = Applying various teaching styles
TAS = Applying assessment strategies
TI = Enhancing good teacher-student interactions
TTM = Applying teaching learning materials
TK = Having opportunities to develop knowledge concerning with creative thinking

Findings for Research Question (5)

The Variations of Perceptions of Lower Primary School Teachers on Knowledge of Teaching Practices for Promoting Primary Students' Creative Thinking Skills in terms of their Personal and School Related Factors

As shown in Table 11, there were significant differences between the group of primary teachers (PT) and the group of junior teachers (JT) in *building a creative environment* ($t(480) = 2.30$, $p<0.05$, $d=0.20$) and in *having opportunities to develop knowledge concerning with creative thinking* ($t(480) = 2.04$, $p<0.05$, $d=0.19$). Inspection of two group means indicated that the mean ratings of the group of primary teachers were higher than those of the group of junior teachers especially in these areas.

Table 11: Independent Samples *t* Test Result Showing Mean Values of Perceptions of Lower Primary School Teachers on Knowledge for Teaching Practices Grouped by Position

Dimensions	Group	Mean	SD	*t*	*df*	*p*
Building a creative environment	PT JT	4.10 4.01	0.42 0.47	2.30	480	.022
Applying various teaching styles	PT JT	4.13 4.07	0.44 0.51	1.46	480	n.s
Applying assessment strategies	PT JT	4.18 4.15	0.55 0.49	.43	415.24	n.s
Enhancing good teacher-student interactions	PT JT	4.23 4.22	0.59 0.48	.18	480	n.s
Applying teaching learning materials	PT JT	3.85 3.80	0.58 0.52	1.03	480	n.s
Having opportunities to develop knowledge	PT JT	3.97 3.85	0.61 0.63	2.04	480	.042
Overall	PT JT	4.08 4.10	0.43 0.42	1.55	480	n.s

Note: n.s = no significance

The Variations of Perceived Level of Performance of Lower Primary School Teachers on Teaching Practices for Promoting Primary Students' Creative Thinking Skills in terms of their Personal and School Related Factors

As shown in Table 12, there were significant differences between the group of primary teachers (PT) and the group of junior teachers (JT) in *having opportunities to develop knowledge concerning with creative thinking* ($t(480) = 1.97$, $p<0.05$, $d=0.19$). Inspection of two group means indicated that the mean ratings of the group of primary teachers were higher than those of the group of junior teachers especially in these areas.

Table 12: Independent Samples t Test Result Showing Mean Values of Perceptions of Lower Primary School Teachers on Performance of Teaching Practices Grouped by Position

Dimensions	Gro	Me	SD	*t*	*df*	*p*
Building a creative environment	PT JT	3.9 3.8	0.6 0.7	1.26	480	n.s
Applying various teaching styles	PT JT	4.0 3.9	0.6 0.6	0.74	480	n.s
Applying assessment strategies	PT JT	4.0 4.0	0.7 0.7	0.92	480	n.s
Enhancing good teacher-student interactions	PT JT	4.2 4.2	0.6 0.6	0.32	480	n.s
Applying teaching learning materials	PT JT	3.6 3.5	0.6 0.7	0.29	480	n.s
Having opportunities to develop knowledge concerning	PT JT	3.4 3.3	0.7 0.8	1.97	480	.049
Overall	PT JT	3.9 3.8	0.5 0.5	1.16	480	n.s

n.s = no significance

Findings for Research Question (6)

The Potential Factors affecting Lower Primary School Students' Creative Thinking Skills

The Beta coefficients were presented in Table 13. Level of lower primary school students creative thinking skills perceived by lower primary school teachers ($\beta=.30$, $p<.05$) appears to be the predictor of level of lower primary school students' creative thinking skills in Guilford's test and vice versa.

Table 13: Simple Linear Regression Analysis for Level of Lower Primary School Students' Creative Thinking Skills Perceived by Lower Primary School Teachers Predicting Level of Lower Primary School Students' Creative Thinking Skills Measured by Guilford's Test

Variables	*B*	Std. Error	*β*	*p*
TSCTS	.65	.32	.30*	.047
Constant	1.26	.86		
$R = .30$, $R^2 = .09$, $F(1,238) = 4.19$, $*p < .05$.				

TSCTS = Perceived level of students' creative thinking skills

Table 14: Simultaneous Multiple Regression Analysis on Instructional Leadership and Teaching Practices Predicting Perceived Level of Lower Primary School Students' Creative Thinking Skills rated by Lower Primary School Teachers

Variables	*B*	Std. Error	*β*	*p*
OHK	.17	.10	.15	n.s
OHP	-.08	.06	-.12	n.s
OTK	.40	.11	.34*	.050
OTP	.12	.06	.38**	.001
Constant	.18	.59		
$R = .48$, $R^2 = .23$, $F(4,477) = 8.95$, $*p < .05$, $**p < .01$.				

OHK = Principals and science subject leaders' knowledge for instructional leadership

OHP = Principals and science subject leaders' performance on instructional leadership

OTK = Lower primary school teachers' knowledge for teaching practices

OTP = Lower primary school teachers' performance on teaching practices

The Beta coefficients were presented in Table 14. According to β weights, performance of lower primary school teachers on teaching practices (β =.38, p<.01) appears to be the best predictor of lower primary school students' creative thinking skills rated by lower primary school teachers. Knowledge of lower primary school teachers on teaching practices (β=.34, p<.05) appears to be the second best predictor of lower primary school students' creative thinking skills rated by lower primary school teachers.

The Regression Equation is:
Lower primary school students' creative thinking skills rated by lower primary school teachers = .18+.17OHK + .08OHP + .40OTK + .12OTP

Model Validation

In the model validation, there were thirty three participants. They all agreed that all the components, namely instructional leaders' knowledge, instructional leaders' performance, teachers' knowledge, teachers' performance and students' creative thinking skills should be included in instructional leadership model.

All the responses given were analyzed to know the applicability of the model for promoting primary students' creative thinking skills. Most of the respondents mentioned that this instructional leadership model can be used in educational setting.

Based on the findings, the review of relevant literature and expert validation, a developed instructional leadership model for promoting primary students' creative thinking skills in teaching natural science at lower primary level was illustrated (See Figure 2).

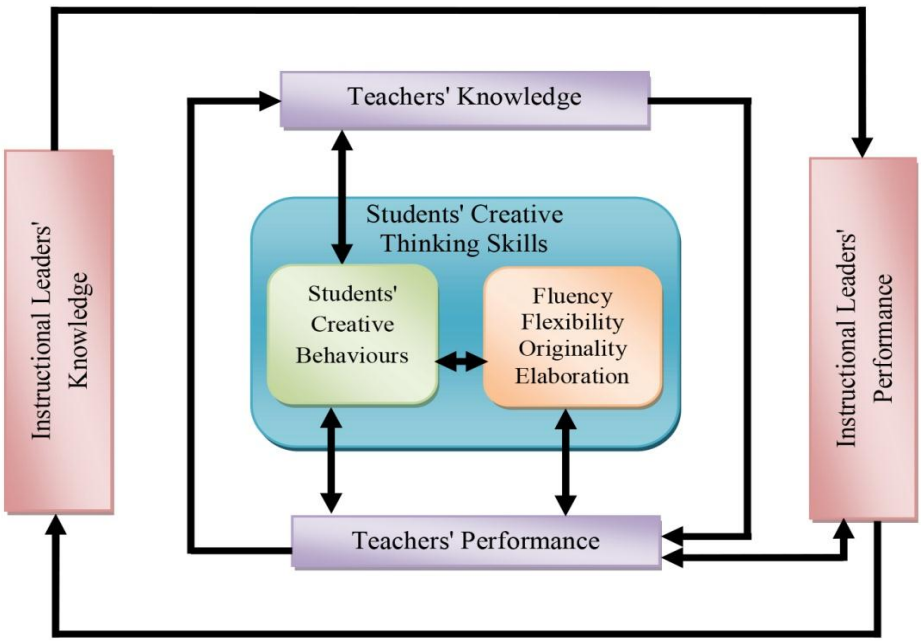

Figure 2: Developed Instructional Leadership Model for Promoting Primary Students' Creative Thinking Skills

Note:

Dimensions of Instructional Leadership for Instructional Leaders' Knowledge and Performance

1. Encouraging teachers to build a creative environment
2. Reinforcing teachers to apply various teaching styles
3. Encouraging teachers to apply assessment strategies
4. Encouraging teachers to enhance good teacher-student interactions
5. Providing adequate teaching learning materials for the teachers
6. Providing opportunities to develop knowledge concerning with creative thinking for the teachers

Dimensions of Teaching Practices for Teachers' Knowledge and Performance

1. Building a creative environment
2. Applying various teaching styles
3. Applying assessment strategies
4. Enhancing good teacher-student interactions
5. Applying teaching learning materials
6. Having opportunities to develop knowledge concerning with creative thinking

Recommendation

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

- School principals should encourage teachers to make the classrooms become a place where the students are happy, comfortable and talk about their ideas freely.
- School principals should encourage teachers to connect with subject content to real-world situations.
- School principals should provide material support and financial support to the teachers in making teaching learning materials.
- School principals should provide opportunities for staff development.
- School principals should encourage teachers to use the performance assessment and portfolios in all classes.
- School principals should encourage teachers to use student-centred approach such as small group, open-ended questions, problem-solving, question stem, observation, brainstorming, discussion, activity-based learning and demonstration in providing chances for students to think, learn and discover.
- School principals should encourage teachers to listen carefully when students talked about their problems.
- School principals should encourage teachers to answer respectfully when students asked unusual questions.
- School principals and teachers should work cooperatively and deliberately to promote the students' creative thinking skills.

Need for Further Research

The studies at all levels of institutions need to be conducted to investigate how to give instructional leadership for promoting students' creative thinking skills.

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AN ANALYSIS OF THE IMPACT OF PROBLEM-BASED LEARNING ON GRADE-6 STUDENTS' METACOGNITIVE SKILLS*

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Abstract

This study was designed to investigate the impact of problem-based learning on metacognitive skills of Grade-6 students. For this purpose, pretest-posttest design, without control group, was used in this study. The research group of the study was comprised of forty eight Grade-6 students who studied at the Practicing Middle School, Hlegu Education College, Yangon Region, in 2017-2018 Academic Year. Seven learning stages of problem-based learning process were carried out on the experimental group for a period of over 40 hours. Four problems developed from Chapter-5 (Earth and Space) from Grade-6 General Science Textbook were used as an intervention procedure. For quantitative data collection, Metacognitive Skills Inventory (MSI) which consists of 40 items and 2 factors was used. Before any intervention, participants of this study was completed Metacognitive Skills Inventory. Then, the participants worked through developed four problems within seven learning stages of problem-based learning process. After the intervention, students completed the same Metacognitive Skills Inventory for a second time. Two dependent sample t-test was used for pretest and post-test comparisons. Results showed that students performed better in post-test. It has been concluded that the learning stages of problem-based learning process had an impact on the metacognitive skills of Grade-6 students.

Keyword: Problem-Based Learning, Metacognitive Skills

Introduction

Good pedagogy today is about making students' thinking visible. The challenge of education is to design learning environments where students' ways of thinking and knowing are manifested in active, collaborative, self-regulated, and self-directed learning. Problem-Based Learning pedagogy can be a way to provide students with opportunities to develop deep understandings of knowledge and produce qualities such as imagination and creativity, ability to work in groups, communication and information finding

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skills, problem solving abilities, technological literacy, and a readiness to learn. In this respect, it is important for students to be prepared for the future by facing real or real-like problems in their learning environment and producing appropriate solutions to these problems.

If one aim of schooling is to prepare children to be lifelong learners, then it is important to help students become aware of themselves as learners and to take control of their own activities. According to Eggen and Kauchak (1996), metacognition is the awareness and control of cognitive processes. Simply put, metacognition means "thinking about one's own thinking." There are two aspects of metacognition: reflection: thinking about what we know; and self-regulation: managing how we go about learning. Developing metacognitive abilities is not simply about becoming reflective learners, but about acquiring specific learning strategies as well. Swanson (1992) described that the better the individuals control and monitor the strategies they use, the more their problem solving ability improves. Students often lack these skills or fail to recognize when to use them (Flavell & Wellman, 1977). So, the knowledge of individuals regarding their thinking process and strategies and their abilities to monitor and organize these processes has become important.

Research has also shown that one of the key traits good problem-solvers possess is highly developed metacognitive skills. They know how to recognize flaws or gaps in their own thinking, articulate their thought processes, and revise their efforts (Brown, Bransford, Ferrara, & Campione, 1983). Only developing metacognitive skills decide the strengths and weaknesses in learning. No other skills direct the own learning except metacognitive skills. So, as educators, it is important to help to foster the development of metacognitive skills in students which are the essential skills that will help students learn "how to learn." For these reasons above, the present study investigates problem-based learning on student's metacognitive skills. For this, this study attempts how impact of problem-based learning on Grade-6 students' metacognitive skills.

Literature Review

Overview Problem-Based Learning

Problem-based learning (PBL) is an instructional approach that has been used successfully for over 30 years and continues to gain acceptance in multiple disciplines. It is an instructional learner-centered approach that empowers learners to conduct research, integrate theory and practice, and apply knowledge and skills to develop a viable solution to a defined problem. Savery (1996). Boud and Feletti (1997) stated PBL that it is generally known today evolved from innovative health sciences curricula introduced in North America over 30 years ago. Medical faculty at McMaster University in Canada introduced the tutorial process, not only as a specific instructional method (Barrows &Tamblyn, 1980) but also as central to their philosophy for structuring an entire curriculum promoting student-centered, multidisciplinary education, and lifelong learning in professional practice.

Hmelo-Silver (2004) described PBL as an instructional method in which students learn through facilitated problem solving that centers on a complex problem that does not have a single correct answer. She noted that students' work in collaborative groups to identify what they need to learn in order to solve a problem in self-directed learning, apply their new knowledge to the problem, and reflect on what they learned and the effectiveness of the strategies employed.

On the website for the PBL Initiative (http://www.pbli.org/pbl/generic _pbl.htm), Barrows (n.d.) described in detail a set of Generic PBL. Each of these essential characteristics has been briefly provided as additional information and resources.

- Students must have the responsibility for their own learning.
- The problem simulations used in problem-based learning must be ill-structured and allow for free inquiry.
- Learning should be integrated from a wide range of disciplines or subjects.
- Collaboration is essential.
- What students learn during their self-directed learning must be applied back to the problem with reanalysis and resolution

- A closing analysis of what has been learned from work with the problem and a discussion of what concepts and principles have been learned is essential.
- Self and peer assessment should be carried out at the completion of each problem and at the end of every curricular unit.
- Student examinations must measure student progress toward the goals of problem- based learning.
- Problem-based learning must be the pedagogical base in the curriculum and not part of a didactic curriculum.

These descriptions of the characteristics of PBL identify clearly the role of the tutor as a facilitator of learning, the responsibilities of the learners to be self-directed and self-regulated in their learning, the essential elements in the design of ill-structured instructional problems as the driving force for inquiry. If teaching with PBL were as simple as presenting the learners with a 'problem' and students could be relied upon to work consistently at a high level of cognitive self-monitoring and self-regulation then many teachers would be taking early retirement. The reality is that learners who are new to PBL require significant instructional scaffolding to support the development of problem-solving skills, self-directed learning skills, and teamwork/ collaboration skills to a level of self-sufficiency where the scaffolds can be removed. Teaching institutions that have adopted a PBL approach to curriculum and instruction have developed extensive tutor training programs in recognition of the critical importance of this role in facilitating the PBL learning experience.

The Role of Reflection in Problem-Based Learning

Shermis (1999) defines a problem as a situation where a student is 'curious, puzzled, confused or unable to resolve an issue'. The PBL teachers should stop at times during the process and allow students to reflect on how and what they have learned so far. The teacher should encourage his or her students to reflect on the processes involved in understanding the content as well as how they performed as team members and how they have contributed to the group's work (Engels, 1999). Reflection on solving problems can help

to develop the skills as well as the habits and disposition to use them. So, reflection is regarded as an integral part of problem-based learning where problems drive the learning.

Overview of Metacognition

According to Schraw & Moshman (1995), "metacognition includes two main sub components generally referred to as knowledge of cognition and regulation of cognition." Knowledge of cognition refers to what we know about our cognition, and may be considered to include three subcomponents. The first, declarative knowledge (knowing what factors influence human cognition), includes knowledge about ourselves as learners and what factors influence our performance. The second, procedural knowledge (knowing how certain skills work and how they should be applied), in contrast, refers to knowledge about strategies and other procedures. Finally, conditional knowledge (knowing when certain strategies are needed and why they influence cognition) includes knowledge of why and when to use a particular strategy. Individuals with a high degree of conditional knowledge are better able to assess the demands of a specific learning situation and, in turn, select strategies that are most appropriate for that activity.

On the other hand, regulation of cognition typically includes at least three components, planning, monitoring, and evaluation. Planning involves the selection of appropriate strategies and the allocation of resources. Monitoring includes the self-testing skills necessary to control learning. Evaluation refers to appraising the products and a regulatory process of one's learning. It makes children in the classroom evaluate their performance and compare task performance with people and use the final result in locating the error in the solution process (Lucangeli et al., 1998). Thus, metacognitive regulation includes planning, monitoring and evaluating the learning as well as learning process.

Metacognitive Skill

Brown (1980) referred to the component of metacognition as executive control processes, which included planning, monitoring, and evaluation of an individual's cognitive and affective functioning. With

planning strategies, a learner plans one's use of cognitive strategies, such as activating prior knowledge, organizing the material to be read, and so on, whereas metacognitive activities refer to the monitoring of comprehension when learners check their understanding against some self- or other-set goals. The monitoring process suggests the need for a regulation process. This suggests that a metacognitive skill includes knowledge of cognition and regulation of cognition.

When students use declarative, procedural and conditional knowledge and planning, monitoring and evaluating they are said to be consciously engaged in using metacognitive skills. On the other hand, metacognitive skills will also become automatic without much conscious awareness resulting from practice and habitual use (e.g., Schneider & Pressley, 1989), and it will become conscious mainly in new or difficult situations.

Methodology

Design of the Study

In the study, pre-test post-test design without control group was used. In this study, the effect of experimental procedure is tested on a single group and the measurements of the subjects regarding the dependent variable are acquired via pre-test before the intervention and post-test after the intervention by using the same subjects and the same assessment instrument. There is no randomness as well as matching and in this regard, the design can be described a pre-test measure followed by a treatment and then a posttest for a single group.

Sample of the Study

A total of 48 Grade-6 students, as participants of this study, were from Practising Middle School, Hlegu Education College, Yangon Region during 2017-2018 Academic Year. The sampling method chosen for the study was nonprobability sampling. Quantitative research data were collected by using purposeful sampling and convenience sampling methods, which are among the nonprobability methods.

Instrumentation

The researcher wanted to study the metacognition quantitatively. For this purpose, the metacognitive skills inventory was prepared by the researcher to measure the metacognitive knowledge and metacognitive regulation of Grade-6 students while solving problems through PBL approach.

Firstly, researcher collected (85) items from Junior Metacognitive Awareness Inventory (Sperling, Howard, Miller, &Murphy, 2002), Problem Solving Questionnaire (Fortunato, 1990) and Metacognitive Activities Inventory (Cooper, M.,and Sandi-Urena, S. (2009). Then, experts' reviews were conducted for face validity and content validity from educational psychology field to know whether the students had difficulties regarding the understanding of the statement, the confusion regarding the type of response to be given, any confusion regarding the instruction given , the time taken during the response and was appropriate and relevant to Grade-6 students. After that, during the second week of November, pilot study was done with a total of 92 students from No (4), Basic Education High School, Hlaing. After piloting, (45) items were removed and remaining (40) items were selected, which were arranged according to the component of metacognition based on test item analysis results. The reliability co-efficient of MSI obtained through KR-21 formula was 0.80 which shows that it was a reliable tool for the data collection.

Four Problem Situations

Four problem situations were developed by the researcher herself based on the topic "Eleven environmental problems caused by humans activities" described in Grade-6 General Science Textbook. For this purposes, the researcher read and learned such related books about environmental studies as Environment Science Essentials (Level 1 through 6) published in 2015 @ Macaw Books, Environmental Studies (Level - 4) published in 2016 @ viva online learning , Cambridge Primary Science (Learner's Book and Activity Book Stage 4 and 6) written by Fiona Baxter, Liz Dilley and Alen Cross in 2015. , Interactive Science (Stage 4 and 6) written by Jhara Ro And Fighting Global Warming in Everyday life. Moreover, the researcher also

read the books such as First Encyclopedia of Seas and Oceans, Natural Environment, Wishing Our Mother Earth Clean and Green, Journal and Articles about Let's Save Our Natural Environment and other related books. Then, problem situations about air pollution and global warming, increasing waste disposal, deforestation and extinction of wild animals were developed. And then, experts' reviews were conducted for content validity from educational methodology field to know whether the developed problems were relevant to Grade-6 students.

Procedure

The research was conducted with a total of 48 Grade-6 students from Practising Middle School, Hlegu Education College, Yangon Region for over two months (from first week of December till the last week of January). Since this programme was of over forty hours, permission for duration of 10 weeks was taken from the Headmaster to solve all four PBL problems. PBL was implemented for three days a week.

Firstly, pre-test was administered to the students before any intervention. After the pre-test, the researcher started the Problem-Based Learning intervention procedure with the help of six research assistants who are from Hlegu Education College. Before each period of PBL intervention procedure, the researcher and all these facilitators had meetings to discuss how to proceed PBL. It took about 10 hours to introduce and train PBL and made sure all the students were familiar with PBL process and can do all the activities they will be assigned to do. After that, Problem-Based Learning was implemented with Seven Learning Stages which are (1) Introduce the Problem (2) Problem Analysis (3) Self-study (4) Group Analysis (5) Select the Most Feasible Solution (6) Present Findings (7) Evaluating Performance.

Learning Stage 1: Introduce the Problem

The first learning stage began with the introduction of the students with the ill-structured PBL problem before any instruction was given to students. Then, the researcher made the students into a small group formation about six groups of eight to do group discussion. Then, the handouts that contained all the learning stages of PBL, respective problem situations, guiding questions were given for all the students. Moreover, the teacher made

an explanation about the handouts. At this time, all the students had to listen carefully, follow the teacher's instructions and read about the handouts. At that time, they were allowed to ask questions if they were unclear about what they had to do in their learning process of PBL.

Then, the teacher delivered **Metacognitive Prompts Worksheet** to all the students before solving the problem and told them to ask **four planning questions** on their own which are **"What is the nature of the problem? What is our goal? What kind of information and strategies do we need? How much time and resources do we need?"** to set the plans before analyzing the problem. This was an individual activity. Then, they had to write all their answers in **Metacognitive Prompts Worksheet**. Then, students had to consult and discussed their ideas, opinions and answers about problems with their group members until they agreed upon them to identify the problem more definitively and establish the goals for problem clearly. Then, all the groups had to identify facts about the problem.

Learning Stage 2: Problem Analysis

In the second learning stage, the teacher gave **"Need-to-Know" Worksheet** to the all the groups of students to analyze the problems more deeply to separate the known facts from the unknown facts by eliciting their prior knowledge to solve the problem, identify their knowledge gaps. All the students in each group had to receive "**Need-to-know Worksheet"** and they had to list facts about what they already knew based on their previous knowledge and put all these known facts into **"What we know?"** column, one of the first columns in **"Need-to-know Worksheet.** At such time, when their previous knowledge was insufficient to solve the problem, they were allowed to gather necessary information and learned new concepts by getting the help from the teacher while they engaged in their problem solving activity. This was a group activity. At that time, the teacher made an observation of metacognitive aspects that will be shown in filling in the worksheet during their group discussion.

Then, the students had to formulate hypotheses in **"Generating Hypothesis"** column which is one of the columns in "**Need-to-know Worksheet"** about the nature of the problem including possible mechanisms

to make the students delve deeper into it. It can be assumed that if the students understood the problem better, they would generate more hypotheses about possible solutions. So, at this time, all the students had to identify their ideas and explanations into tentative solutions.

On the part of the teacher, the teacher also prompt new lines of thoughts by asking the metacognitive questions; like **"What are you thinking about? Have you got a hunch about something?"** to monitor the student learning and to scaffold while they were solving the problem and observed them carefully while thinking of the problem and trying to formulate hypotheses.

Once known facts were listed, students were asked to identify **"learning issues" or "questions"** that they wanted to know more which were unresolved, questions arising from issues, or knowledge deficiencies or knowledge gaps. During this activity, the teacher instructed the students in all the groups to list all these learning issues and put all these learning issues or questions into **"What we need to know?"** column, one of the columns in **"Need-to Know" Worksheet.**

During this time, the teacher observed all the groups' metacognitive behaviors and assessed them properly. Surely, all these questions or learning issues will surely drive the next stage of the PBL process and served as guidelines for independent and self-directed learning. Self-directed learning is a distinguishing feature of PBL. During self-directed learning, the students were asked to find more information to answer or solve the problem.

Then, the students had to record the number of resources they needed and how they discovered these resources in order to solve the problem. And these resources were listed and put all these resources needed in **"How can we find out we need to know?"** column which is the last columns in **"Need-to Know" Worksheet.**

Learning Stage 3: Self-study

During this time, the students were asked to gather necessary information individually towards the identified learning issues and a division of labor within the group was done. So, the students were allowed to choose a

particular area in which to concentrate their efforts. Learning issues were divided among students, so no two students had the same or every student could find out every issue. The students were asked to define central and peripheral issues and every student was asked to research central issues and divided up peripheral issues among group members.

On the part of the teachers, all the resources that will be needed for the students in solving the problem were prepared. Again, the students were asked to find the necessary resources from the library or internet search, by getting the help from teachers or by reading learning resources already given by the teachers or by looking for other additional resources in many possible ways. Then, they had to prepare answers to the formulated learning issues.

During this time, teacher gave **Learning Log** to all the groups to document what they wanted to learn and how they learned. This was also group activity. Every group had to use Learning Log and discussed to make an entry of all the information in the first and second columns respectively which are **"What we wanted to learn?"** column**,** and **"How we learned?"** column in **Learning Log**. In this way, all the groups had to think what information and concepts they had to gather and how all these resources and information would be found out to solve the problem.

Moreover**,** while solving the problem and collecting the necessary data, the teacher requested all the students to answer four monitoring questions on their own which are: **"Do I have a clear understanding of what I am doing? Does the task make sense to me? Am I reaching my goals? Do I need to make changes?"** in Metacognitive Prompts Worksheet to monitor their learning and regulate the information they got enough or not or need to make some changes while solving the problem or while they are on the track of the problem solving activity and while they are trying to arrive at the solutions. This was an individual activity. At that time, the teacher observed the students' behavior and their performances attentively.

Learning Stage 4: Group Analysis

All the necessary information gathering was gathered, the results of each individual's research had to be communicated to the group members and all the groups had to discuss what they learned after every group discussion.

At that time, the teacher asked the students the monitoring questions likes: **Are we reaching our goals? Do we need to make changes?"** again to themselves in Metacognitive Prompts Worksheet to decide whether the research results do contribute to the understanding of the problem, or do not. If they didn't, the original learning issues had to refined or rewritten. Then, the students were asked to return to the research phase to gather more information on the altered issues. This two-step phase of independent study and collaboration was continued until every member of the group was satisfied that the problem has been sufficiently explored. The number of iterations needed depends on the complexity of the problem and/or the learning issues. This process is a chance for students to apply knowledge and skills recently acquired back to the problem. This approach helps to build a "community of learners" and engages the students in collaboration with group members- a real world activity.

Learning Stage 5: Select the Most Feasible Solutions

Once knowledge was accumulated, all the students came together in their groups and then had to share their results and generated the most feasible solutions to the group members. Moreover, each group had to make entry of the new information or concepts in the last column of **"What we learned?" in "Learning Log"** to evaluate their gained knowledge.

Learning Stage 6: Present Findings

In this learning stage, each group needed to review the new information or concepts in the last column of **"Learning Log"** which is **"information that had been learned"** to present the findings of each group and share their results among the groups members of others and the results are made to known and the reasoning behind the solution is made apparent in order to support the selection of this particular solution. The teacher had to check that learning objectives had been met and the effectiveness of their learning and their metacognitive aspects would be found out.

Learning Stage 7: Evaluating Performance

At that time, the teacher insisted all the groups to answer evaluating questions on their own **"Have I reached my goals? What worked? What didn't work? Would I do things differently the next time?"** in Metacognitive Prompts Worksheet to evaluate all about the information they had collected, and their performances by themselves after solving the problem. This was an individual activity. At that time, the teachers observed all about their actions and record them accordingly.

By using the above PBL learning procedures, the researcher implemented Problem-Based Learning Process for nearly forty hours during intervention which encourages the development of metacognitive skills in Grade-6 students to grapple with authentic problems they are assigned to solve.

Data Analysis and Results

The results were presented in this section.

Development of Declarative Knowledge

Table 1: Results of Paired Sample t-test for Comparing Mean Difference between Pretest and Posttest Measures in Declarative Knowledge of Grade-6 Students

	Test	**Mean**	**Std.**	***t***	***df***	***p***
Declarative Knowledge	Pretest	2.88	1.024	- 6.155**	47	.000
	Posttest	3.69	1.055			

**p < 0.01; Mean Difference is significant at 0.01 level.

According to t-test result, the mean difference between pretest and posttest was significantly different (t= **6.155**, p < 0.01). Thus, it can be interpreted that there was a significant increase in **Declarative Knowledge** of Grade-6 students.

Development of Procedural Knowledge

Table 2: Result of Paired Sample t-test for Comparing Mean Difference between Pretest and Posttest Measures in Procedural Knowledge of Grade-6 Students

	Test	Mean	Std.	t	*df*	p
Procedural Knowledge	Pretest	2.60	1.067	- 3.493**	47	.000
	Posttest	3.21	1.110			

**p < 0 .01; Mean Difference is significant at 0.01 level.

According to t-test result, the mean difference between pretest and posttest was significantly different (t= **3.493**, p < 0.01). Thus, it can be said that there was a significant increase in **Procedural Knowledge** of Grade-6 students.

Development of Conditional Knowledge

Table 3: Result of Paired Sample t-test for Comparing Mean Difference between Pretest and Posttest Measures in Conditional Knowledge of Grade-6 Students

	Test	Mean	Std.	t	*df*	p
Conditional Knowledge	Pretest	2.81	1.179	- 3.865**	47	.000
	Posttest	3.46	1.051			

**p < 0 .01; Mean Difference is significant at 0.01 level.

According to t-test result, the mean difference between pretest and posttest was significantly different (t= **3.865**, p < 0.01). Thus, it can be interpreted that there was a significant increase in **Conditional Knowledge** of Grade-6 students.

Development of Metacognitive Knowledge

Table 4: Result of Paired Sample t-test for Comparing Mean Difference between Pretest and Posttest Measures in Metacognitive Knowledge of Grade-6 Students

	Test	**Mean**	**Std.**	**t**	***df***	**p**
Metacognitive Knowledge	Pretest	8.50	2.183	- 7.076**	47	.000
	Posttest	10.19	2.120			

**p < 0 .01; Mean Difference is significant at 0.01 level.

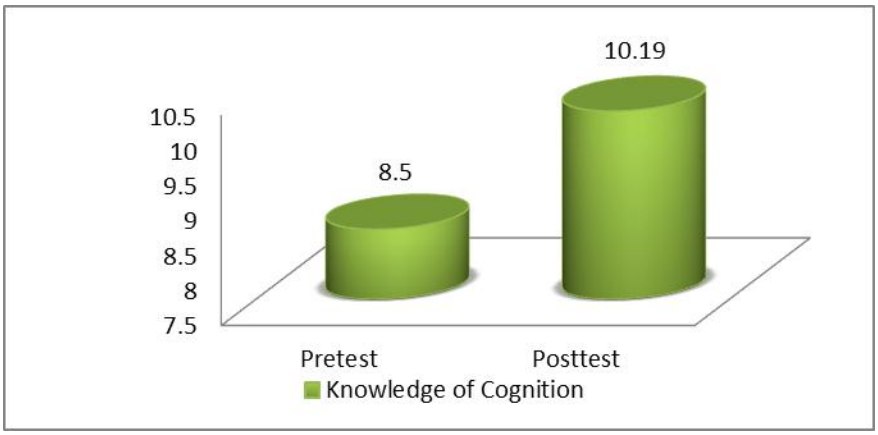

Figure 4: Mean Difference between Pretest and Posttest Measures in Metacognitive Knowledge

According to t-test result, the mean difference between pretest and posttest was significantly different (t= **7.076**, p < 0.01). Thus, it can be interpreted that there was a significant increase in **Metacognitive Knowledge** of Grade-6 students and hence there was significant development of **Metacognitive Knowledge** of Grade-6 students while solving problems through Problem Based Learning approach.

Development of Planning Skills

Table 5: Result of Paired Sample t-test for Comparing Mean Difference between Pretest and Posttest Measures in Planning Skills of Grade-6 Students

	Test	Mean	Std.	t	*df*	p
Planning Skills	Pretest	4.48	1.726	- 4.122**	47	.000
	Posttest	5.44	1.515			

**p< 0.01; Mean Difference is significant at 0.01 level.

According to t-test result, the mean difference between pretest and posttest was significantly different (t= **4.122**, p < 0.01). Thus, it can be interpreted that there was a significant increase in **Planning Skills** of Grade-6 students.

Development of Monitoring Skills

Table 6: Result of Paired Sample t-test for Comparing Mean Difference between Pretest and Posttest Measures in Monitoring Skills of Grade-6 Students

	Test	Mean	Std.	t	*df*	p
Monitoring Skills	Pretest	4.38	1.875	- 3.343**	47	.000
	Posttest	5.29	1.570			

**p< 0.01; Mean Difference is significant at 0.01 level.

According to t-test result, the mean difference between pretest and posttest was significantly different (t= **3.343**, p < 0.01). Thus, it can be interpreted that there was a significant increase in **Monitoring Skills** of Grade-6 students.

Development of Evaluation Skills

Table 7: Result of Paired Sample t-test for Comparing Mean Difference between Pretest and Posttest Measures in Evaluation Skills of Grade-6 Students

	Test	Mean	Std.	t	*df*	p
Evaluation Skills	Pretest	4.83	1.404	- 9.227**	47	.000
	Posttest	6.31	1.274			

**p < 0 .01; Mean Difference is significant at 0.01 level.

According to t-test result, the mean difference between pretest and posttest was significantly different (t= **9.227**, p < 0.01). Thus, it can be interpreted that there was a significant increase in **Evaluation Skills** of Grade-6 students.

Development of Metacognitive Regulation

Table 8: Result of Paired Sample t-test for Comparing Mean Difference between Pretest and Posttest Measures in Metacognitive Regulation of Grade-6 Students

	Test	Mean	Std.	t	*df*	p
Metacognitive Regulation	Pretest	13.71	4.589	- 6.530**	47	.000
	Posttest	16.58	3.891			

**p < 0 .01; Mean Difference is significant at 0.01 level.

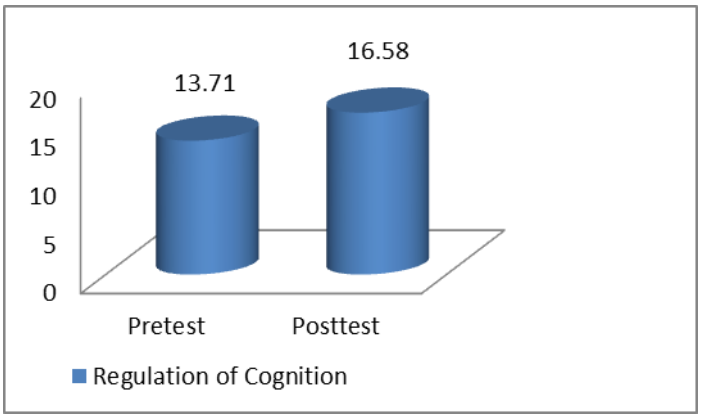

Figure 8 : Mean Difference between Pretest and Posttest Measures in Metacognitive Regulation

According to t-test result, the mean difference between pretest and posttest was significantly different (t= **6.530**, p < 0.01). Thus, it can be interpreted that there was a significant increase in **Metacognitive Regulation** and hence there was significant development of **Metacognitive Regulation** of Grade-6 students while solving problems through Problem Based Learning approach.

Development of Metacognitive Skills

Table 9: Result of Paired Sample t-test for Comparing Mean Difference between Pretest and Posttest Measures in Metacognitive Skills of Grade-6 Students

	Test	Mean	Std.	t	*df*	p
Metacognitive Skills	Pretest	22.00	6.395	-9.082**	47	.000
	Posttest	26.94	5.715			

**p < 0.01; Mean Difference is significant at 0.01 level.

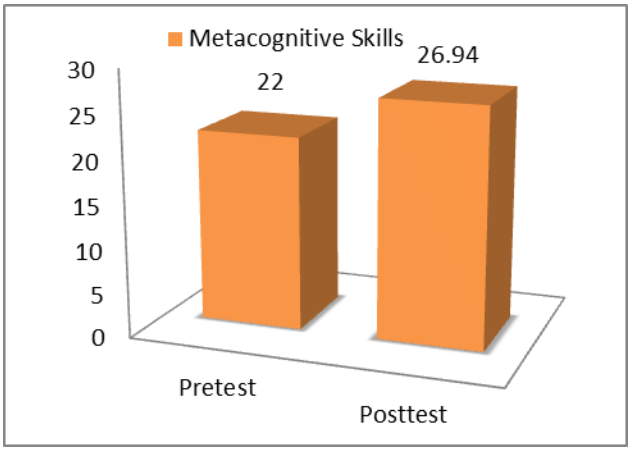

Figure 9: Mean Difference between Pretest and Posttest Measures in Metacognitive Skills

According to t-test result, the mean difference between pretest and posttest was significantly different (t= **-9.082**, p < 0.01). Thus, it can be interpreted that there was a significant increase in score on **Metacognitive**

Skills in pretest from posttest and hence there was significant development of **Metacognitive Skills** of Grade-6 students while solving problems through Problem Based Learning approach.

Conclusion

This is a study of investigating the impact of problem-based learning approach on Grade-6 students' metacognitive skills**.** The present study took place in Practising Middle School, Hlegu Education College, Yangon Region during 2017-2018 Academic Year. A total of 48 Grade-6 students were learned through PBL approach. According to quantitative results, the present study has proved that problem-based learning has positive impact on the development of Metacognitive Skills of Grade-6 students. From the above findings it could be concluded that learning stages of PBL approach definitely provides greater opportunity for the development of metacognitive skills. Therefore, the use of PBL approach facilitates the development of metacognitive and problem solving skills which has become an important goal among educators.

Moreover, this study highlights that metacognitive skills of planning, monitoring and evaluating are also important for the learner as they encourage self-reflection. Metacognitive skills are tools that empower the learner. Students very often fail to see learning as cycle that involves revisiting previous work to see where it can improve, acknowledging the value of mistakes, and planning improvements. By showing a learner that they can be in control of how they study, how they organize their work, and how they reflect upon it, we encourage them to take responsibility for learning. So, educators must implement problem-based learning in the classroom to accurately self-monitor and evaluate the problem solving abilities of children by sufficiently using metacognitive skills.

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A STUDY OF BIG FIVE PERSONALITY TRAITS OF B.Ed. FIRST YEAR STUDENTS AT THE UNIVERSITY FOR THE DEVELOPMENT OF THE NATIONAL RACES OF THE UNION

Nant Rosalin*

Abstract

The purpose of the study was to measure and compare the Big Five personality traits of B.Ed. first year students at the University for the Development of the National Races of the Union (UDNR).To fulfil the study, a simple random sampling technique was used in selecting 150 students of B.Ed. first year (65 males&85 females) who were chosen from three specialized subjects (Arts, Science and Combination of Arts & Science). The students' Big Five personality traits were examined by using the International Personality Item Pool (IPIP)(Goldberg, 1999) which comprised of the fifty statements about personality traits (10 statements about each personality trait) by collecting demographic information of the participants such as gender and specialized subject. The Big Five personality traits are Extraversion, Agreeableness, Conscientiousness, Neuroticism and Openness. Collected data was analyzed by using descriptive and inferential statistical techniques such as mean, independent sample t- test and ANOVA. It was found that B.Ed. first year students' Agreeableness personality trait was the greatest factor among participants in this study and Neuroticism personality trait was the smallest factor among them. Male students got greater scores on their Big Five personality traits instruments as compared to female students. There were significant differences between male and female students on Neuroticism and Openness personality traits; female students were stronger than male students on their Neuroticism personality traits and then male students were stronger than female students on their Openness personality traits. But there were no significant differences on remaining personality traits between male and female students. Another finding pointed out that there were no significant differences between specialized subjects on each Big Five personality trait.

Keywords: Personality, Extraversion, Agreeableness, Conscientiousness, Neuroticism, Openness.

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Introduction

As students proceed from childhood to adolescence, they experience increasing adjustments to perform well in a wide range of areas, both academic and non-academic. Having good adjustment and personality traits can fulfil part of a well-being of excellence and may be adaptive in achievement situations where striving of pedagogue could provide students with needful personality traits to do their best and thus achieve better grades.

Today, the conception of education is entirely new. According to this new conception every child grows spontaneously. Education must aim to make this spontaneous growth harmonious and progressive. Students should be given opportunities to think and to learn in their preferable ways of learning, so that their talent may contribute to the advancement of social welfare. Education must aim to make them creative in thought and original in matter of thinking and acting (Schunk, 2008, cited in Geta, M.,2012). In order to accomplish these aims of education, the spontaneous growth of students should not be interfered with other factors. This aspect is very important to prepare the leaders of the next generation in one country. Thus, the system to build the next generation should be focused the development of becoming a man with qualities, who has a winning and productive personality to pursue and achieve success entirely (cited in Geta, 2012).

There is a large variety in the study of personality (Mischel, 1999) but the tradition that has gained a lot of attention over the last few decades is the one focusing on the five factor model(Matthews, Deary,& Whiteman, 2013, cited in Jensen, 2015). This model is based on five distinguishable personality traits. These personality traits, often called the Big Five, are named Extraversion, Agreeableness, Conscientiousness, Neuroticism and Openness (cited in Jensen, 2015).

The present study emphasizes to investigate B.Ed. first year university students' big five personality traits. It is hoped that this study will be able to provide useful information for the teachers and students so that the teachers can understand and assist their students, and students can perform and behave with positive attitude around their environment.

Purpose of the Study

The main purpose of the study is to measure the Big Five personality traits of B.Ed. first year students at the University for the Development of the National Races of the Union (UDNR).

The three specific objectives are as follows:

(1) To investigate B.Ed. first year students' Big five personality traits Extroversion, Agreeableness, Consciousness, Neuroticism, Openness) at UDNR.

(2) To find out the differences on the Big five personality traits of B.Ed. first year students in UDNR by gender

(3) To compare the Big five personality traits of B.Ed. first year students in UDNR by specialized subjects.

Definition of Key Terms

Personality refers to the pattern of thoughts, feelings, social adjustment, and behaviors consistently exhibited over time that strongly influences one's expectation, self- perceptions, values, and attitudes (Winnie and Gittinger,1973; Krauskopf and Saunders,1994, cited in Khatibi & Khormaei, 2016).

The APA Dictionary of Psychology (2015) describes these as follows:

Extraversion is an orientation of one's interests and energies toward the outer world of people and things rather than the inner world of subjective experience.

Agreeableness is the tendency to act in a cooperative, unselfish manner.

Conscientiousness is the tendency to be organized, responsible, and hardworking.

Neuroticism (vs Emotional stability) is a chronic level of emotional instability and proneness to psychological distress.

Openness is the tendency to be open to new aesthetic, cultural, or intellectual experiences.

Review of Related Literature

Psychologists have studied personality over the past several decades and many theories have been developed regarding its definition and the traits that it encompasses. A major consensus was reached in the 1990s (Digman, 1990) with Five Factor Model (FFM) exemplified by Costa McCrae's work (1987). Norman (1963) and Tupes Christal (1962) have been regarded as original fathers of the FFM which states that individual differences in personality can be categorized into five major traits; Extraversion, Agreeableness, Conscientiousness, Neuroticism and Openness. These traits also known as the "Big Five", have become universally known and are used by researchers and practitioners alike. There is, in fact, substantive evidence for the use of the FFM as a framework to describe individual differences in personality which are generalizable across culture (Costa McCrae, 1992; McCrae John, 1992, cited in Using Visual Questionnaires to Measure Personality Traits).

Although different taxonomies and labels exit for each of the personality dimensions, the model is generally agreed upon and is used as the main classification of personality traits. These traits are defined as personal dispositions that are stable over time and that influence aperson's patterns of behaviors in different situations (Chamorro-Premuzic, 2007, cited in Using Visual Questionnaires to Measure Personality Traits).

Personality may be viewed as the dynamic organization of traits and characteristics of behavior that are unique to the individual (Callahan, 1966,cited in Arif, et al., 2012). Some social psychologists express that personality is entirely a matter of social awareness –which is pointless to talk about anyone's personality separated from the particular people who intermingle with him, get impersonation about him, and use trait terms in unfolding him (Holt, 1971,cited in Arif, et al., 2012).

According to Allport (1966, cited in Arif, et al., 2012), a trait

(1) is more wide spread than a habit,

(2) is forceful and determinative in behavior,

(3) may be viewed either in the light of the personality which contains it, or in the light of its division in the population at large, and

(4) cannot be proved non-existence by the absolute reality that some acts are incoherent with it.

Becoming aware of one's own personality type and the personality of other can be helpful in mounting intra-personal and inter-personal development. Personality recognition has been used for many purposes in various organizations; to focus a worker's aptitude to fill definite role, to set up pleasant-sounding relationship, to conclude team effectiveness, and to predict future behavior (Barbian,2001,cited in Arif, et al., 2012).

The personality theory of Jung (1971,cited in Arif, et al., 2012) assumes that people are dissimilar from each other in realistic types consisting of pairs of opposites. The first pair describes the way people gain their energy. Some people are thrilled by interacting with others and are tuned to the outer world of measures. Others are more thoughtful with the inner self and are thrilled by their own judgment and thought. The second pair in Jung's theory relates to the way individuals recognize and acquire information. Individual's principal in the sensing direction carefully examines information and employs all of their senses in their investigations. They are reality based and are thorough in investigating the data they have carefully collected. Individuals who are spontaneous rely on their instincts and trust their "sixth sense" to collect information. Two modes of decision and methods of reaching decisions are Thinking and Feeling. Thinkers are objective, logical and reasonable, and consider data in reaching conclusions. They are able to suspend their personal feelings when they logically resolve a dilemma. In contrast, Feelers are subjective and thoughtful of sentimental outcomes to precise situation. Feelers consider how their decisions will crash others. Myers and Briggs (1987, cited in Arif, et al., 2012) elaborated on Jung's theory by adding the Judgment/ Perception polarities. These functions indicate the mode in which people act together with the environment. Judgers prefer an organized and stable environment, and strive to regulate and manage their lives. Whereas, Perceivers are elastic and impulsive and favor to stay open to opportunities as they unfold.

Personality theory and measurement have begun quite early in the

history of psychology. However, it was only recently that researcher and practitioners generally embraced a unified or standardized theory and application in measurement and conceptualization of personality. According to Costa and McCrae (1992), people who score high on the Extraversion/ Assertiveness facet are forceful and are likely to become group leaders. Those who score high on the Extraversion/ Activity facet need to keep themselves occupied, are energetic, and live life at a fast pace. People who score high on the Agreeableness/Altruism facet care about the well-being of others and express this tendency by being generous and helping others. Individuals with high scores on the Agreeableness/Compliance facet are meek and try to avoid expressing anger and aggression. Those who score high on the Conscientiousness/Order facet are well organized and tidy. People who score high on the Conscientiousness/Self-Discipline facet are able to start and finish projects regardless of distractions and are self-motivated. Those who score high on the Neuroticism/Anxiety facet are apprehensive and inclined to worry. Individuals with high scores on the Neuroticism/Depression facet are likely to feel unhappy and despondent. People who score high on the Openness/Aesthetics facet have a heightened interest in art and beauty. Those who score high on the Openness/Ideas facet are intellectually curious and open to new ideas. (cited in Althoff, 2010)

Design and Procedure

Sampling. A simple random sampling technique was used in selecting 150 students (65 Males and 85 females) of B.Ed. first year students by specialized subjects. Fifty students from each of three specialized subjects were randomly selected in this study.

Research Method. The descriptive research design was used to carry out this study.

The Big Five Personality Traits Questionnaire. The study was utilized the instrument of the International Personality Item Pool (IPIP 50) (Goldberg, 1999) to measure B.Ed. first year students' Big five personality traits. The "Big Five'' factors of personality are five broad domains or dimensions of personality which are used to describe human personality.

These Big five personality traits are Extraversion, Agreeableness, Conscientiousness, Neuroticism and Openness. This inventory comprised of fifty statements about personality traits (10 statements about each personality trait). It consisted of a 5-point Likert scale. The responded categories to each of items were in descending order of weighting: "Strongly Agree" as "5", "Agree" as "4", "Neutral" as "3", "Disagree" as "2", and "Strongly Disagree" as "1".The internal consistency was 0.72 for the whole scale.

Data Collection. Students had to complete the Big Five personality questionnaire during approximately 25 minutes. Time duration responding to the questionnaires was from 8th January to 12th January 2018. After that, all the data fed into the computer and calculation was made through the utilization of the Statistical Package for Social Science (SPSS). The collected data was analyzed by using descriptive and inferential statistical techniques such as mean, independent sample t-test and ANOVA.

Data Analysis and Findings

An Analysis of B.Ed. First Year Students' Big Five Personality Traits by IPIP. Based on the descriptive statistics shown in Table (1) results revealed that mean score of B.Ed. first year students on Agreeableness personality trait was the greatest factor and mean score on Neuroticism personality trait was the smallest factor. Mean scores on Extraversion and Openness personality traits were nearly the same and mean score on Conscientiousness personality trait was moderate. So, it was found that the Agreeableness personality trait of B.Ed. first year students was stronger as compared to remaining four personality traits.

Table 1: Descriptive Statistics for Big Five Personality Traits of B.Ed. First Year Students

Personality Traits	Extraversion	Agreeableness	Conscientiousness	Neuroticism	Openness
Total Items	10	10	10	10	10
Range of Scores	1-50	1-50	1-50	1-50	1-50
Mean Score	33.34	39.89	35.65	30.85	33.83

Table 2 shows that there was no significant difference in Extraversion personality trait by gender (t= -.07, p=.94); there was no significant difference in Agreeableness personality trait by gender (t= -.53, p=.60); and there was no significant difference in Conscientiousness personality trait by gender (t= -.51, p=.61). So, it could be interpreted that the male and female students did not differ in Extraversion, Agreeableness and Conscientiousness personality traits. Another finding shows that there was significant difference in Neuroticism personality trait by gender (t=2.71, p<.01); and there was significant difference in Openness personality trait by gender (t=2.97, p<.01). Thus, it could be also that Neuroticism and Openness personality traits of male and female students differed significantly.

Table 2: Results of Independent Sample *t*-test for Big Five Personality Traits of B.Ed. First Year Students by Gender

Personality Traits	**Gender**	***St.dev***	***Mean Score***	***df=(n1+n2)-2***	***t*-value**	***p***
Extraversion	Male (n_1=65)	5.511	33.31	65+85-2=148	-.07	.94
	Female (n_2=85)	4.456	33.36			
Agreeableness	Male (n_1=65)	4.464	39.71	65+85-2=148	-.53	.60
	Female (n_2=85)	3.175	40.04			
Conscientiousness	Male (n_1=65)	5.81	35.40	65+85-2=148	-.51	.61
	Female (n_2=85)	4.74	35.84			
Neuroticism	Male (n_1=65)	6.11	32.55	65+85-2=148	2.71	.007*
	Female (n_2=85)	4.74	35.84			
Openness	Male (n_1=65)	5.06	35.31	65+85-2=148	2.97	.004*
	Female (n_2=85)	5.58	32.69			

*p<.01

In order to see vividly the mean difference, the mean scores of big five personality traits between male and female students were compared in Figure 1.

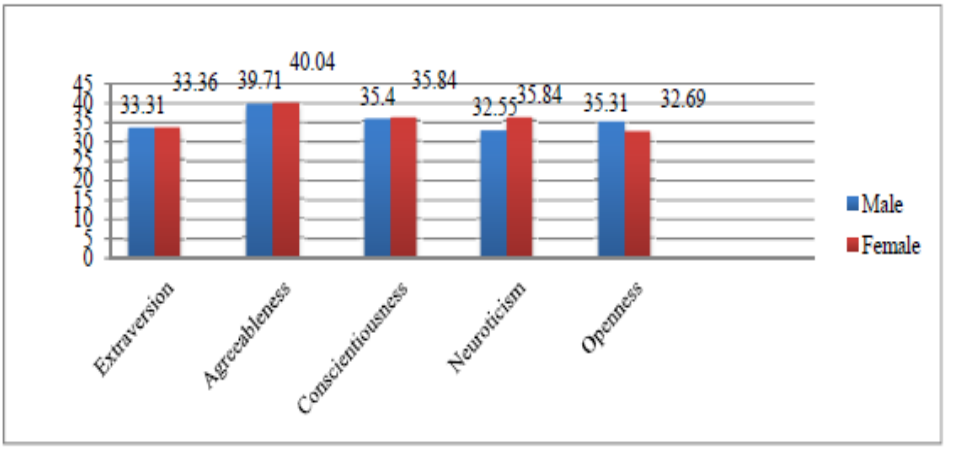

Figure 1: Mean Comparison for Big Five Personality Traits of B.Ed. First Year Students by Gender

According to Table 3, Arts, Science and Combination of Arts & Science students had the highest mean scores on Agreeableness personality trait. Arts, Science and Combination of Arts & Science students had the lowest mean scores on Neuroticism personality trait.

Table 3: Mean and Standard Deviation for Big Five Personality Traits by Specialized Subjects

Personality trait	Specialized Subjects	N	Mean	SD
Extraversion	Arts	50	32.78	4.82041
	Science	50	34.22	4.63919
	Combination of Arts & Science	50	33.02	5.26634
Agreeableness	Arts	50	39.34	3.85772
	Science	50	40.26	3.60731
	Combination of Arts & Science	50	40.08	3.87477
Conscientiousness	Arts	50	35.14	5.30695
	Science	50	36.54	5.04757
	Combination of Arts & Science	50	35.26	5.27145
Neuroticism	Arts	50	29.92	6.58644
	Science	50	32.12	6.73292
	Combination of Arts & Science	50	30.52	7.19195

Personality trait	Specialized Subjects	N	Mean	SD
Openness	Arts	50	34.02	5.25858
	Science	50	34.44	5.47728
	Combination of Arts & Science	50	33.02	5.75163

In order to see vividly the mean difference, the mean scores of big five personality traits among specialized subjects were compared in Figure 2.

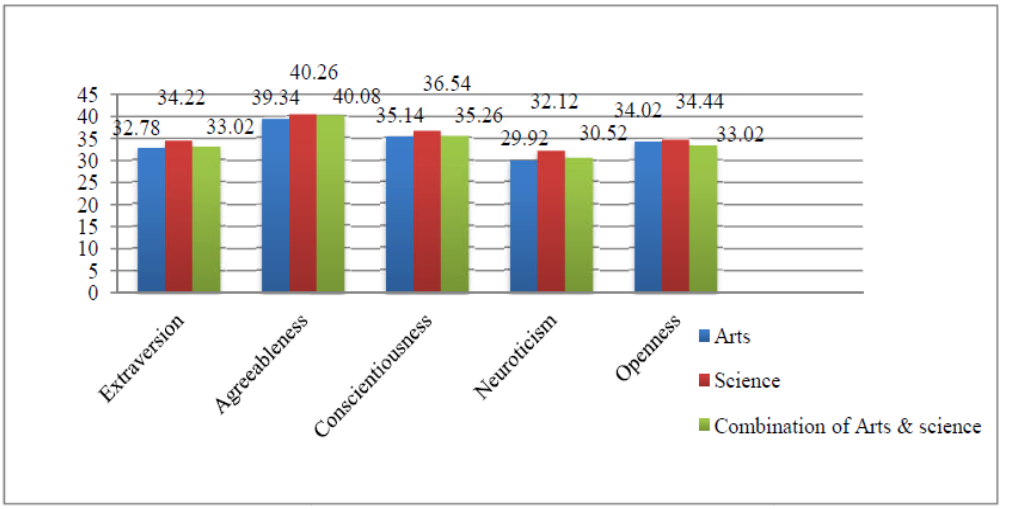

Figure 2: Mean Comparison for Big Five Personality Traits of B.Ed. First Year Students by Specialized Subjects

ANOVA results in table 4 was found that the obtained values $F(2,147) = 1.23$, $p = .295$ for Extraversion, $F(2,147) = .83$, $p = .438$ for Agreeableness, $F(2,147) = 1.11$, $p = .333$for Conscientiousness, $F(2,147) = 1.38$, $p = .254$ for Neuroticism and $F(2,147) = .89$, $p = .417$ for Openness did not differ at 0.05 level. Thus, there were no significant differences in big five personality traits of B.Ed. first year students according to specialized subjects.

Table 4: ANOVA Results for Big Five Personality Traits of B.Ed. First Year Students by Specialized Subjects

Personality trait		Sum of Square	*df*	Mean Square	*F*	*P*
Extraversion	Between Group	59.52	2	29.76	1.23	.295
	Within Group	3552.14	147	24.16		
	Total	3611.66	149			
Agreeableness	Between Group	23.77	2	11.89	.83	.438
	Within Group	2102.52	147	14.30		
	Total	2126.29	149			
Conscientiousness	Between Group	60.21	2	30.11	1.11	.333
	Within Group	3990.06	147	27.14		
	Total	4050.27	149			
Neuroticism	Between Group	129.33	2	64.67	1.38	.254
	Within Group	6881.44	147	46.81		
	Total	7010.77	149			
Openness	Between Group	53.21	2	26.61	.89	.417
	Within Group	4446.28	147	30.25		
	Total	4499.49	149			

Discussion and Conclusion

According to the table 1, results revealed that mean score of B.Ed. first year students on Agreeableness personality trait was the greatest factor and mean score on Neuroticism personality trait was the smallest factor. Mean scores on Extraversion and Openness personality traits were nearly the same, and mean score on Conscientiousness personality trait was moderate. So, it was found that the Agreeableness personality trait of B.Ed. first year students was stronger as compared to remaining four personality traits. It may be said that B.Ed. first year students are more likely to act in a cooperative, unselfish manner.

Another finding pointed out that having more mean score on Agreeableness personality trait of B.Ed. first year students in UDNR tends

to value their academic performance, interest in self-improvement and grade orientation.

Table 2 indicated that the male and female students did not differ in Extraversion, Agreeableness and Conscientiousness personality traits and then Neuroticism and Openness personality traits of male and female students differed significantly. Female students are greater than male students on Neuroticism personality trait and then male students are greater than female students on Openness personality trait. It may be said that female students are more likely to be a chronic level of emotional instability and proneness to psychological distress than male students and then male students are more likely to be open to new aesthetic, culture, or intellectual experiences than female students.

According to research finding, it can be concluded that having less mean score on Neuroticism personality trait of B.Ed. first year students tends to be more likely to display hopeful tendencies and are positively associated with well-being and more Conscientious personality trait of B.Ed. first year students are more likely to complete their educational programs, which is likely to be due to the same conscientiousness-related abilities and behaviors promoting academic performance.

In table 3, it was found that there were no significant differences in big five personality traits of B.Ed. first year students according to specialized subjects. It may be said that B.Ed. first year students possess equal big five personality traits according to specialized subjects.

To become well-being persons, all the students need to fulfil the personality traits on Agreeableness, Extraversion, Openness and Conscientiousness. In conclusion, it is expected that this research will contribute to the teachers and students who desire to become dutiful, responsible and accountable citizenship, and to enhance personality traits they need.

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CONSTRUCTION OF PARALLEL FORMS OF GRADE 10 CHEMISTRY AND FINDING ITS RELIABILITY COEFFICIENT OF EQUIVALENCE

Thae Phyu Htwe[1], Tun Thein[2]

Abstract

The main purpose of this study was to develop two parallel forms of test for Grade (10) Chemistry. This thesis was mainly concerned with planning, constructing, and analysis of test items. And then, two parallel forms of test were administered to 524 Grade (10) students from Ten Basic Education High Schools in Yangon Region. Descriptive survey method and quantitative research design were used in this study. From 80 items of both forms, 12 pairs of items were selected as parallel items according to their similar levels and ranges of difficulties and discriminations. Since reliability coefficient of equivalence of Form A and Form B is 0.703, both forms have strong positive relationship. So, students who performed well in Form A would also perform well in Form B. Form A can be used to get more information for measuring chemistry achievement of students who have $\theta = -1.4$. Form B had smaller standard error across the ability scale from -2.5 to +1.5 and larger standard error had at the low and high ends of the scale. The maximum amount of information was $I(\theta) = 6.7$ at $\theta = +0.2$. Ability estimates were more precise across the ability scale from -2.5 to +1.5 than at the high and low ends of the scale. Therefore, Form B could be suitable to measure for students whose ability is $\theta = +0.2$. The expected ability distributions of the students (Form A and Form B were applied) were normally distributed across the ability scale.

Keyword: Parallel Forms of Tests, Reliability, Reliability Coefficient, Coefficient of Equivalence

Introduction

There is considerable controversy about the extent of testing and about the fact that some very important decisions are based on test results. But educational tests and other measurement devices are a useful and essential part of teaching and learning. In order to get the necessary information about each student, the teachers need to select or create appropriate tests. A teacher

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uses a wide variety of test formats in order to tap students' different skills, memory, creativity, ability to organize information and the like.

Assembling equivalent test forms with minimal test overlap across forms is important in ensuring test security. Parallel-forms reliability compares two different experiments that used the same content. An increase in the number of items (tasks) to be assessed might make activities more homogenous (Dunbar, Koretz, & Hoover, 1991). Parallel forms of test can be used to find the reliability and to assess the effectiveness of instruction and training programs. Parallel forms of tests are useful to prevent knowing prematurely the test paper. Parallel forms of tests are much easier to develop for well-defined characteristics. For example, achievement tests that are given to students at the beginning and end of the school year are alternate forms. Parallel forms of tests are essential for constructing pretest and post-test to measure the effectiveness of instruction in schools and training programs. So, it is important that the teacher should acquaint with the nature, construction and uses of parallel forms of test.

Science is everywhere in today's world. It is part of our daily lives, from cooking and gardening, to recycling and comprehending the daily weather report, to reading a map and using a computer. So, children need to understand that or to be taught to think critically or provided with the tools to analyze and test a problem or situation. Chemistry is at the heart of environmental issues. Chemistry is important because everything you do is chemistry! (Helmenstine, A.M., 2014). Chemistry is sometimes called "the central science" because it bridges other natural sciences like Physics, Geology, and Biology with each other. Students wanting to become doctors, nurses, physicists, nutritionists, geologists, pharmacists, and (of course) chemists all study chemistry because chemistry related jobs are plentiful and high-paying.

All schools, including government schools, comprehensive schools, and private boarding schools have taken the University Entrance Examination, commonly referred to as the matriculation exam administered by the Myanmar Board of Examinations. Students are administered a combination of 6 tests depending on their tracks: arts, science, and arts and sciences. The subjects offered are Myanmar, English, Mathematics, Chemistry, Physics,

Biology, History, Geology, Economy and Optional Myanmar. Matriculation examination is important for students for joining universities and choosing career for their whole-lives. In order to achieve success in the matriculation examination, Grade (10) is important as a basic for matriculation examination. Therefore, this research studied how to develop Grade 10 Chemistry test and proposed about finding reliability of equivalence of the two parallel forms of tests.

Purposes of the Study

The main purpose of the study is to develop parallel forms of Grade 10 Chemistry. The specific objectives of the research are to construct two parallel forms of Grade (10) Chemistry by applying IRT technique and to find the reliability coefficient (of equivalence) of the test.

Definitions of the Key Terms

Parallel Forms of Tests: Two tests that follow the same test plan but have different content in which the items are the same in type, cover the same content, have the same distribution of difficulty values, and yield scores having the same mean, variability, and reliability. (Ebel,Robert L, 1962)

Reliability: The reliability of a test refers to the consistency with which it yields the same rank for individuals who take the test more than once. (Kubiszyn.T & Borich.G, 2007)

Reliability Coefficient: The reliability coefficient can be defined as the correlation between scores on parallel test forms. (Crocker.L & Algina.J, 1986)

Coefficient of Equivalence: The coefficient of equivalence is the correlation coefficient between the two parallel forms of test. (Crocker.L & Aligna.J, 1986)

Review of Related Literature

The Nature of Parallel Forms of Test

Suppose that all candidates for entry into a particular health occupation must take a state board examination, which is administered under controlled conditions at a particular site on a given date. To reduce the possibility of

cheating, examinees in adjacent seats take different forms of the test covering the same content. Clearly each examinee has the right to expect that his or her score would not be greatly affected by the particular form of the test taken. In this case, the errors of measurements that primarily concern test users are those due to differences in content of the test forms. Of course, administration and scoring errors, guessing, and temporary fluctuations in examinee's performance may also contribute to inconsistency of scores.

The alternate form method requires constructing both forms to the same group of examinees. The forms should be administered within a very short time period, allowing only enough time between testings. So that examinees will not be fatigued. It is considered desirable to balance the order of administration of the forms so that half the examinee are randomly assigned to form 1 followed by form 2, where as the other half take form 2 followed by form 1.

Any test that has multiple forms should have some evidence of their equivalence. Typically, tests of achievement and aptitude are constructed with multiple forms since some clinical, educational, or research uses require the examinee to have an opportunity to retake the examination, and the test user does not want to use the same items for the second test. Although there are no hard, fast rules for what constitutes a minimally acceptable value for alternate form reliability estimates. (Crocker & Algin, 1986)

The Most Important Qualities of Parallel Forms of Test

Alternate forms of a test should be thought as forms built according to the same specifications but composed of separate samples from the defined behavior domain. Thus, two parallel tests should contain questions of the same difficulty. The same sorts of questions should be asked; for example: there should be a balance of specific fact and general idea questions. The same types of passages should be represented, such as expository, argumentative, and aesthetic but the specific passage topics and questions should be different.

It is important that characteristics of a good test will be considered by test constructors. In judging the quality of a test some of the important factors-relevance, balance, efficiency, objectivity, fairness and speediness need to be

considered. Among them, validity and reliability are two main characteristics. These two are generally accepted universals.

Validity

Validity may be defined as the degree to which a test measures what it is intended to measure. The validity coefficient enables us to determine how closely the criterion performance could have been predicted from the test scores.

The American Psychological Association's Standard for Educational and Psychological Testing (1985) and Psychological testing specialists generally recognize three ways of deciding whether a test is sufficiently valid to be useful. There are content validity, criterion-related validity, and construct validity.

"Content validity involves essentially the systematic examination of the test intent to determine whether it covers a representative sample of the behavior domain to be measured."

"A test that has high content validity can be built by (i) identifying the subject matter topics and behavioral outcomes to be measured; (ii) building a table of specifications; which specifics the sample of items to be used, and (iii) Constructing a test that closely fits the table of specifications. These are the best procedures we have for measuring high content validity." As a result, it is evident that one way to ensure high content validity is to prepare a detailed specifications table or blueprint for the examination. Alternate form of a test must parallel each other in both content and difficulty. If the forms measure different content, they cannot be used interchangeably. If one form is easier than another, a passing score has different meaning for the respective forms and students will be classified as a function of test difficulty rather than degree of competence. So it is importance to develop alternate forms that parallel in content validity.

Reliability

Reliability of a test refers to the extent to which it consistently measure what is supposed to measured.

Sometimes, two or more equivalent forms of a given test will be developed to increase flexibility in administering the test. The availability of parallel forms allows retesting without worrying about practice effects. Or a teacher may wish to develop two forms of a test to reduce the likelihood of individuals copying answer from students seated nearly.

Whenever two or more forms of a test are developed with the intent of using these forms interchangeably, it is desirable to compute parallel-form reliability. This verifies the alternate test forms are measuring the something. To estimate parallel-form reliability, both forms of the test are administered to the sample people. The correlation between scores on the two forms indicates the degree to which they have parallel form reliability.

Although establishing parallel-form reliability for classroom tests is preferred when multiple forms are used, a teacher seldom has the opportunity to administer every form to each student. Therefore, alternative solutions are needed.

If the purpose of using the multiple forms is simply to control copying, a preferred orders on the two forms by using the same items but in different orders on the two forms. Probably the simplest procedure for altering the order of items is to begin a second test form with items located near the middle of the first form. Research has shown that the order in which items are presented on a test has minimal or no effect on the scores of examinees. Consequently, there is little reason to estimate parallel form reliability when the only difference between the alternate forms is the order in which the test items are presented.

When equivalent forms are developed so that students can, at a later time, be administered a retest, then distance (although similar) items should be used on the different forms of the test. In this situation, the optimal procedure is to compute the parallel-form reliability by calculating the correlation between scores on the two forms. But again, this is usually impractical.

A reasonable alternative is to take steps to ensure the equivalence of the forms. This might include writing items from carefully assigning items that measure each skill to the respective forms of the test.

Developers of commercially prepared tests sometimes prepare two equivalent forms of a given instrument. As part of their test-development process, the developers will compute the parallel-form reliability by simultaneously administering both forms of the test to a group of students. The correlation coefficient between these examinees' scores is then computed. If the alternate forms are measuring the same skills, this reliability coefficient approaches 1.00. (Oosterhof, 1990), (Thorndike, 1991)

Procedures for Developing Parallel Forms of Test

Two or more forms of an educational test are considered to be equal or equated when practically identical scores on each are made by the same individuals or by the same ability. This means that the forms of the test must be made up of test items which parallel one another closely in difficulty. In practice, such close equality of an item difficulty in alternate forms is obtained in one of three ways.

The First Procedure

This procedure involves the preparation of large number of items covering the total range of the subject matter to be tested, on the chance that there will be a sufficient number of items at each of many difficulty levels to permit of pairing items of equivalent difficulty in the alternate forms of the test. When this is done, the alternate forms of the test may be considered roughly equal in difficulty but there will be only a very general and broad equivalence of content.

The Second Procedure

This involves the preparation of parallel items on certain selected, important concepts. One item may test the identification of concept, while the other may test the identification of an additional phase of the concept or some phase of the identification of the procedure involved.

The Third Procedure

It permits the establishment of comparable forms of tests by the use of derived scores although the complexity of the statistical techniques necessary and the variety of derived scores which are used in this way make a complete presentation impracticable at this point. It may suffice here to say that the

derived scores are so established that they have constant meanings, whether or not they are obtained on the same form or from the same pupil group, and that the method establishing a 'normalized group' is basis to the procedure.

In these procedures, the items are arranged in such a manner that the two forms represent almost exactly the same difficulty as a whole, as well as almost parallel difficulty at any given point in the test. An exact equivalence of difficulty is not demanded of each pair of items as a slight difference in difficulty for the two items of one pair may be compensated by an opposite and equivalent difference in difficulty for the item of another pair. This method of shifting and balancing the items for the two forms of the test results in a roughly scaled test of two or more forms composed of items likely to be failed by approximately the same percentages of cases. The accuracy of this method of equating test forms depends to a large degree up on the extent and the representative nature of the sampling of pupil responses used in the preliminary evaluation of the items.

General Suggestions Concerning Parallel Forms of Test Construction

The general suggestions concerning parallel forms of test construction are the following.

- Prepare a preliminary draft of the test based on the table of specifications.
- Include more items in the first draft of the test than will be needed in the final form.
- After some time has elapsed, the test should be critically reviewed in order to check the items with the original outline.
- The items should be phrased so that the content rather than the form of the statement will determine the answer.
- The difficulty level of the items should be appropriate to the group of examines.
- The item content should be determined by the importance of the subject matter.
- Classroom tests should be power tests, not speed test keep tests short enough so that all students can finish.

- Keep the reading level low.
- The test may include more than one type of item.
- All the items of a particular kind should ordinary be placed together in the test.
- To the extent that it is feasible, items of a particular type should be arranged in ascending order of difficulty.
- The directions to the pupil should be as clear, complete, and concise or possible.
- Before the actual scoring begins, prepare answer keys and scoring procedures.

Methodology

Sample of the Study

This study used two parallel forms (Form A and Form B) of Chemistry achievement test for Grade (10). This study is geographically restricted to Yangon Region. Ten Basic Education High Schools were selected for this study. Participants in this study are Grade (10) students from the selected schools within the academic year (2013-2014). In each selected school, 50 students participated in this study. The content area was limited to seven chapters from Grade (10) Chemistry textbook to investigate the item qualities based on students' responses.

Instrumentation

In this study, two parallel forms of test for Grade (10) Chemistry were constructed under the direction and guidance of experts in educational test and measurement field, experts in educational methodology department and experienced teachers in chemistry department with the reference of Grade 10 Chemistry textbook and some GCE O level questions. The type of test items that is used in two forms is multiple-choice items with four alternatives.

First, seven chapters from given content of Grade 10 Chemistry Text Book were selected and multiple-choice (MC) items were constructed systematically according to rules of construction. Second, about 120 items were selected from total number of 164 items. After preparing the table of

specifications, expert review was conducted for face validity and content validity by 6 experts in the educational psychology department, department of educational methodology, and chemistry department in Yangon Institute of Education (YIOE). Next, revisions in wording and length of items were made according to supervision and editorial review of these experts. And then, each form of test was administered to 135 students from B.E.H.S (1) Hlaing in Yangon City for pilot testing. And then, some incorrect or ambiguous items and unfair items were corrected or reworded and removed based on the results of scattered diagrams.

All the items in each form were multiple-choice items. Each form consists of 40 multiple-choice items. The two forms of test were constructed in such a format that it covered the four areas based on Grade (10) Chemistry Text Book concerning knowledge, comprehension and application levels of educational outcomes.

Achievement test should measure an adequate sample of the learning outcomes and subject matter content included in the instruction. However, it is difficult to cover all the instructional objectives and all the content of course in the limited time available for testing. Therefore, a sample of items selected from the topics of instruction must be representative. One way to get greater assurance is planning a table of specifications. Both forms of test were prepared based on the same table of specifications.

Selection of Townships and Schools

At first, the townships in Yangon Region were stratified on the basis of geographical region as East, West, South and North. Schools in respective townships were selected based on the (2012-2013) matriculation pass percentage. Selected Ten Basic Education High Schools are listed in Table 3.1.

Table 3.1: Selected Schools and Number of Students from Yangon City for Administering Form A and Form B

District	Name of Schools	Pass % (Matric)	Number of Students			Total Students
			Male	Female	Total	
East	B.E.H.S (1) Thingungyun	51.13%	24	26	50	152
	B.E.H.S (2) Tamwe	46.60%	17	35	52	
	B.E.H.S (5) North Okkalapa	38.60%	17	33	50	
West	B.E.H.S (2) Kamaryut	89.17%	26	24	50	150
	B.E.H.S (3) Bahan	25.58%	25	25	50	
	B.E.H.S (4) Hlaing	41.44%	23	27	50	
South	B.E.H.S (2) Thanlynn	39.64%	29	27	56	106
	B.E.H.S (3) Thanlynn	28.57%	22	28	50	
North	B.E.H.S (1) Hlaing Thar Yar	18.68%	22	44	66	116
	B.E.H.S (3) Insein	28.83%	19	31	50	
Total	10		224	300	524	524

Test Administration

After the tests required have been formed, the next step is to prepare for the administration. Each form of test is divided into three subtests as knowledge, comprehension and application. Each form contains 40 items. Both forms of the test were administered to 524 Grade (10) students. The data so obtained was analyzed for obtaining the pairs of items based on their levels and respective areas.

Table 3.2:Showing the Difficulty and Discrimination Indices for the Knowledge Level Items in the Content Area 'Formula, Equation & Naming'

No	Subtest	Item No	P_H	P_L	Difficulty	Discrimination
1	1	2.1	0.44	0.25	0.345	0.19
2	1	2.2	0.67	0.25	0.46	0.42
3	1	2.3	1	0.5	0.75	0.5
4	1	2.4	0.84	0.5	0.67	0.34
5	1	2.5	0.72	0.42	0.57	0.3
6	1	2.6	0.31	0.06	0.185	0.25
7	1	2.7	0.89	0.36	0.625	0.53
8	1	2.8	0.64	0.56	0.6	0.08
9	1	2.9	0.44	0.39	0.415	0.05
10	1	2.10	0.83	0.31	0.57	0.52
11	1	2.11	0.47	0.25	0.36	0.22
12	1	2.12	0.78	0.14	0.46	0.64
13	1	2.13	0.78	0.36	0.57	0.42
14	1	2.14	0.11	0.11	0.11	0
15	1	2.15	0.69	0.17	0.43	0.52
16	1	2.16	0.64	0.25	0.445	0.39

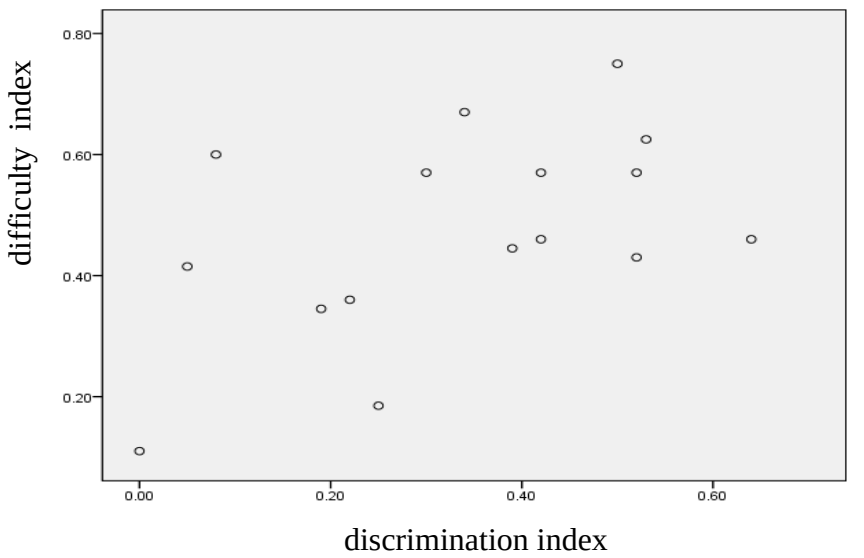


Figure 3.1: Selection of Knowledge Level Items in the Content Area 'Formula, Equation & Naming' with respect to Similarities in their Difficulty and Discrimination

Before the actual equating procedure, the descriptive statistics for Form A and Form B 2 were calculated using SPSS 16.0 programs. The distributions of scores on each form are shown in Figures 3.2 and 3.3. Descriptive statistics of both forms are described in Table 3.3.

Form A

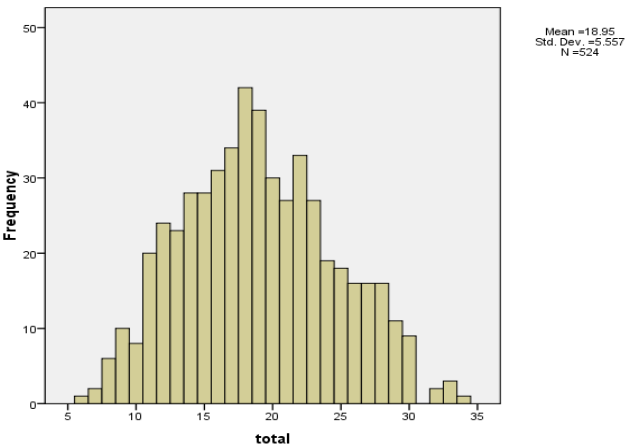


Figure 3.2 : Score Distribution of Chemistry Test Form A

Form B

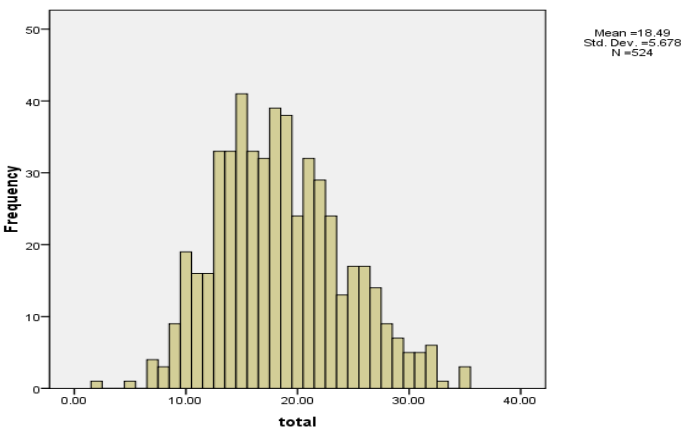


Figure 3.3: Score Distribution of Chemistry Test Form B

Table 3.3 : Comparison of Form A and Form B (Total)

	Form A	Form B
N Valid	524	524
Missing	0	0
Mean	18.95	18.491
Std. Deviation	5.557	5.678

According to Table 3.3, the means and standard deviations of Form A and Form B were little different. This fact showed that the ability level of the students were not too different attempting in both forms.

Data Analysis and Findings

Data Analysis for Checking Assumptions of Equating Test Scores

To be able to meet the assumptions of equating test scores, two forms of chemistry achievement test (Form A and Form B) were developed. The descriptive statistics of two forms of chemistry test are described in Table (4.1).

Table 4.1: Descriptive Statistics of Form A and Form B

Test Form	Number of Examinees	Scale	Mean	Std. Deviation
Form A	524	Raw	18.95	5.557
Form B	524	Raw	18.491	5.67827

Before equating Form A and Form B, the raw score means of these two forms were 18.95 and 18.491. It may be interpreted that Form A was slightly different in level and range of difficulty to Form B in measuring student's chemistry achievement even though it was tried to meet the assumptions of equivalent content and statistical specifications before actual equating procedure. As a consequence, any comparison of two test forms would be unfair for the group. Therefore, equating, the statistical method, is necessary to adjust the differences between test scores obtained from two forms due to forms difficulty. By doing so, these forms can be used interchangeably in any time of examination and the test scores of examinees took different forms can be compared.

Investigation of Phase 2 Output for Test Equating

Since two forms of chemistry test were analyzed by 2PL model in this study, so there was no c or guessing parameter for these items. The results of the item parameter estimation of both forms are described in Table 4.2.

Table 4.2 Item Parameter Estimates for Form A and Form B

Test A			Test B		
Item	***a***	***b***	**Item**	***a***	***b***
1	0.379	-0.623	1	1.78	0.347
2	0.367	3.355	2	0.501	-1.065
3	0.678	-1.014	3	0.857	-1.553
4	0.734	-0.788	4	0.46	0.926
5	0.485	-1.069	5	0.226	-0.946
6	0.463	-1.434	6	0.415	-0.703
7	0.513	-0.784	7	0.279	-0.361
8	0.584	-0.171	8	0.375	0.27
9	0.372	1.377	9	0.416	-0.002
10	0.494	-0.725	10	0.276	0.597
11	0.442	-0.264	11	0.774	-0.203
12	0.845	-1.713	12	0.889	-2.188
13	0.448	0.909	13	0.334	1.731
14	0.697	0.091	14	0.271	1.949
15	0.715	-1.233	15	0.824	-1.616
16	0.215	3.044	16	0.209	2.736
17	0.479	-0.561	17	0.452	0.17
18	0.363	-0.421	18	0.242	2.629
19	0.439	0.951	19	0.222	3.014
20	0.237	3.955	20	0.345	0.53
21	0.439	0.364	21	*	*
22	0.557	-0.217	22	0.365	0.784
23	0.182	3.523	23	*	*
24	0.486	-0.747	24	0.195	2.237
25	0.154	1.511	25	0.176	3.673
26	0.316	2.716	26	0.42	1.122

Test A			**Test B**		
Item	***a***	***b***	**Item**	***a***	***b***
27	0.137	0.854	27	0.151	1.391
28	0.203	5.133	28	0.22	3.7
29	0.381	1.693	29	0.473	-0.066
30	0.785	-1.748	30	0.64	-1.101
31	0.274	2.921	31	0.413	0.689
32	0.227	1.616	32	0.231	1.229
33	0.614	-0.3	33	0.99	-0.185
34	0.161	1.883	34	1.15	-0.349
35	0.431	-0.797	35	0.182	3.375
36	0.153	4.63	36	0.392	0.01
37	0.328	0.622	37	0.296	1.78
38	0.667	-0.675	38	0.574	-1.179
39	0.22	2.577	39	0.22	1.746
40	0.397	-0.438	40	*	*

Note. *a*: item discrimination parameter, *b*: item difficulty parameter.

good = 12
acceptable = 17
reject = 11

Table 4.3: Reliability Coefficient of Equivalence of Parallel Forms (Form A and Form B)

		Form A	Form B
Form A	Pearson Correlation	1	.703**
	Sig. (2-tailed)		.000
	N	524	524
Form B	Pearson Correlation	.703**	1
	Sig. (2-tailed)	.000	
	N	524	524

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

Table 4.4: Item Parameters for the Whole Test

Test	Parameters			
	Discrimination (*a*)		Difficulty (*b*)	
	Mean	Std.Deviation	Mean	Std.Deviation
Form A	0.427	0.190	0.700	1.839
Form B	0.473	0.336	0.649	1.555

The total information curve (TIC) gives the average probability or expected proportion of the correct as a function of the underlying latent trait. TIC is used as a replacement for the traditional concept of reliability and standard error of measurement. The standard error of the test is the inverse of the square root of information, thus, the greater information causes the smaller the standard error and the greater the reliability. Based on the results of parameter estimates of the two forms, the total information curves (TIC) for Form A and Form B were plotted.

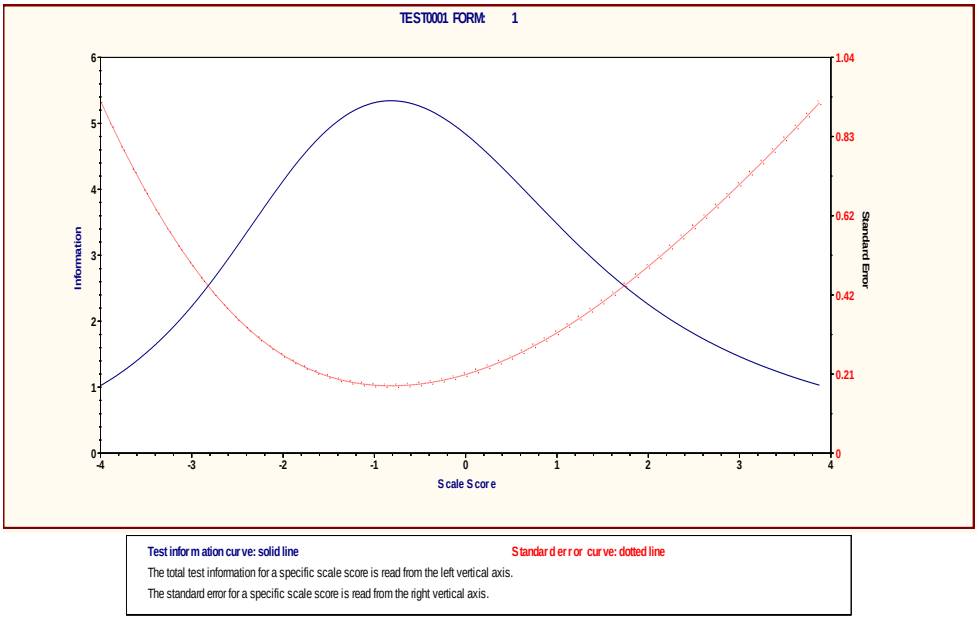


Figure 4.1: Total Information Curve of Form A

Figure 4.1 illustrated that Form A had smaller standard error across the ability scale from -2.8 to +2.7 and larger standard error at the low and high ends of the scale. The maximum amount of information was I(θ) = 6.4 at θ = -1.4. The estimation of the students' ability was more precise across from -2.8 to +2.7 than at the low and high ends of the scale. Therefore, it may be concluded that Form A can be used to get more information for measuring chemistry achievement of students who have θ = -1.4.

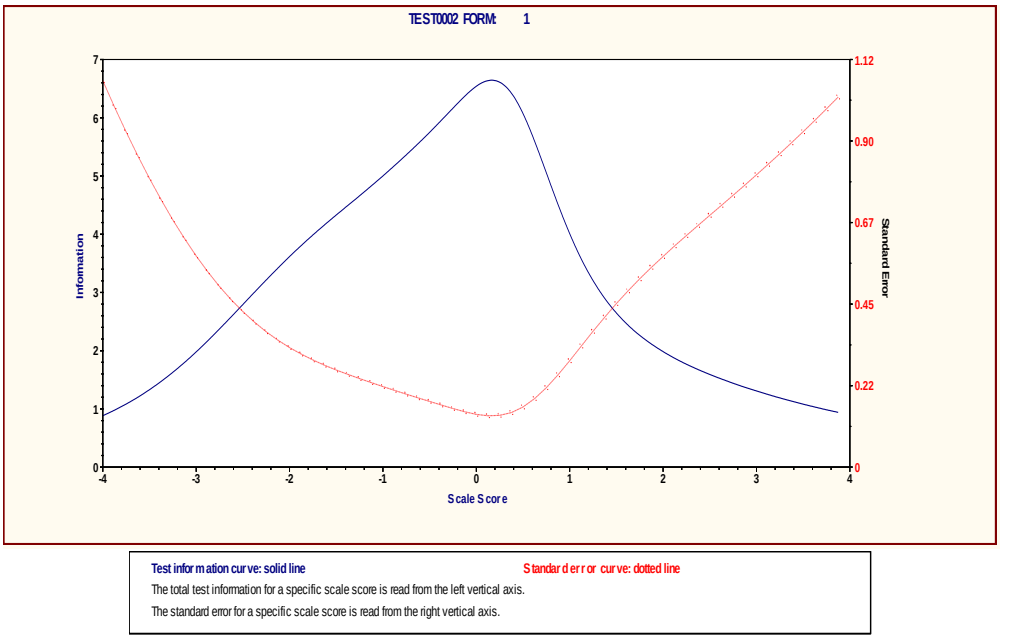


Figure 4.2: Total Information Curve of Form B

In the same way, Figure 4.2 showed that Form B had smaller standard error across the ability scale from -2.5 to +1.5 and larger standard error had at the low and high ends of the scale. The maximum amount of information was I(θ) = 6.7 at θ = +0.2. Ability estimates were more precise across the ability scale from -2.5 to +1.5 than at the high and low ends of the scale. Therefore, it may be interpreted that Form B can be suitable to measure for students whose ability is θ = +0.2.

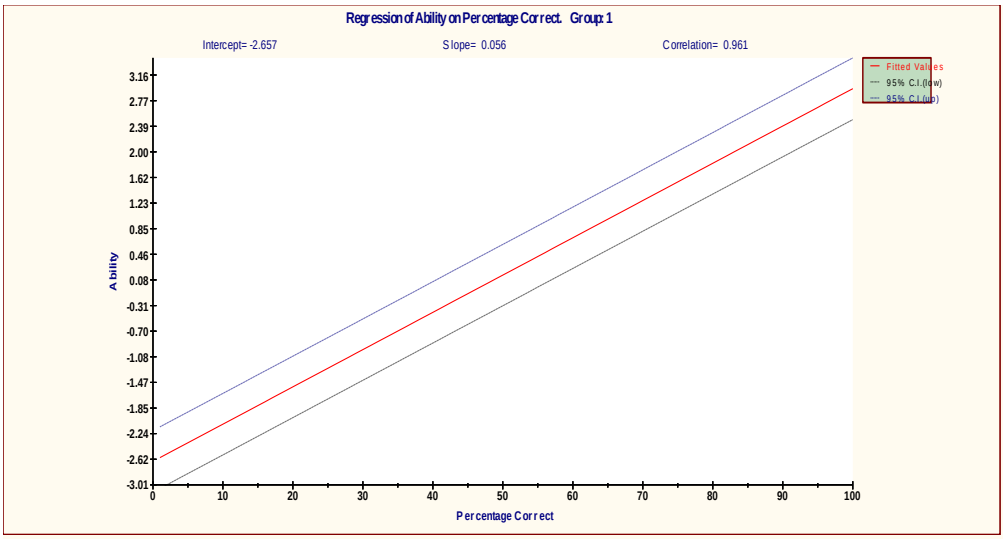
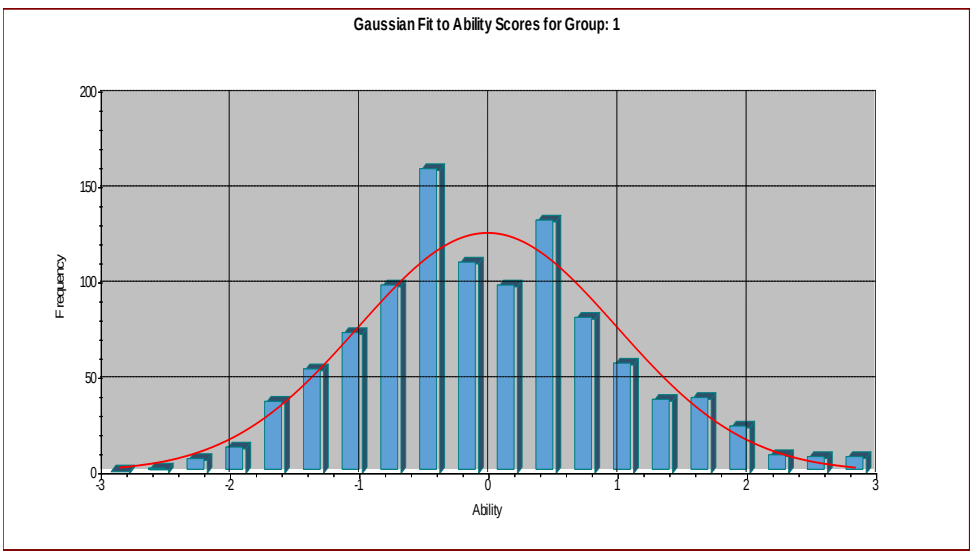


Figure 4.3: Regression of Ability on Percentage Correct for the Group



Histogram of abilities

Ability scores are transformed to have a mean of zero and a standard deviation of 1.

The area under the bell-shaped curve equals the total area of the histogram.

Figure 4.4 : Ability Distribution of the Students

Conclusion, Suggestion and Recommendations

Conclusion

In this study, both classical item analysis and IRT technique were used. After the test administration and scoring from pilot study, good and poor items are obtained by using item analysis technique. Then the good items which are similar not only in form and content but also in difficulty and discrimination indices were selected from four content areas to be used in the parallel forms of test. Hence, two parallel forms have been developed which have similar format, content, item difficulty and item discrimination. The total number of items constructed for the four content areas-Basic Concepts of Chemistry, Formula, equation & Naming, Solution and Gas are 120 items. From this, 80 items were selected to be used in the two parallel forms of test with the help of their respective scatter diagrams.

In this study, two forms of chemistry achievement test consisting of 40 multiple-choice (MC) items for Grade (10) students were constructed under the supervision of 6 experts in the field of education to measure the same construct. Although test forms were constructed as similar as possible to one another in content and statistical specifications, these forms might be slightly different to some extent in level and range of difficulty. Form A and Form B were administered to 524 students from selected high schools in Yangon Region. Since the sample of students were administered both forms, the researcher chose Single Group Design (Design A) of linear equating method to equate these forms. Since two forms of chemistry test were analyzed by 2PL model in this study, so there was no (c) or guessing parameter for these items. The prepared data set were entered in BILOG-MG 3 program to calibrate both forms in single run. Parallel items of both forms are selected according to their difficulty (b) and discrimination (a) values. According to Hambleton et al. (1991), the usual range for a is from 0 to 2 and high value of *a* indicates that the higher discrimination power of an item between high and low achievement of students. The values of *b* typically vary from about -3 to +3 (Hambleton,1989, Fischer & Molenaar, 1995) and the negative sign indicates that easier item difficulty and positive sign indicates that harder item difficulty. So, it can be said that these items can discriminate students who know answers from students who do not know answers. From

80 items of both forms, 12 pairs of items are selected as parallel items according to their similar levels and ranges of difficulties and discriminations. These items are item no 3, 6, 11, 12, 13, 15, 27, 30, 32, 33, 37, and 38.

Since reliability coefficient of equivalence of both forms (Form A and Form B) is 0.703, both forms have strong positive relationship. So, students who performed well in Form A would also perform well in Form B. Form A had smaller standard error across the ability scale from -2.8 to +2.7 and larger standard error at the low and high ends of the scale. The maximum amount of information was $I(\theta) = 6.4$ at $\theta = -1.4$. The estimation of the students' ability was more precise across from -2.8 to +2.7 than at the low and high ends of the scale. Therefore, it may be concluded that Form A can be used to get more information for measuring chemistry achievement of students who have $\theta = -1.4$. Form B had smaller standard error across the ability scale from -2.5 to +1.5 and larger standard error had at the low and high ends of the scale. The maximum amount of information was $I(\theta) = 6.7$ at $\theta = +0.2$. Ability estimates were more precise across the ability scale from -2.5 to +1.5 than at the high and low ends of the scale. Therefore, it may be interpreted that Form B can be suitable to measure for students whose ability is $\theta = +0.2$. The expected ability distributions of the students (Form A and Form B were applied) were normally distributed across the ability scale.

Limitations of the Study

Some limitations were found in this research. The sample selection of the students for the research was confined to Yangon Region only. Moreover, this research was performed using only the Grade (10) students and Chemistry subject. And the items used in the tests are only multiple choice items. Sample size requirement is important in test equating study. Sample size has a direct effect on random equating error. According to research of Marks and Lindsay, a small sample size is discouraged because of influencing the measure of test equating error. In this study, sample size was enough to conduct linear equating but larger sample sizes were needed for IRT equating to get more accurate equating results.

But there is no guessing parameter for multiple-choice (MC) items because the sample size of this study was less than 1000, so three parameter

(3PL) model should not be applied in this study (Lord, 1968). Since the single group design was used in this study, the performances of the examinees were affected by the order the forms are administered and practice of fatigue effects due to increased testing time. The examinees took both forms at the same time in no specific order. In order to get more parallel items, the items in tests should be constructed 1-2, 3-4,5-6 ,etc, in which 1 and 2 , 3 and 4, 5 and 6 are parallel items. By doing so, the researcher can remove poor parallel items and can select good parallel items by avoiding students' guessing and fatigue effects that can face in Form B.

Suggestions and Recommendations for Further Research

Tests play an important role in today's schools and other aspects of life. Tests poorly constructed will not give accurate information about students' achievement and hence decisions based upon this kind of information will be misleading. Teachers should use table of specifications in planning and setting classroom achievement tests. So it ensures that the test possesses content validity. Since both the essay and objective types of questions are used in almost every test, teachers should study and follow the suggestions for preparing good essay and objective questions. Teachers should develop large item pools that can be of great value when used properly.

In this study on the development of parallel forms of test for Grade (10) chemistry course, the sample is limited to Grade (10) students in Yangon Region only. It may not be a representative sample of the whole Myanmar Grade 10 student population. Thus it is necessary to conduct a large-scale research in this area on the ninth standard students of all the townships and districts in Myanmar. Future researchers should develop parallel forms of tests on science course for other grades in the primary and middle school levels which will be useful whenever a test is needed urgently. Parallel forms of test should also be developed for other subjects at different levels.

It can be pointed out that four content areas classified in this research are limited in lines with the materials covered in the selected high schools. Good items recorded in this study are quite a small number. To produce a large number of good quality items which will be of great advantage for chemistry teachers, future researchers need to develop an item bank for each topic from the ninth standard chemistry course.

Under IRT, there are many methods in test equating and different models to analyze test forms. In this study, only 2 parameter logistic (PL) model was used. So, it is recommended to apply 3PL model in test equating procedures with larger sample size to reduce equating errors. As a result of IRT equating, it was found that 12 items among 40 items are assured to be parallel. In order to get more parallel items, the items in tests should be constructed 1-2, 3-4,5-6 ,etc, in which 1 and 2 , 3 and 4, 5 and 6 are parallel items to avoid students' guessing and fatigue effects that can face in Form B.

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AN ANALYSIS OF THE IMPACT OF MOTIVATION AND MOTIVATION FACTORS ON STUDENT ACADEMIC ACHIEVEMENT

Hnin Hay Man Thein[1], Moe Moe Naing[2]

Abstract

The main purpose of this study was to investigate the impact of students' motivation and motivation factors on academic achievement in a particular classroom setting. Quantitative design was used in this study. The Academic Motivation Scale, Motivation Factors Questionnaire and Academic Ability Tests were used in this study. Academic Motivation Scale consists of three subscales: intrinsic motivation, extrinsic motivation and amotivation and is composed of 27 items (α=0.838). Motivation Factors Questionnaire consists of six subscales: self-efficacy, mastery approach, mastery avoidance, performance approach, performance avoidance, and perceived instrumentality and consists of 22 items (α=0.816). To obtain the required data, a total of 1,332 students from the selected Basic Education Schools in 5 Regions and States participated in this study by using the multi-stage sampling technique. The result of t test by gender revealed that there was influence by gender for motivation and motivation factors by the whole sample. ANOVA results indicated that there were significant differences with regard to students' motivation and motivation factors by regions. The result of Tukey HSD tests were conducted and it was apparent that regions differed significantly at 0.05 level. In addition, multiple regression analysis showed that students' motivation ($F = 87.010$, $p<0.001$) and motivation factors ($F = 495.734$, $p<0.001$) were the best predictors of their academic achievement. The research on how high school students' motivation and motivation factors impact on academic achievement can give useful guidelines for the teachers to create classroom environment that can impact students' academic achievement.

Keyword: Motivation, Motivation Factors

Introduction

Everyone has the need or reason to use physical or mental effort to take work. A person who feels energized or activated to do work to an end is considered motivated, whereas someone who have no impetus or enthusiasm to involve in work may be considered unmotivated. Accordingly, everyone is

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concerned with motivation. People have not only different kinds of motivation but also different amounts of motivation. Different kinds and levels of motivation lead to different levels of achievement of the task.

Many educational researches have focused on the relations between learning environment and student motivation and cognition. Much research has shown that motivation is related with various outcomes such as curiosity, persistence, learning and performance. Many psychologists and educators have long considered students' motivation as an important factor for successful school learning (Ryan & Connell, 1989 as cited in Fadlelmula, 2010). Indeed, it is claimed that motivation is important in learning.

When the student is intrinsically motivated to learn his academic subjects, he actively participated on the teaching- learning process and well-prepared the homework. He also invested his spare time or leisure time to learn this lesson. When the student is extrinsically motivated, he study the lesson only for reward or praise. He cannot invest his leisure time more if he got the reward or praise. Most studies have shown that students' perceptions of their abilities to succeed on academic tasks and intrinsic interest in these tasks are positively associated with their academic performance (Sungur, S., & Gungoren, S., 2009). Intrinsic motivation is viewed as a more positive and stable influence on academic outcomes than extrinsic motivation, although some extrinsic motivators may be effective even over the long term (Reeve, 2006 as cited in Dalton, B. W., 2010). Thus, motivation is important for all students as it can affect learning activities.

In recent years, education professionals have been interested in one type of motivation referred to as achievement motivation, which is concerned with what, why, and how students are motivated in different learning situations. Achievement goals, also referred as "purpose goals" are related with the whys of students' learning. They are based on students' beliefs about what is important in an achievement situation (Fadlelmula, 2010).

According to Bandura, internal rewards for goal attainment can be more powerful influences on effort and achievement than external rewards such as praise or grades (Tollefson, 2000). However, for an activity a person is often not only motivated by the possible immediate intrinsic and extrinsic reasons (or goals), but also by future consequences. Perceiving the

instrumentality or utility of a present task for a future task or goal enhances motivation in comparison with a task without implications for the future (Simons, Dewittee & Lens, 2000).

Bandura (2006) also proposed that the challenges and goals people set for them are influenced by efficacy beliefs. Self-efficacy is concerned with capability. Self-efficacy plays a key role in human functioning because it not only directly affects behavior but also impacts on other determinants such as goals, expectation, and aspirations.

Literature Review

Motivation

Motivation is a term that refers to a process that elicits, controls, and sustains certain behaviors (Rani & Lenka, 2012). The term 'motivation' means to move or to energise or to activate. In psychology, the term motivation refers to those behaviours that are activated through internal mechanism of an individual (Mishra, 2014). According to Mishra, a motive may be thought as some activator that impels an individual to engage in action. Maslow (1943) said that the psychological needs or drives are usually taken as the starting point of the motivation theory.

Motivation is often used to refer to an individuals goals, needs, wants, intentions and purpose. Two terms frequently used by psychologists are drive and motive. Drive refers to motivation that is assumed to be primarily biological such as hunger. Needs can be psychological or social and are assumed to be learned through personal experience. Motives can be conscious or unconscious. Motivation is a force which results in persistent behavior directed towards a particular goal (Mishra, 2014). According to various theories, motivation may be rooted in a basic need to minimize physical pain and maximize pleasure, or it may include specific needs such as eating and resting, or a desired object, goal, state of being ideal, or it may be attributed to less-apparent reasons such as altruism, selfishness, morality, or avoiding mortality (Rani & Lenka, 2012). There are many approaches to motivation: physiological, behavioral, cognitive and social.

Anderman and Dawson (2011) posited that there are important trends in the study of motivation that have occurred, particularly during the last

century, that have shaped current theory and research in the field. These trends include the shift from behavioral to cognitive conceptions of motivation, as well as subtle and major developments within specific theories. Probably the most obvious and often discussed shift in motivational theorizing over time is the general movement from behavioral views of motivation to more cognitive and particularly social-cognitive views of academic motivation (Anderman & Dawson, 2011).

Self-determination theory (SDT) is an approach to human motivation, personality, social development, and overall psychological functioning (Ryan & Deci, 2000). The basic tenets of SDT are intrinsic and extrinsic motivation. Although controversial among some scholars, these two constructs represent parts of a continuum that consists of (a) amotivation (i.e., a complete lack of motivation), (b) four levels of extrinsic motivation (external, introjected, identified, and integrated), and (c) intrinsic motivation (Ryan & Deci, 2000). Intrinsic motivation is defined as engagement with a task fully and freely, without the necessity of material rewards or constraints (Deci & Ryan, 1985 as cited in Anderman & Dawson, 2011). In general, intrinsic motivation (IM) refers to the fact of doing an activity for itself, and the pleasure and satisfaction derived from participation (Deci, 1975; Deci and Ryan, 1985 as cited in Vellerand, Pelletire, Blais, Briere, Senecal, & Vallieres, 1992). Extrinsic motivation refers to varying degrees of engagement with a task in order to receive an external reward. The four types of extrinsic motivation describe the extent to which an individual internalizes motivation for the task; through this process, learners begin to transform internalizes motivation for the task; through this process, learners begin to transform their reasons for engaging with tasks from extrinsic to intrinsic (Deci & Ryan, 1991 as cited in Anderman & Dawson, 2011).

Motivation Factors

Within a broad framework, intrinsic/extrinsic theories, expectancy-value theory, and achievement goal theory focus on particular aspects of achievement motivation and connect motivation to certain other attitudes and perceptions (Dalton, B. W., 2010). Across these theoretical traditions, researchers describe motivation as deriving from two basic sources: interest in or enjoyment of a task or goal itself, and the value of external rewards

attached to the task or goal. The first theoretical tradition focuses on these two elemental factors themselves, identifying them as intrinsic and extrinsic motivation, and serves as a foundation for subsequent theories. The second tradition, expectancy-value theory, describes both intrinsic and extrinsic motivation as task values and incorporates them into a model that includes self-efficacy. The third tradition, achievement goal theory, parallels the intrinsic/extrinsic distinction by investigating mastery and performance goals—more specifically, academic and cognitive conceptions of motivation (Dalton, B. W., 2010).

The four of the most prominent current theoretical perspectives on achievement motivation are goal orientation theory, social cognitive theory, self-determination theory, and expectancy-value theory (Anderman & Dawson, 2011). One of the critical influences on students' choice of cognitive strategies is their motivation to learn. Three motivational factors that have been consistently related to cognitive strategy use in learning situations are self-efficacy, achievement goals, and perceived instrumentality (Greene, Miller, Crowson, Duke, & Akey, 2004).

Self-efficacy is a concept drawn from Bandura's (1977) broad theory of the person, which posits that human achievements depend on the reciprocal interactions of the person's behavior, personal factors (or self), and environmental conditions. Self-efficacy is defined as a person's beliefs about his or her ability to complete a task. Self-efficacy is one of the personal factors and is defined as "the conviction that one can successfully execute the behavior required to produce the outcomes" (Lennon, J. M., 2010). One's sense of self-efficacy can play a major role in how one approaches goals, tasks, and challenges. Self-efficacy represents the personal perception of external social factors. According to Bandura's theory, people with high self-efficacy—that is, those who believe they can perform well—are more likely to view difficult tasks as something to be mastered rather than something to be avoided.

A person's achievement goal was said to represent his or her purpose for engaging in behavior in an achievement situation (Dweck & Leggett, 1998 as cited in Elliot, 2005). For Dweck, "Achievement goals must lie at the heart of any analysis of achievement motivation" (Dweck & Elliott, 1983 as cited in Elliot, 2005). Achievement Goal Theory (also known as Goal Orientation

Theory) focuses on the reasons that students choose to engage in some tasks, and not others (Anderman & Dawson, 2011). Two types of goals were identified: performance goals, in which the purpose of behavior is to demonstrate one's competence (or avoid demonstrating one's incompetence), and learning goal, in which the purpose of behavior is to develop one's competence and task mastery (Elliot, 2005). Mastery goals have also been associated with a preference for challenging work and risk taking, an intrinsic interest in learning activities, and positive attitudes toward learning. A performance goal orientation has been associated with a pattern of motivation that includes an avoidance of challenging tasks; negative affect following failure, accompanied by a judgement that one lacks ability; positive affect following with little effort; and use of superficial or short-term learning strategies, such as memorizing or rehearsing (Ames, 1992).

Expectancy-value theory originally was described mathematically as the product of one's expectancy of attaining a given outcome and the value one placed on that outcome (Anderman & Dawson, 2011). In goal theory revision, Elliott (1999) refers to fundamental needs and perception of competence as major reasons for the goals adopted by students. Therefore, future goals, or perceived instrumentality may be considered as major concerns of students. Perceived instrumentality implies tasks as means to achieve personal goals that are considered valuable in the future (Husman & Lens, 1999; Miller & Brickman, 2004 as cited in Sedaghat, Abedin, Hejazi, & Hassanabadi, 2011). Perceived instrumentality is a goal-related variable that represents the extent to which individuals perceive task performance as instrumental to the attainment of a valued future goal (Miller, R. B., 1999). Therefore, not only motivation but also motivation factors have a great impact on students' learning and academic achievement.

Methodology

Research Design

Quantitative perspective was used in this study. Questionnaire survey method was used to measure motivation and motivation factors of Grade 8 students. Cluster sampling technique was used in this study. Individuals were selected through multistage sampling. The multistage sampling is a complex

form of cluster sampling. The multistage sampling is the probability sampling technique where in the sampling is carried out in several stages such that the sample size gets reduced at each stage (Business Jargons, 2016). In this method regions and states were firstly selected using simple random sampling and then townships were chosen randomly. Afterward, schools were chosen randomly regarding the sample size. Next, students were assigned randomly to participate in the study. The population of the present study is about 1332 grade- 8 students of Basic Education High Schools and Basic Education High Schools (Branch) from Yangon Region, Mandalay Region, Bago Region, Shan State and Mon State.

Instruments

1. Instrumentation of Motivation

Motivation is mostly measured by self-reported questionnaire (Vallerand, Pelletier, Blais, Briere, Senecal, & Vallieres, 1992). The Academic Motivation Scale (AMS), the English version of EME, assesses several types of motivation in a multidimensional fashion. These types of motivation go beyond the usual intrinsic/ extrinsic distinction and allow a finer analysis of the motivational forces in education, thereby opening the door to innovative research (Vallerand et al., 1992). There are three subscales in AMS; intrinsic motivation, extrinsic motivation, and amotivation. The Academic Motivation Scale (AMS) consists of 28 items with a four point Likert scale ranging from strongly disagree to strongly agree. The AMS instrument has been used reliably to study and measure motivation levels in elementary, high school, and undergraduate university students (Hegarty, 2010).

After that, expert review was conducted for face validity and content validity by ten experts in the field of education and educational psychology from Yangon University of Education and Department of Education Research, Planning and Training. Pilot testing was done to test the wording of items, statements and instructions had their clarity in Myanmar language and were appropriate and relevant to grade 8 students. After that, Cronbach's Alpha was run on the overall scale of AMS. The Alpha reliability for overall scale of AMS was 0.847 with 28 items. After the pilot study, the researcher removes the item number 5.

2. Instrumentation of Motivation Factors

According to Greene, B. A. (2004), self-efficacy, achievement goals, and perceived instrumentality are three motivation factors that are related to cognitive strategies use in learning. There are three subscales in Motivation Factors Questionnaire (MFQ); self-efficacy (Schwarzer & Jerusalem (1993), rev. 2000), achievement goals (Elliot and Murayama, 2008), and perceived instrumentality (Miller, DeBacker and Greene, 1999). Motivation Factors Questionnaire (MFQ) consists of 22 items with a four point Likert scale ranging from strongly disagree to strongly agree.

The expert review was also conducted for face validity and content validity. Then, pilot testing was done during 2015-2016 AY to test whether the wording of items, statements and instructions had their clarity in Myanmar language and was appropriate and relevant to grade 8 students. After that, Cronbach's Alpha was run on the overall scale of MFQ. The Alpha reliability for overall scale of MFQ was 0.846 with 22 items. In addition, revision of item length and the wording of items were also made. After the pilot study, the researcher revises the item number 1, 15, and 18.

Data Analysis and Results

1. Motivation of Students

The Academic Motivation Scale was composed of three subscales. Therefore, the researcher conducted a comparative study for three subscales of motivation. Descriptive analysis for AMS are shown in the following table 1 to figure out obviously the strength of the subscales of motivation.

Table 1: Means and Standard Deviations of the Subscales of Motivation

Subscale	Mean	Mean Percent	SD
Intrinsic motivation	37.63	47.55%	5.467
Extrinsic motivation	35.95	45.42%	4.969
Amotivation	5.56	7.03%	2.198
Motivation (The Whole Test)	78.94	100%	9.692

Based on the descriptive statistics shown in table 4.1 and figure 4.1, the mean percent score for intrinsic motivation is the highest among grade 8 students. It can be said that students had more intrinsic motivation than

extrinsic motivation. Moreover, students had little amount of amotivation in learning academic subjects. So it is apparent that students have intrinsic or extrinsic motivation to learn in school. They are motivated to learn something new in school as they are interested in the academic subjects or are forced by praise or reward by their parents or teachers. It can be seen that most of Myanmar children have high motivation to attend schools by different reasons or goals.

1.1 Motivation of Students by Gender

Since it is assumed that there might be differences in motivation with regard to gender, analyses were again conducted to confirm this assumption. Descriptive analysis revealed the differences in means and standard deviations of motivation between gender with respect to each motivation area respectively (see table 2).

Table 2: The Result of the Subscales of Motivation by Gender

	Gender	**N**	**Mean**	**SD**	***t***	***df***	***p***	**MD**
Intrinsic Motivation	Male	578	36.75	5.667	-5.246***	1330	0.000	-1.570
	Female	754	38.32	5.211				
Extrinsic Motivation	Male	578	35.24	5.113	-4.620***	1330	0.000	-1.259
	Female	754	36.49	4.787				
Amotivation	Male	578	6.02	2.479	6.842***	1330	0.000	0.817
	Female	754	5.20	1.882				
Total	Male	578	78.00	9.915	-3.798***	1330	0.000	-2.012
	Female	754	80.01	9.358				

***. $p<0.001$

The results of t-test confirmed that there was statistically significant difference between genders on the subscales of Intrinsic Motivation, Extrinsic Motivation and Amotivation. The female students had more intrinsic motivation (t = 5.246, p = .000) and extrinsic motivation (t = 4.620, p = 0.000) to learn the academic subjects than male students. Nolen (1988) examined eighth-grade students' reasons for studying science and reported that girls were slightly more interested than boys in studying science because they wanted to learn something new and to master something difficult. Also, Mubeen, Saeed, and Arif (2013) stated that female science students were somewhat better in their intrinsic motivation towards science than male.

Therefore, the results of the study are congruent with the research of Nolen (1988) and Mubeen, et al., (2013).

It was seen that students' amotivation level was quite low and also found that amotivation level of female and male students differed significantly ($t = 6.842$, $p = 0.000$), and this difference in favour of female students. So, it can be concluded that Myanmar female students have higher level of motivation than male students. The results concerning gender differences were also consistent with Vallerand, Pelletier, Blais, Briere, Senecal, and Vallieres (1992) found that females reported higher levels of intrinsic and extrinsic motivation, but lower levels of amotivation than male.

1.2 Motivation of Students by Regions

In the present research, the samples were selected from different Basic Education Schools in 5 Regions and States, but also a variety of demographic factors and socioeconomic status. Therefore, the researcher conducted a comparative study of motivation among 5 regions. Descriptive analysis revealed the differences in means and standard deviations of students' motivation among regions respectively.

According to discriptive analysis, the mean score of the motivation of the students in Yangon Region was the highest and those of the students in Shan State was the lowest among the regions and states. However, it can be seen that the mean values of each region and state had a slight difference in comparison with other regions and states (see table 3).

Table 3: Means and Standard Deviations of Motivation by Regions

	Regions	**No. of Students**	**Mean**	**SD**
Motivation	Yangon Region	281	80.52	9.674
	Bago Region	261	78.39	10.329
	Mandalay Region	300	78.78	9.922
	Shan State	246	76.24	9.817
	Mon State	244	78.54	10.046
	Total	1332	78.56	10.032

It can be seen that there were differences in motivation among regions (see figure 4.3). In order to obtain more detailed information on the difference

of students' motivation among regions, one way analysis of variance (ANOVA) was conducted. According to ANOVA results, there was significant difference at 0.001 level within groups (F= 6.130, *p*= 0.000). To get more specific difference, Tukey HSD test was used. It stated that the regions differed significantly in motivation scale at 0.05 level (see table 4).

Table 4: The Results of Tukey HSD Multiple Comparison for Motivation of Students by Regions

(I) region	(J) region	MD (I-J)	SE	*p*
Yangon Region	Shan State	4.284*	.869	.000
Mandalay Region	Shan State	2.548*	.856	.025

*$p<0.05$

Table 4 revealed that Yangon and Mandalay Regions were differed significantly with Shan State at 0.05 level. Although the schools were selected randomly from 5 regions and states, Yangon and Mandalay Regions were the most developed regions in Myanmar. It can be said that the students from Yangon and Mandalay Regions have been motivated by several factors than those in Shan State. Moreover, the socio-economic status of the students from Yangon and Mandalay Regions may be higher or they have more opportunities to learn than those from Mon and Shan States. So, it became clear that the socio-economic factors effected the students' motivation.

2 Motivation Factors of Students

Motivation factors are self-efficacy, achievement goals and perceived instrumentality. The questionnaire for students' motivation factors was composed of six subscales: self-efficacy, mastery approach goal, mastery avoidance goal, performance approach goal, performance avoidance goal and perceived instrumentality. Therefore, the researcher conducted a comparative study for six subscales of motivational factors. Descriptive analysis revealed the differences in means and standard deviations for six subscales of motivation factors.

Table 5: Means and Standard Deviations of the Subscales of Motivation Factors

Subscale	Mean	Mean Percent	SD
self-efficacy	15.06	23.80%	2.308
mastery approach goal	10.01	15.82%	1.439
mastery avoidacnce goal	8.33	13.17%	2.096
performance approach goal	9.65	15.25%	1.527
performance avoidance goal	10.45	16.52%	1.688
perceived instrumentality	9.77	15.44%	1.501
motivational factors (the whole test)	63.26	100%	7.280

Based on the descriptive statistics shown in table 5, the mean percent score for self-efficacy is the highest among other subscales. It can be said that self-efficacy factor is more dominant than the others and the mean percent score of performance-avoidance is the second highest. So it can be assumed that students believe their abilities to get achievement in learning. However, the students have the goal of trying not to be the worst or look stupid or dumb relative to others because the performance-avoidance factor is secondly higher than other achievement goal factors. Also, it is probable that they are motivated to do to the best relative to the others and have high interest in learning. They have confidence to deal effectively with unexpected events. In other word, they believe that they can stick to their aims and accomplish their goals. Most of students imply tasks as a means to attain personal goals that are valuable in the future but they have tendency to avoid learning the things that they have not mastered or orient not getting wrong.

2.1 Motivation Factors of Students by Gender

Based on the results of t-test, motivation factors were influenced by gender. Significant differences were found in motivation factors by gender in each subscale. Descriptive statistics was also used to find gender differences in motivation factors (see table 6).

Table 6: The Results of the Subscales of Motivation Factors by Gender

	Gender	**N**	**Mean**	**SD**	***t***	***df***	***p***	**MD**
Self-efficacy	male	578	14.85	2.483	-2.895**	1330	0.004	-0.368
	female	754	15.22	2.153				
Mastery-approach	male	578	9.68	1.581	-7.582***	1330	0.000	-0.591
	female	754	10.27	1.262				
Mastery-avoidance	male	578	8.33	2.130	0.059	1330	0.373	0.007
	female	754	8.32	2.071				
Performance-approach	male	578	9.26	1.624	-8.242***	1330	0.000	-0.679
	female	754	9.94	1.379				
Performance-avoidance	male	578	10.11	1.813	-6.497***	1330	0.000	-0.597
	female	754	10.71	1.537				
Perceived instrumentality	male	578	9.54	1.595	-4.759***	1330	0.000	-0.392
	female	754	9.94	1.403				

.p<0.01, *. p<0.001

The results of t-test confirmed that there was statistically significant difference between genders on most of the subscales of motivation factors apart from mastery avoidance subscale. It was found that the mean scores of self-efficacy, mastery-approach, performance-approach, performance-avoidance and perceived instrumentality level of female were slightly higher than male students. The results on these subscales were significant at 0.001 level. No statistically significant difference between male and female students was found for mastery avoidance.

Martin (2007) examined gender differences in scores on the motivation in over 12,000 students and found that girls scored significantly higher than boys in many adaptive aspects of motivation (e.g., valuing of school, mastery orientation (learning focus), planning, task management and persistence (Bugler, McGeown & StClair-Thompson, 2015). Therefore, the results of the study are congruent with the research of Martin (2007). Ablard and Lipschultz (1988) carried out a study and found that girls are higher at learning goals (mastery goals) but they did not find difference on performance goals (Tahir, Ghayas, & Adil, 2012).

2.2 Motivation Factors of Students by Regions

Since the samples were selected from different Basic Education Schools in 5 Regions and States, the researcher conducted a comparative study of motivation factors among 5 regions. Descriptive analysis revealed the differences in means and standard deviations of students' motivation factors among regions respectively (see table 7).

Table 7: Means and Standard Deviations of Motivation Factors by Regions

	Regions	No. of Students	Mean	SD
Self-efficacy	Yangon Region	281	15.55	2.038
	Bago Region	261	15.48	2.252
	Mandalay Region	300	15.43	2.287
	Shan State	246	14.72	2.423
	Mon State	244	13.92	2.132
	Total	1332	15.06	2.308
Achievement Goal	Yangon Region	281	38.86	4.488
	Bago Region	261	39.01	4.511
	Mandalay Region	300	39.48	4.492
	Shan State	246	37.30	4.981
	Mon State	244	37.19	4.947
	Total	1332	38.44	4.759
Perceived Instrumentality	Yangon Region	281	9.90	1.519
	Bago Region	261	10.18	1.316
	Mandalay Region	300	10.09	1.268
	Shan State	246	9.39	1.576
	Mon State	244	9.14	1.572
	Total	1332	9.77	1.501
Motivation Factors (The Whole Test)	Yangon Region	281	64.32	6.531
	Bago Region	261	64.67	6.835
	Mandalay Region	300	65.00	6.805
	Shan State	246	61.41	7.707
	Mon State	244	60.25	7.384
	Total	1332	63.26	7.280

It can be observed that there were differences in motivation factors among schools (see table 7). The mean score of the self-efficacy of the students in Yangon Region was the highest among the regions and states. It was also found that the mean score of the achievement goal of the students in Mandalay Region was the highest and the mean score of the perceived instrumentality of the students in Bago Region was the highest among regions and states. However, the mean scores of the students in Mon State was the lowest in the three subscales of the motivation factors among the regions and states.

In order to obtain more detailed information on the difference of students' motivation factors among schools, one way analysis of variance (ANOVA) was conducted. According to ANOVA results, there was significant difference at 0.001 level within groups (F= 24.198, *p*= 0.000). To get more specific difference, Tukey HSD test was used. It showed that Basic Education Schools differed significantly in motivation factors scale at 0.05 level (see table 8).

Table 8: The Results of Tukey HSD Multiple Comparison for Motivation Factors of Students by Regions

(I) region	(J) region	MD (I-J)	SE	*p*
Yangon Region	Shan State	2.902*	.615	.000
	Mon State	4.071*	.616	.000
Bago Region	Shan State	3.260*	.625	.000
	Mon State	4.428*	.627	.000
Mandalay Region	Shan State	3.582*	.605	.000
	Mon State	4.751*	.607	.000

*. $p < 0.05$

Table 8 revealed that motivation factors of students in Yangon, Bago and Mandalay Regions differed significantly with those in Mon and Shan States. It can be seen that significant differences were found among regions and states. It was probable that the students from 3 regions (Yangon, Bago and Mandalay) have been motivated by several factors or have higher socio-economic status than the others from 2 states (Mon and Shan). It can be assumed that the students' socio-economic factors have an impact on students' self-efficacy, achievement goal and perceived instrumentality.

3: Relation among Motivation, Motivation Factors and Academic Achievement

Table 9 showed the correlation matrix for the variables such as motivation, motivation factors and academic achievement (see table 9).

Table 9: Correlation Matrix among Motivation, Motivation Factors and Academic Achievement

	IM	**EM**	**AM**	**SE**	**MAP**	**MAV**	**PAP**	**PAV**	**PI**
AA	0.247***	0.170***	-0345***	0.808***	0.623***	-0.012	0.508***	0.198***	0.496***

***. $p<0.001$

where, AA = Academic Achievement
IM = Intrinsic Motivation
EM = Extrinsic Motivation
AM = Amotivation
SE = Self-Efficacy
MAP = Mastery Approach
MAV = Mastery Avoidance
PAP = Performance Approach
PAV = Performance Avoidance
PI = Perceived Instrumentality

It can be seen from table 9 that there is a strong correlation among motivation, motivation factors and academic achievement at 0.001 level. It can be found that there was a strong correlation between self-efficacy and academic achievement. There was also a strong correlation between mastery approach goal and academic achievement. Moreover, it was found that there was a negative correlation between amotivation and academic achievement. However, there was no correlation between mastery avoidance goal and academic achievement. So, the regression analysis was used to find the prediction of motivation and motivation factors.

Table 10: Regression Analysis for Predicting Academic Achievement from Motivation

Variables	**B**	**β**	***t***	**R**	**R^2**	**Adj R^2**	**F**
Academic Achievement	2.694						
Intrinsic Motivation	0.029	0.253	7.083***	0.407	0.166	0.164	87.946***
Extrinsic Motivation	-0.007	-0.055	-1.533				
Amotivation	-0.093	-0.327	-12.905***				

*p****<0.001

It can be seen that a total of 16.6% of the variance in academic achievement was accounted for by the motivation scale in this model (see table 10). In the following regression analysis, academic achievement scale was measured using the subscales of motivation which had the Tolerance value of above 0.488.

From the above table 4.11 Academic Achievement (AA) can be predicted from Intrinsic Motivation (IM), Extrinsic Motivation (EM) and Amotivation (AM). Intrinsic motivation was able to account for 25.3% of the variance in academic achievement. Amotivation was able to predict 32.7% of the variance in academic achievement. Then the model can be defined as the following equation:

$$AA = 2.694 + 0.29\ IM - 0.093\ AM$$

These findings showed that academic achievement is dependent on intrinsic motivation and amotivation. Therefore, students' motivation was the best predictor for their academic achievement. Thus, students who have high intrinsic motivation may have high academic achievement. However, students who have high amotivation may have low academic achievement.

According to Wigfield and Eccles (2002), numerous research studies have shown that intrinsically motivated students have higher achievement levels than students who are not intrinsically motivated (Saeed & Zyngier, 2012). Most studies demonstrate that there is a positive correlation and between intrinsic motivation and academic achievement (Saeed & Zyngier,

2012). Consistent with the research by Aye Thida Soe (2012), students' motivational strategies played an important role in geography concept understanding and the results also confirmed that extrinsic goal orientation cannot predict students' conceptual understanding.

Table 11: Regression Analysis for Predicting Academic Achievement from Motivation Factors

Variables	B	β	*t*	R	R^2	Adj R^2	F
Academic Achievement	-0.341						
Self-efficacy	0.182	0.671	30.804***	0.832	0.692	0.690	495.734***
Mastery Approach	0.095	0.219	9.895***				
Performance Approach	0.022	0.054	2.705***				
Performance Avoidance	-0.044	-0.118	-6.421***				
Perceived Instrumentality	0.007	0.016	0.805				

*p****<0.001

It can be seen that a total of 69.2% of the variance in academic achievement was accounted for by the motivation factors scale in this model (see table 11). In the following regression analysis, academic achievement was measured using the subscales of motivation factors which had the Tolerance value of above 0.476.

From the above table 4.25 Academic achievement (AA) can be predicted from Self-Efficacy (SE), Mastery Approach (MAP), Performance Approach (PAP), Performance Avoidance (PAV), and Perceived Instrumentality (PI) . Self-efficacy was able to account for 67.1% of the variance in academic achievement. Mastery approach (MAP) accounted for 21.9% of the variance in academic achievement. Performance approach (PAP) accounted for 5.4% of the variance in academic achievement. Performance avoidance (PAV) was able to predict 11.8% of the variance in academic achievement. Perceived instrumentality was accounted for 1.6% of the variance in academic achievement. Then the model can be defined as the following equation:

$$AA = 0.341 + 0.182\ SE + 0.095\ MAP + 0.22\ PAP - 0.44\ PAV$$

These findings showed that academic achievement is dependent on self-efficacy, mastery approach, performance approach and performance avoidance. Therefore, students' motivation factors were the best predictors for their academic achievement. Thus, students who have high self-efficacy, mastery approach, and performance approach may have high academic achievement. However, students who have high performance avoidance may have low academic achievement.

According to Rostami, Hejazi, and Lavasani (2011), approach-performance goals positively and avoidance-performance goals negatively have relationships with academic achievement. Thety indicated that perceived instrumentality and achievement goals can predict academic achievement.

The relationship model of the impact of motivation and motivation factors on academic achievement was shown in figure 1.

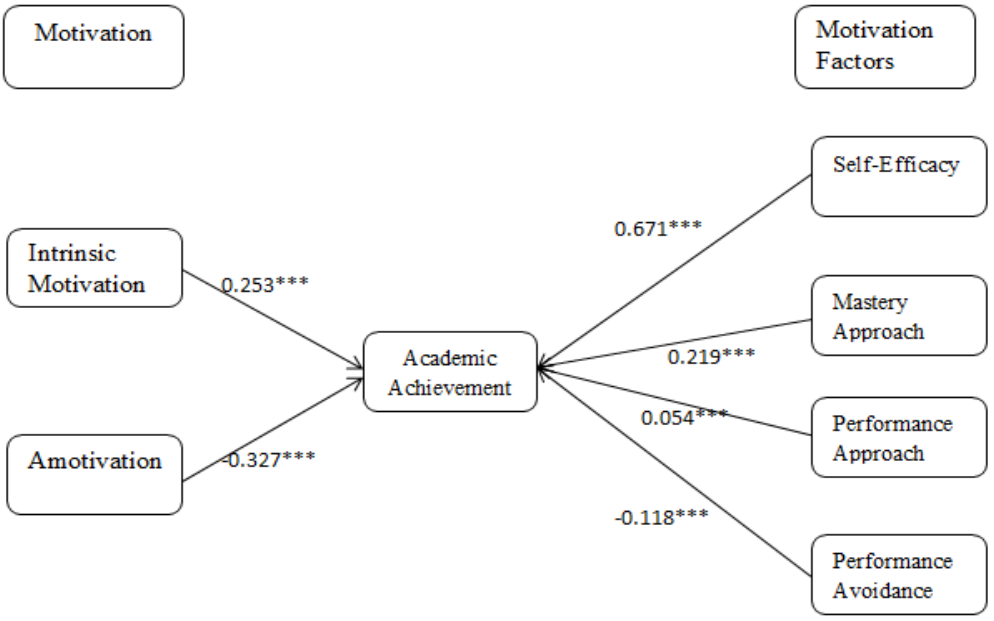

Figure 1: Relationship Model of the Impact of Motivation and Motivation Factors on Academic Achievement

Conclusion and Discussion

In education, motivation plays a crucial role in the performance of students. All students need motivation to attend school and to learn academic subjects. Student motivation has been described as one of the foremost problems in education. It is certainly one of the problems most commonly cited by teachers. Motivation is important because it contributes to achievement, but it is also important itself as an outcome (Ammes, 1990). The teacher should notice the motivation the students have and this will help the teacher in their teaching- learning process and building student-teacher relationship and creating positive learning environment.

Education plays a vital role in shaping tomorrows' leaders. It can become a better nation by acquiring the skills necessary to be productive members of a civilized society. Through education, the knowledge of society, country, and the world is passed on from one generation to generation. So, education is necessary for each individual to improve their lives, to promote their society and to contribute to the nation. Myanmar society has traditionally valued and stressed the importance of education. The mottoes such as "Every school-age child in school" and "Education for All" guide Myanmar's educational efforts. However, education is often criticised in the press in Myanmar and there is still many challenges to become a better learning environment.

The National Education Strategic Plan (NESP) is an ambitious road map for a first phase of reform in Myanmar that aims to improve teaching, learning and inclusion on all education levels, from kindergarten to universities. Some major proposed measures include extending basic education with two years to a total of 13, and the introduction of new curricula, child centered learning and more interactive classrooms. The results form this study can contribute to the basic education teachers as it can provide the importance of students' motivation and its effect on the academic achievement.

Suggestion for Future Research

This investigation highlights the importance of students' motivation and motivation factors in the classroom and their impacts on the academic achievement. A limitation with the research design was that it was cross-sectional. This design was limited the ability to assess motivation and motivation factors overtime. In the study of motivation and motivation factors, longitudinal and experimental research may be better because they are the difficult psychological attributes to measure and they cannot be developed during a short period of time, and also the effect of intervention programme can be investigated.

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TEACHERS' PERCEPTIONS, BELIEFS AND PRACTICES OF STUDENT MOTIVATION

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Abstract

The purpose of this research was to examine teachers' perceptions, beliefs and practices of student motivation. Descriptive survey method and quantitative approach were used in this study. The Perceptions of Student Motivation (PSM), Motivating Students Questionnaire (MSQ), Theoretical Beliefs and Practices (TBP) questionnaires of Hardre, Davis and Sullivan's (2008) were used for data collection. Seven point Likert scales were used to respond these questionnaires. A total of 600 in-service teachers (JAT and SAT) from Ayeyarwaddy Region involved in this study. After conducting a pilot study with 50 in-service teachers in November, 2017, collecting data was completed in December, 2017. The results showed that the JAT has the perception of student's motivation more than SAT in this study. And JATs' theoretical belief and practices for student motivation were higher than that of SATs. For the perception of student motivation, Pathein and Phyapone Districts were higher than the other Districts. And then Myaungmya and Phyapone Districts were more than Pathein District for the use of motivating strategies. In theoretical beliefs and practices of student motivation, Myaungmya and Phyapone Districts were higher than that of the other Districts. In teachers' perception of student motivation, in-service teachers were not different to their age level. ANOVA results revealed that 51-60 age group of in-service teacher were higher than that of the others for the use of motivation strategies and theoretical belief and practices for student motivation. Multiple regression analysis pointed teachers' theoretical beliefs and practices can predict teachers' motivating students and perception of student motivation.

Keyword: Motivation, Teaching Practices, Perception, Teachers' Beliefs, Beliefs

Introduction

Teachers' beliefs and practices are important for understanding and improving educational processes. They are closely linked to teachers' strategies for coping with challenges in their daily professional life and they shape students' learning environment and influence student motivation and

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achievement. Motivation in education can be summarized as a student's willingness to undertake and persist in challenging tasks, seek help, and endeavor to perform in school (Meece, Anderman, & Anderman, 2006). An understanding of these beliefs and perceptions and how they relate to strategies and motivating behaviors is necessary to understand student motivation. In the classroom, teachers will invest in motivating behaviors if they believe student motivation to be malleable that is changeable under their influence. Student achievement influences teacher's judgment of motivation and these judgment influences teachers' use of motivational strategies.

Purpose of the Study

The main purpose of the study was to examine of teachers' perceptions, beliefs and practices of student motivation.

Definition of Key Terms

Perception: Perception is the action of seeing and perceiving through the sensory organs. It is a process of perceiving, discriminating and transmitting stimuli from the surrounding through human sensory organs, interpreting and storing them in the brain. It can be in the form of image, imagination, thinking, opinion, idea or impression (Mok Soon Sang, 2003).

Beliefs: Belief is a proposition which may be consciously or unconsciously held, is evaluative in the sense that it is accepted as true by individuals, and is therefore imbued with emotive commitment; further, it serves as a guide to thought and behavior (Borg, 2001).

Review of Related Literature

Many young children begin school with a thirst for learning. They enthusiastically and curiously seek novel or challenging tasks. It can be concluded then that young children begin school intrinsically motivated. When studying motivation, it is useful to distinguish between two basic orientations: Intrinsic (or Mastery) versus Extrinsic (or Performance) orientation towards learning (Goldberg, 1994).

A good amount of evidence has been gathered indicating teachers' beliefs, expectations, and perceptions impact student achievement (Jussim et al., 2009). Beliefs are the convictions one has about the truth. For teachers, these beliefs might be most pertinent to their teaching, student learning, students, and the educational process. Expectations are the anticipatory beliefs, and might include such preconceived ideas such as the common idea that students who do not study are not motivated. Although there may be a myriad of reasons as to why a student does not study before a big test, this preconceived assertion that lack of studying equals lack of motivation rises to the top as the most likely explanation for the non-studying behavior.

Perceptions are the observable information teachers receive that create or reinforce their beliefs and expectations. A teacher may see students do poorly on tests and attribute their behavior to a lack of motivation. Further, some teachers may be able to accurately assess students' abilities, they are nowhere near perfect. Preconceived beliefs and expectations can be skewed by perceptions which can significantly impact student achievement outcomes.

Teachers may also adopt firm beliefs about their students based on knowledge of certain background information such as previous achievement, a history of behavior referrals, or even knowledge of the student's siblings. If a teacher has received previous information that a student is unmotivated, the teacher may expect less from that student and treat him or her in a way that supports this belief that the student is unmotivated. It is more likely that each tardy, late assignment or low grade will be viewed through the lens of poor motivation rather than considering alternative possibilities. Moreover, many of these beliefs and expectations are formed well before students set foot in a classroom.

Learning to read is an important activity in school. Teachers have different beliefs as to student motivation and its relationship to reading success. Quirk et al. (2010) found teachers endorsed intrinsic motivation towards reading as preferable to extrinsic motivation. Teachers who endorsed more intrinsic approaches to motivating their students also indicated a higher level of self-efficacy to instruct and engage students in general. Teachers who thought particular students were good readers also made positive assumptions regarding those students' preparedness for class (Bozack, 2011).

Teachers' perceptions of student motivation do not strongly relate to their choice of motivational strategies except when teachers perceive their students as not amenable to influence. Instead, belief as to the etiology of the students' motivational difficulties was more influential in their choice and application of motivational strategies (Hardre & Sullivan, 2008).

In terms of having influence over student motivation, Hardre and Sullivan (2008) also found that these teachers viewed the students as more in control of their motivational success or failure and themselves as having less influence. They perceived student motivation to be highest when the students cared about learning and about one another. However, they did not indicate that creating supportive climates and utilizing an autonomy-supportive style promote student motivation. Of significance is the finding indicating that these teachers perceive themselves as having less influence on student motivation than the students themselves. This finding is in direct contrast to the research that suggests environment and interpersonal style efforts do make a significant difference in student motivational behaviors (Anderman & Wolters, 2006; Ryan & Deci, 2002).

In general, when compared to female teachers, male teachers perceived students to be more motivated and elementary-school teachers endorsed higher motivation for their students than endorsed by high-school teachers (Martin, 2006). Further, teachers' age and experience did not predict motivational strategy use or self-efficacy for motivating students (Hardre & Sullivan, 2008).

Method

The perceptions, beliefs and practices to student motivation of in- service teachers were examined by using questionnaire survey method.

Participants of the Study

Participants of this study were 600 in- service teachers (both male and female) from Ayeyarwady Region in the academic year of 2017-2018.

Instruments and Data Collection Procedure

The Perceptions of Student Motivation (PSM), Motivating Students Questionnaire (MSQ), Theoretical Beliefs and Practices (TBP) questionnaires of Hardre, Davis and Sullivan's (2008) were used for data collection. The Perceptions of Student Motivation (PSM), Motivating Students Questionnaire (MSQ), Theoretical Beliefs and Practices (TBP) questionnaires of Hardre, Davis and Sullivan's (2008) were used for data collection. After modifying the required instrument and applying it for data collection, teachers' perceptions, beliefs and practices to student motivation were investigated among the selected schools from Ayeyarwady Region during December, 2017.

Findings

Table 1: Descriptive Analysis for Teachers' Perception of Student Motivation by Rank

Subscales of PSM	Rank	N	SD	Mean	Mean%
Motivation	JAT	300	4.924	31.45	64.18%
	SAT	300	5.319	30.27	61.78%
Reason	JAT	300	15.520	57.81	63.53%
	SAT	300	13.739	60.00	65.93%

Note: PSM= Perception of Student Motivation, JAT= Junior Assistant Teachers, SAT= Senior Assistant Teachers

According to data analysis, Junior Assistant Teachers (JAT) was better than Senior Assistant Teachers (SAT) at the motivation. Early adolescents may be easier to motivate than later adolescents.

Table 2: Results of Independent Sample *t*-test for Perception of Student Motivation by Rank

Subscales of PSM	*t*	*df*	Sig (2-tailed)	Mean Difference
Motivation	**2.828****	598	**0.005**	1.183
Reason	-1.830	598	0.068	-2.190

Note: PSM= Perception of Student Motivation

According to the above table, Junior Assistant Teachers (JAT) may be more effective to help their students feel motivated to learn and to achieve. The results showed that there was no significant rank difference for the perception of student motivation.

Table 3: Descriptive Analysis for Perception of Student Motivation by District

Subscales of PSM	District	N	SD	Mean	Mean%
Motivation	Hinthada	100	4.788	31.16	63.59%
	Myaungmya	100	5.705	30.57	62.39%
	Pathein	100	4.081	31.78	64.86%
	Mawgyun	100	4.501	30.04	61.31%
	Phyapone	100	5.811	31.70	64.69%
	Maubin	100	5.593	29.90	61.02%
Reason	Hinthada	100	16.301	58.47	64.25%
	Myaungmya	100	17.620	58.83	64.65%
	Pathein	100	10.540	59.90	65.82%
	Mawgyun	100	11.532	59.22	65.08%
	Phyapone	100	15.310	60.66	66.66%
	Maubin	100	15.463	56.35	61.92%

Note: PSM= Perception of Student Motivation

It was clearly seen that the mean percentages of in-service teachers from Pathein District in motivation was higher than that of in-service teachers from other Districts. But, for the reason, the mean percentages of in-service teachers from Phyapone District were higher than that of in-service teachers from other Districts.

In order to investigate whether student teachers are different in the perception of student motivation by District, one way analysis of variance (ANOVA) was conducted and the result findings were presented in Table 4.

Table 4: ANOVA Results of Perception of Student Motivation by District

Subscales of PSM		Sum of Square	*df*	Mean Square	*F*	*p*
Motivation	Between Group	332.008	5	66.402	**2.530***	**.028**
	Within Group	15586.950	594	26.241		
Reason	Between Group	1089.215	5	217..843	1.010	.411
	Within Group	128084.370	594	215.630		

Note: PSM= Perception of Student Motivation

Table 5: Descriptive Analysis for Teachers' Perception of Student Motivation by Age

Subscales of PSM	Age	N	SD	Mean	Mean%
Motivation	21-30	34	4.257	31.76	64.82%
	31-40	123	5.434	30.82	62.90%
	41-50	138	5.481	30.94	63.14%
	51-60	305	4.990	30.73	62.71%
Reason	21-30	34	10.985	60.15	66.10%
	31-40	123	14.510	60.50	66.48%
	41-50	138	15.481	58.70	64.51%
	51-60	305	14.752	58.22	63.98%

Note: PSM= Perception of Student Motivation

The in-service teachers are not different in teachers' perception of student motivation to their age level.

Table 6: Descriptive Analysis of Teachers' Self- Efficacy, Beliefs and Use of Motivating Strategies for Student Motivation

Subscales of MS	N	SD	Mean	Mean %
Teachers' Self- Efficacy	600	7.471	37.01	75.53%
Teachers' Beliefs	600	5.902	35.20	83.81%
Use of Motivating Strategies	600	13.689	101.83	76.56%

Note: MS= Motivating Students

The number of items in the factors of motivating students was not equal so, mean scores were changed to mean percentages. According to the findings, the mean percentages of teachers' beliefs were higher than that of teachers' self- efficacy and use of motivating strategies. It can be concluded that in-service teachers adopted teachers' beliefs more than teachers' self-efficacy and use of motivating strategies for their motivating student in the classroom. Therefore, teachers' beliefs might be most pertinent to their teaching, student learning, students, and the educational process.

Table 7: Descriptive Analysis of Teachers' Self- Efficacy, Beliefs and Use of Motivating Strategies for Student Motivation by Rank

Subscales of MS	Ranks	N	SD	Mean	Mean %
Teachers' Self-Efficacy	JAT	300	7.910	38.17	77.90%
	SAT	300	6.821	35.84	73.14%
Teachers' Beliefs	JAT	300	5.716	36.24	86.29%
	SAT	300	5.913	34.17	81.36%
Use of Motivating Strategies	JAT	300	13.224	104.93	78.89%
	SAT	300	13.465	98.73	74.23%

Note: JAT= Junior Assistant Teachers, SAT= Senior Assistant Teachers
MS= Motivating Students

It was observed that the mean percentages of teacher' self-efficacy, beliefs and use of motivating strategies from Junior Assistant Teachers (JAT) were slightly higher than that of Senior Assistant Teachers (SAT). The junior assistant teacher might more apply various devices in the classroom to motivate their children.

To obtain more detail information of teachers' self- efficacy, beliefs and use their strategies for student motivation by ranks, independent sample *t*-test was made. Visual presentation for this finding was showed in following Table 8.

Table 8: Result of Independent Sample *t*-test for Teachers' Self- Efficacy, Beliefs and Use of Motivating Strategies for Student Motivation by Rank

Subscales of MS	*t*	*df*	Sig (2-tailed)	Mean Difference
Teachers' Self-Efficacy	**3.869*** **	598	0.000	2.333
Teachers' Beliefs	**5.687*** **	598	0.000	6.197
Use of Motivating Strategies	**4.359*** **	598	0.000	2.070

Note: MS= Motivating Students

According to the Table 8, the results of the *t*-test confirmed that significant differences were found on the whole test as well as teachers' self-efficacy, beliefs and use their strategies for student motivation of in- service teachers at 0.001 levels. This may be interpreted that Junior Assistant Teachers (JAT) possessed more teachers' self-efficacy, beliefs and use their strategies for student motivation than Senior Assistant Teachers (SAT).

Table 9: Descriptive Analysis of Teachers' Self- Efficacy, Beliefs and Use of Motivating Strategies for Student Motivation of In- Service Teachers by District

Subscales of MS	District	N	SD	Mean	Mean%
Teachers' Self-Efficacy	Hinthada	100	9.234	36.26	74.00%
	Myaungmya	100	7.247	36.90	75.31%
	Pathein	100	6.321	36.10	73.67%
	Mawgyun	100	6.573	37.75	77.04%
	Phyapone	100	7.788	38.00	77.55%
	Maubin	100	7.294	37.03	75.57%
Teachers' Beliefs	Hinthada	100	5.640	35.03	83.40%
	Myaungmya	100	5.907	36.40	86.67%
	Pathein	100	6.160	34.51	82.17%
	Mawgyun	100	5.378	35.22	83.86%
	Phyapone	100	6.287	35.70	85.00%
	Maubin	100	5.894	34.35	81.79%

Subscales of MS	District	N	SD	Mean	Mean%
Use of Motivating Strategies	Hinthada	100	15.688	100.96	75.91%
	Myaungmya	100	12.891	103.44	77.77%
	Pathein	100	13.046	97.75	73.50%
	Mawgyun	100	12.126	102.76	77.26%
	Phyapone	100	15.278	104.98	78.93%
	Maubin	100	11.803	101.10	76.02%

Note: MS= Motivating Students

One way analysis of variances (ANOVA) was used to examine the significant differences of approaches to teachers' self-efficacy, beliefs and use their strategies for student motivation of in- service teachers. According to the results of the Table 10, there was a significant difference in use of motivating strategies at 0.05 levels.

Table 10: ANOVA Result of Teachers' Self- Efficacy, Beliefs and Use of Motivating Strategies for Student Motivation of In- Service Teachers by District

Subscales of MS		Sum of Square	*df*	Mean Square	*F*	*p*
Teachers' Self-Efficacy	Between Groups	293.073	5	58.615	1.051	.387
	Within Groups	33142.900	594	55.796		
Teachers' Beliefs	Between Groups	291.788	5	58.358	1.685	.136
	Within Groups	20574.810	594	34.638		
Use of Motivating Strategies	Between Groups	3131.568	5	626.314	**3.409***	**.005**
	Within Groups	109122.430	594	183.708		

Note: MS= Motivating Students

To obtain more detail information which regions had the differences, the Post-Hoc Test was carried out by Tukey method. Results revealed that in-

service teachers of Myaungmya District uses of motivating strategies more than in-service teachers of Pathein District. In- service teachers of Phyapone District applied more uses of motivating strategies than in-service teachers of Pathein District.

Table 11: Results of Tukey HSD Multiple Comparison for Use of Motivating Strategies for Student Motivation of In- Service Teachers by District

Subscale of MS	(I) Grade Levels	(J) Grade Levels	Mean Difference	*p*
Use of Motivating Strategies	Myaungmya	Pathein	**5.690***	**.037**
	Phyapone	Pathein	**7.230****	**.002**

Note: MS= Motivating Students

In addition to examine the highly significant difference across Districts, Post-hoc Test was executed by Tukey Method and that it becomes apparent that the mean percentage of in-service teachers from Myaungmya District were significantly higher than that of in-service teachers from Pathein District in the test of use of motivating strategies at 0.05 level. And then the mean percentages of in-service teachers from Phyapone District were significantly higher than that of in-service teachers from Pathein District in the test of use of motivating strategies at 0.01 level. In addition, with regard to the use of motivating strategies in providing student motivation, in-service teachers of Pathein District were higher than that of Myaungmya and Phyapone Districts.

Table 12: Descriptive Analysis of Teachers' Self- Efficacy, Beliefs and Use of Motivating Strategies for Student Motivation of In- Service Teachers by Age

Subscales of Motivating Students	Age	N	SD	Mean	Mean%
Teachers' Self- Efficacy	21-30	34	6.350	36.09	73.65%
	31-40	123	7.371	36.75	75.00%
	41-50	138	7.245	36.66	74.82%
	51-60	305	7.736	37.37	76.27%
Teachers' Beliefs	21-30	34	4.519	34..62	82.43%
	31-40	123	6.657	34.36	81.81%
	41-50	138	6.233	34.96	83.24%
	51-60	305	5.524	35.72	85.05%
Use of Motivating Strategies	21-30	34	10.838	98.38	73.97%
	31-40	123	15.361	99.19	74.58%
	41-50	138	13.504	102.39	76.98%
	51-60	305	13.186	103.03	77.47%

One way analysis of variances (ANOVA) was used to examine the significant differences of teachers' self-efficacy, teachers' beliefs and use of motivation strategies by age.

Table 13: ANOVA Result of Teachers' Self- Efficacy, Beliefs and Use of Motivating Strategies for Student Motivation of In- Service Teachers by Age

Subscales of Motivating Students		Sum of Square	*df*	Mean Square	*F*	*p*
Teachers' Self-Efficacy	Between Groups	93.924	3	31.308	.560	.624
	Within Groups	33342.049	596	55.943		
Teachers' Beliefs	Between Groups	188.819	3	62.940	1.814	.143
	Within Groups	20677.780	596	34.694		
Use of Motivating Strategies	Between Groups	1745.666	3	581.889	**3.138 ***	**.025**
	Within Groups	110508.333	596	185.417		

To obtain more detail information which the ages had the differences, the Post-Hoc Test was carried out by Tukey method. Results revealed that 51-60 ages of in-service teachers applied the use of motivation strategies more than 31-40 ages of in-service teachers. These results, 51-60 ages of in-service teacher applied the use of motivation strategies because they have been experienced.

Table 14: Results of Tukey HSD Multiple Comparison for Use of Motivating Strategies for Student Motivation of In- Service Teachers by Age

Subscale of Motivating Students	(I) Grade Levels	(J) Grade Levels	Mean Difference	*p*
Use of Motivating Strategies	51-60	31-40	**3.843***	**.042**

In addition to examine the highly significant difference across ages, Post-hoc Test was executed by Tukey Method and that it becomes apparent that the mean score of 51-60 ages of in-service teachers were significantly higher than that of 31-40 ages of in-service teachers in the test of use of motivating strategies at 0.05 level.

Table 15 : Descriptive Analysis of Theoretical Beliefs and Practices for Student Motivation

Subscales of TBP	N	SD	Mean	Mean %
Relevance	600	2.722	18.64	88.76%
Beliefs	600	5.195	37.20	75.92%
Practices	600	3.119	16.47	78.43%

Note: TBP= Theoretical Beliefs and Practices

According to the findings, the mean percentages of relevance were higher than that of beliefs and practices. It can be concluded that in-service teachers applied that importance/ relevance skills more than beliefs and practices skills for their motivating students.

Table 16: Descriptive Analysis of Theoretical Beliefs and Practices for Student Motivation by Rank

Subscales of TBP	Rank	N	SD	Mean	Mean%
Relevance	JAT	300	2.333	19.32	92.00%
	SAT	300	2.916	17.97	85.57%
Beliefs	JAT	300	4.925	38.36	78.29%
	SAT	300	5.205	36.04	73.55%
Practices	JAT	300	3.057	16.94	80.67%
	SAT	300	3.113	16.00	76.19%

Note: JAT= Junior Assistant Teachers, SAT= Senior Assistant Teachers
TBP= Theoretical Beliefs and Practices

According to data analysis, Junior Assistant Teachers (JAT) was better than Senior Assistant Teachers (SAT) at the relevance skills. There were slightly differences between Junior Assistant Teachers (JAT) and Senior Assistant Teachers (SAT) at the beliefs and practices.

To seek out more detail investigation on ranks difference of in-service teachers in theoretical belief and practices for student motivation, independent sample *t*-test was made.

Table 17: Results of Independent Sample *t*-test of Theoretical Beliefs and Practices for Student Motivation by Rank

Subscales of TBP	*t*	*df*	Sig(2-tailed)	Mean Difference
Relevance	**6.231*** **	598	**.000**	1.343
Beliefs	**5.624*** **	598	**.000**	2.327
Practices	**3.745*** **	598	**.000**	0.943

Note: TBP= Theoretical Beliefs and Practices

According to the above table, the result can be interpreted that Junior Assistant Teachers (JAT) were better than Senior Assistant Teachers (SAT) at the theoretical belief and practices for student motivation.

Table 18: Descriptive Analysis for Theoretical Beliefs and Practices for Student Motivation by District

Subscales of TBP	District	N	SD	Mean	Mean%
Relevance	Hinthada	100	3.001	18.68	88.95%
	Myaungmya	100	1.967	19.03	90.62%
	Pathein	100	3.141	17.93	85.38%
	Mawgyun	100	2.354	18.95	90.24%
	Phyapone	100	3.377	18.26	86.95%
	Maubin	100	2.025	19.02	90.57%
Beliefs	Hinthada	100	5.246	36.51	74.51%
	Myaungmya	100	5.665	38.25	78.06%
	Pathein	100	5.734	36.44	74.37%
	Mawgyun	100	4.625	37.31	76.14%
	Phyapone	100	5.559	37.51	76.55%
	Maubin	100	4.026	37.18	75.88%
Practices	Hinthada	100	3.350	16.35	77.86%
	Myaungmya	100	3.054	16.22	77.24%
	Pathein	100	2.615	15.78	75.14%
	Mawgyun	100	2.878	17.11	81.48%
	Phyapone	100	3.201	17.42	82.95%
	Maubin	100	3.283	15.95	75.95%

Note: TBP= Theoretical Beliefs and Practices

It showed that the mean percentages of in-service teachers from each District of Ayeyarwaddy Region were slightly different in beliefs and practices. However, it was clearly seen that the mean percentages of in-service teachers from Myaungmya District in relevance skills and beliefs were higher than that of in-service teachers from other District. But, for the practices, the mean percentages of in-service teachers from Phyapone District were higher than that of in-service teacher from other Districts.

One way analysis of variances (ANOVA) was used to examine the significant differences of theoretical belief and practices for student motivation.

Table 19: ANOVA Result of Theoretical Beliefs and Practices for Student Motivation by District

Subscales of TBP		Sum of Square	*df*	Mean Square	*F*	*p*
Relevance	Between Groups	104.255	5	20.851	**2.857***	**.015**
	Within Groups	4335.130	594	7.298		
Beliefs	Between Groups	226.480	5	45.296	1.688	.135
	Within Groups	15937.520	594	26.831		
Practices	Between Groups	213.548	5	42.710	**4.521*****	**.000**
	Within Groups	5611.970	594	9.448		

Note: TBP= Theoretical Beliefs and Practices

To obtain more detail information which regions had the differences, the Post-Hoc Test was carried out by Tukey method. Results revealed that in-service teachers of Myaungmya District uses of relevance scale more than in-service teachers of others District. In- service teachers of Phyapone District applied more practices than in-service teachers of others Districts.

Table 20: Results of Tukey HSD Multiple Comparison for Use Their Strategies for Student Motivation of In- Service Teachers by District

Subscales of TBP	(I) Grade Levels	(J) Grade Levels	Mean Difference	*p*
Relevance	Myaungmya	Pathein	**1.100***	**.047**
	Phyapone	Pathein	**7.230****	**.002**
Practices	Mawgyun	Pathein	**1.330***	**.028**
	Phyapone	Pathein	**1.640****	**.002**
		Maubin	**1.470***	**.010**

Note: TBP= Theoretical Beliefs and Practices

In addition to examine the highly significant difference across Districts, Post-hoc Test was executed by Tukey Method and that it becomes apparent that the mean percentage of in-service teachers from Myaungmya District were significantly higher than that of in-service teachers from Pathein District in the test of relevance skills at 0.05 level. And then the mean percentages of in-service teachers from Phyapone District were significantly higher than that of in-service teachers from Pathein District in the test of relevance skills at 0.01 level. In addition, with regard to the practices of student motivation, in-service teachers of Mawgyun District were higher than that of Pathein District at 0.05 level. And then in-service teachers of Phyapone District were higher than that of Pathein District at 0.01 level and that of Maubin District at 0.05 level.

Table 21: Descriptive Analysis of Theoretical Beliefs and Practices for Student Motivation by Age

Subscales of TBP	Ages	N	SD	Mean	Mean%
Relevance	21-30	34	2.785	17.38	82.76%
	31-40	123	3.325	17.75	84.52%
	41-50	138	2.596	18.66	88.86%
	51-60	305	2.353	19.14	91.14%
Beliefs	21-30	34	3.948	35.15	71.73%
	31-40	123	6.159	35.75	72.96%
	41-50	138	5.060	37.59	76.71%
	51-60	305	4.787	37.84	77.22%
Practices	21-30	34	2.752	15.00	71.43%
	31-40	123	2.995	16.27	77.48%
	41-50	138	3.631	16.18	77.05%
	51-60	305	2.891	16.85	80.24%

Note: TBP= Theoretical Beliefs and Practices

One way analysis of variances (ANOVA) was used to examine the significant differences of theoretical belief and practices for student motivation by ages.

Table 22: ANOVA Result of Theoretical Beliefs and Practices for Student Motivation by Age

Subscales of TBP		**Sum of Square**	***df***	**Mean Square**	***F***	***p***
Relevance	Between Groups	228.238	3	76.079	**10.767*** **	**.000**
	Within Groups	4211.147	596	7.066		
Beliefs	Between Groups	547.964	3	182.655	**6.971*** **	**.000**
	Within Groups	15616.036	596	26.201		
Practices	Between Groups	133.839	3	44.613	**4.672** **	**.003**
	Within Groups	5691.518	596	9.550		

Note: TBP= Theoretical Beliefs and Practices

To obtain more detail information which the ages had the differences, the Post-Hoc Test was carried out by Tukey method.

Table 23: Results of Tukey HSD Multiple Comparison of Theoretical Beliefs and Practices for Student Motivation by Age

Subscales of TBP	(I) Grade Levels	(J) Grade Levels	Mean Difference	***p***
Relevance	41-50	31-40	**0.911***	**.030**
	51-60	21-30	**1.759** **	**.002**
		31-40	**1.393*** **	**.000**
Beliefs	41-50	31-40	**1.839***	**.020**
	51-60	21-30	**2.692***	**.020**
		31-40	**2.091** **	**.001**
Practices	51-60	21-30	**1.849** **	**.005**

Note: TBP= Theoretical Beliefs and Practices

To obtain more detail information which grade levels had the differences, the Post-Hoc Test was carried out by Tukey method. Results revealed that 51-60 ages of in-service teachers were used the test of relevance skills more than that of 21-30 ages of in-service teachers at 0.01 level and then that of 31-40 ages of in-service teachers at 0.001 level. However, 41-50 ages of in-service teachers applied relevance skills more than 31-40 ages of in-service teachers at 0.05 level. For the beliefs, 51-60 ages of in-service teachers were used the test of beliefs more than that of 21-30 ages of in-service teachers at 0.05 level and then that of 31-40 ages of in-service teachers at 0.01

level. And then, 41-50 ages of in-service teachers applied beliefs scale more than 31-40 ages of in-service teachers at 0.05 level. For the practices, 51-60 ages of in-service teachers were used the test of practices skills more than that of 21-30 ages of in-service teachers at 0.01 level.

Table 24: Inter-Correlations between Perception of Student Motivation, Motivating Students and Theoretical Beliefs and Practices Variables

Variables	Perception of Student Motivation	Motivating Students	Theoretical Beliefs and Practices
Perception of Student Motivation	1	.290**	.186**
Motivating Students		1	.644**
Theoretical Beliefs and Practices			1

**p<0.01

This result shows that a positive, moderate correlation was also found between perception of student motivation and motivating students (r=0.290, p<0.001), a weak positive correlation was also found between perception of student motivation and theoretical beliefs and practices (r=0.186, p<0.001). A further point is that motivating students correlates significantly with the theoretical beliefs and practices (r=0.644, p<0.001). So it can be interpreted that if the in-service teachers have good beliefs, self-efficacy and practices of student motivation, their motivating students will heighten.

Table 25:Multiple Regression Analysis Summary for Motivating Students

Variables	B	β	*t*	R	R^2	Adj R^2	*F*
Significant predictor of MS	27.707		**4.204****	.667	.444	.443	238.765
PSM	0.254	.177	**5.695****				
TBP	1.628	.611	**19.673****				

Note: p**<0.001

MS= Motivating Students, PSM= Perceptions of Student Motivation, TBP= Theoretical Beliefs and Practices

Significant variance in motivating students was explained by perceptions of student motivation and theoretical beliefs and practices. Regression analysis revealed that model significantly explained motivating students, F= 238.765, p=0.000, R^2 for model was 0.444 and adjusted R^2 was 0.443. Table 4.27 displays the intercept, unstandardized regression coefficient (B), and standardized regressions coefficient (β) for model.

According to the result, perceptions of student motivation and theoretical beliefs and practices contributed 44% (Adjusted R^2= .443) variance in motivating students. By applying multiple regression analysis presented above, the resultant model for motivating students can be defined as in the following equation concerned with perceptions of student motivation and theoretical beliefs and practices.

MS=27.707+0.254PSM+1.628TBP

MS = Motivating Students
PSM = Perceptions of Student Motivation
TBP = Theoretical Beliefs and Practices

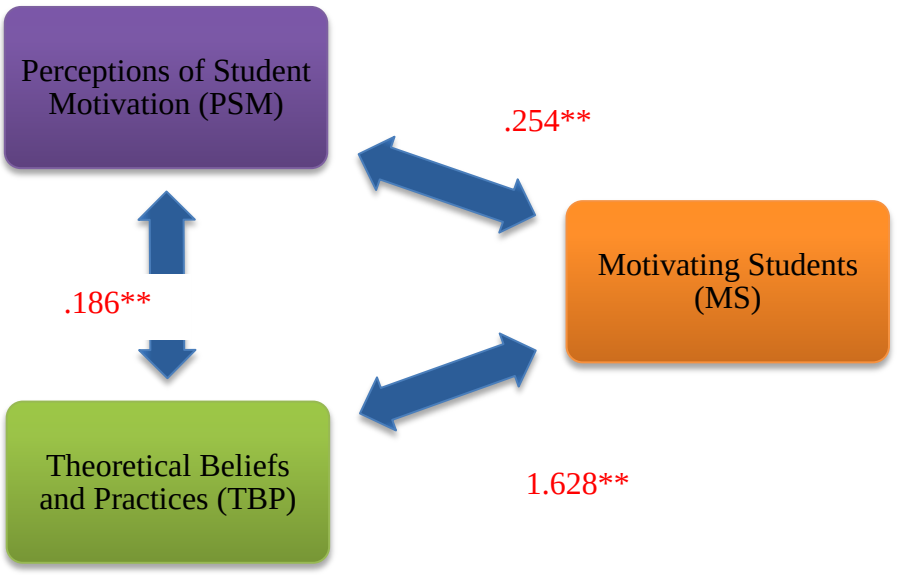

Figure: Predictor Powers of Perception of Student Motivation, Motivating Students and Theoretical Beliefs and Practices

Therefore, in this study, teachers' theoretical beliefs and practices was found the strongest predictor of motivating students and the second strongest predictor of perception of student motivation was motivating students. However, teachers' theoretical beliefs and practices were found the weakness predictor of perception of student motivation. This result is inconsistent with the research of Teresa M. D'Elisa (2015) in which there were significant predictors of the perception of student motivation and theoretical beliefs and practices. As results showed, if in-service teachers possessed perception of student motivation and theoretical beliefs and practices, they may be increased in motivating students. Therefore, it can be interpreted that if the in-service teachers have good beliefs, self-efficacy and practices of student motivation, their motivating students will heighten. Motivation is the process in which motives are related to specific goals and the satisfaction of motive is determined by achieving it. If in-service teachers faced lack of motivating students, they will motivate the students by relating their existing experiences, analyzing, beliefs, self-efficacy, using motivation strategies, consideration of the wider implication, as a result the students' motivation can be changed.

Conclusion

Motivation is the very heart of the learning process. And then motivation is a super highway to learning. The major problem of the curriculum- maker and the classroom teacher is in knowing and applying the science and art of motivation. Motivation sets the activity which results in learning or it is the art of stimulating interest in the pupil and gives the direction to learning. Teachers have different beliefs as to student motivation and its relationship to reading success. So, it has been emphasized that teachers' beliefs and student motivation. The present research was designed to study teachers' perception, beliefs and perception of student motivation.

Therefore, in-service teachers are using strategies and are looking to align their efforts with reasons they perceive are contributing to their students' lack of motivation. As teachers did not endorse an interest in professional development to learn more about student motivation, increasing teacher knowledge, efficacy, and belief in the malleability of motivation would require more creative solutions than just professional development opportunities.

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