RABSEL
the CERD Educational Journal

**Volume 16, Issue - 2
Autumn 2015**

In commemoration of the 60ᵗʰ birth anniversary of His Majesty the Fourth Druk Gyelpo

RABSEL
the CERD Educational Journal

Table of Content

***

Research - Teaching Nexus: Perceptions of the Royal University of Bhutan Faculty and Some Personal Experiences of Integrating Research into Teaching

Kezang Sherab[1] & Sonam Dorji[2]

Abstract

Research is one of the important lenses that teachers have in order to view their practice. Much research has shown that there is a positive relationship between teaching and research and research-based teaching provides the most up-to-date pedagogical practice. There is also adequate evidence that shows research active faculty benefit from teaching and learning in universities. This paper discusses the Royal University of Bhutan's (RUB) faculty perceptions of research-teaching nexus based on the survey conducted at sevenof the eight member colleges (n = 162) in 2014. While the survey findings generally indicate that there is a much higher perception of research-teaching nexus amongst its faculty there are some relative differences in their perceptions in terms of faculty from different colleges and based on their qualification. This paper also presents some personal experiences of the authors in bringing their research experiences into classroom teaching. Based on the findings from this study, several implications along with some recommendations for managing the research-teaching nexus at RUB are also presented.

Key words: Research-Teaching Nexus, Tertiary Teaching-Learning, Research Active Faculty, Research Culture, Faculty Perceptions

Introduction

The debate on research-teaching nexus in higher education was intensified especially after a meta-analysis by Hattie and Marsh (1996) concluded that research and teaching had a zero relationship. A number of other researches were carried out following this meta-analysis which led to a common consensus that research active faculty benefits teaching and learning in universities (e.g., Coate, Barnett & Williams, 2001; Healey, 2005; McLean & Barker, 2004). Today we live in a world where "our knowledge is incomplete and problems are waiting to be solved" (Leedy, Newby & Ertmer, 1997, p. 1). Albert Einstein said, "The significant

1. Senior Lecturer, Dean, Research and Industrial Linkages, PCE. E-mail: kezangsherab.pce@rub.edu.bt
2. Associate Lecturer, Paro College of Education

problems we face cannot be solved at the same level of thinking we were at when we created them." Such assertions indicate that an emphasis is needed on teaching and learning that is informed by research. For instance, Clark (1997) states that:

> From high-school diploma to the doctorate, graduates will increasingly need habits of mind necessary for informed and disciplined problem solving. For life in an inquiring society, one where information becomes knowledge and knowledge occasionally becomes wisdom, a sense of inquiry and related research enlightenment may be the best common tools that higher education can offer its graduates. (p. 253)

For the Royal University of Bhutan (RUB) where the research culture is just picking up, it is timely that such a seminar on 'research-informed teaching' is being organised. Despite numerous international researches on research-teaching nexus, there is no study conducted in the Bhutanese context to understand the perceptions of the RUB faculty. Therefore, this paper presents the findings of a survey that was initially targeted for the Paro College of Education (PCE) faculty to understand their perceptions on the research-teaching nexus and also draw on some personal experiences of the authors on how research is being integrated into teaching. However, based on the recommendations of the 6th Faculty Research Meet held at Samtse College of Education (SCE), the survey was extended to other member colleges. Building on the existing literature and also on personal experiences of how research enriches teaching and learning processes, this paper presents faculty perceptions and argues that teaching and research are complementary and should co-exist in all the higher educational institutions.

Theoretical Framework

Much research (e.g., Brew &Boud, 1995; Clark, 1997; Colbeck, 1998; Elen, Lindblom - Ylanne & Clementto, 2009) has shown that there is a positive relationship between teaching and research. Elen, Lindblom - Ylanne and Clementto (2009) argue that teaching based on research provides up-to-date information and contextualises the information. They further stress that by getting involved in research, researchers "demonstrate that knowledge is continuously evolving, continuously challenged, and changing" and that "by being actively involved, research brings knowledge to life" (p. 135). Therefore, these researchers demonstrate that there is no argument about the potential benefits of teaching and learning informed by research.

The positive influence of research on teaching has also been summarised by Coate, Barnett and Williams (2001, p. 166) in the following points:

- research-active academics are at the 'cutting-edge' of their fields, and therefore have more 'authority' to teach their subject ('students love seeing their lecturers' books on the library shelves');
- academics gain enthusiasm from being research active, which 'rubs off' on their students;
- research-active academics teach more relevant, up-to-date material;
- research-active academics teach from their immediate research experience rather than reproducing second-hand knowledge from textbooks.

Furthermore, academics need to understand that intuitive knowledge claims based on anecdotal evidence does not have the same status as knowledge claims made through a substantial body of scrupulously produced empirical data (Mnookin et. al. 2011). Brew and Boud (1995) argue that both research and teaching are learning processes and therefore the two are related.

In Bhutan, education historically was within the domain of the monasteries. It is not a discipline based on scientific research in the western sense. Even the modern education system that began in the early 1960s was based on the transmission of knowledge produced by others. All RUB colleges were teaching colleges and research was just being introduced. The new idea of pedagogy is that it is a science that can be investigated by research to discover what should be and should not be used in a classroom (Sherab & Greenwood, 2014).

Research is one of the important lenses for teachers to view their practices. Bennett and Rolheiser (2001, p. 3) point out that "teachers must be aware of and act on the science within the art of teaching." They further add that educators must become aware of other methods and incorporate them into their practice. These authors point out the need to "focus more on the critical role that specific bodies of knowledge play in assisting educators to make wise decisions concerning the design of learning environments" (p. 339). Furthermore, it is also important to understand the culture in which the learning is taking place. As Bennett and Rolheiser explain, these and other areas are just "lenses designed to extend teachers' understanding of how students learn, and from that understanding, to make decisions about how and when to select, integrate, and enact items in the … list" (p. 340). The more *lenses* or tools educators use to evaluate or develop their repertoire, the greater their *instructional intelligence* eand the better able they will be to deal with the complexities of their classroom.

Research has shown that experienced doctors use both clinical expertise and research evidence in combination. For instance, Sacket, Rosenberg, Gray, Haynes and Richardson (1996, p. 72) argue that "without clinical expertise, practice risks becoming tyrannised by evidence, for even excellent external evidence may be inapplicable to or inappropriate for an individual patient. Without current best evidence, practice risks becoming rapidly out of date, to

the detriment of patients".

Likewise, educators need to use both their teaching expertise and research evidence to make the teachinglearning process effective. What if a parent comes to a teacher and asks why did s/he teach in a particular way? Educators should be able to respond in a similar manner. That is, research says that this is the best way to teach that topic. Although there is no research carried out, there is adequate anecdotal evidence to show that most educators in Bhutan at present cannot answer this question.

Even a weaver or wood carver who has great innate ability is limited, unless they have some understanding of the "science" of the wool or wood that they use (Sherab & Greenwood, 2014). They may experiment with new ways to work with their wool or wood to discover new and better ways to develop their craft. With this additional "intelligence" they can become better weavers and carvers. Educators have the same opportunity. "Teaching effectively is an art informed by a science ... and personal experience" (Bennett &Rolheiser, 2001, p. 23).

Given the international practice of research informed teaching, it is important that the RUB faculty begin to adopt the culture of teaching and learning processes informed by research. Since many of the RUB colleges have already initiated enhancing its research culture led by the Office of the Research and External Relations, it is imperative that we first examine and understand the current faculty perceptions of the research-teaching nexus. Therefore, this paper presents survey findings related to faculty perceptions on the research-teaching nexus and also some personal experiences of the authors on how bringing research into classroom makes the teaching-learning process more enriching.

Over-arching Question

What is the RUB faculty perception of research-teaching nexus?

Sub-Questions

- What levels of perceptions do RUB faculty hold in terms of research-teaching nexus?
- Is there a significant difference in faculty perceptions of research-teaching nexus in terms of various demographic characteristics such as gender, professional qualification, tertiary teaching experience and amongst different member colleges?
- What are some of the personal experiences of the authors in terms of research informed teaching?

RUB Faculty Perceptions Survey

In order to promote and manage the research-teaching nexus at the RUB colleges, first it is important to understand the faculty perceptions on the research-

teaching relationship. With this goal in mind, a quick survey consisting of 20 items/questions was administered initially amongst faculty members of the Paro College of Education (PCE) where the authors work. Later this survey was extended to six other member colleges; (JigmeNamgyel Polytechnic (JNP); College of Natural Resources (CNR); Samtse College of Education (SCE); Sherubtse College (SC); Gedue College of Business Studies (GCBS) and College of Science and Technology (CST) based on the recommendations of the 6th Faculty Research Meet held at SCE from 16 to 18 of October 2014. The Deans of Research and Industrial Linkages were requested to administer the survey at their respective colleges. A total of 162 faculty members from 7 colleges (PCE- 48; JNP- 20; CNR- 18; SCE-18; SC- 19; GCBS- 20; and CST 19) responded to the survey (see Table 1 for the demographic characteristics of respondents).

Table 1: Demographic characteristics of respondents (n = 162)

Characteristic	Category	Respondent	%*
Gender	Male	111	68.5
	Female	46	28.4
Highest Professional Qualification	Bachelor	34	21.0
	Masters	111	68.5
	PhD	13	08.0
Tertiary Teaching Experience	Less than 10 years	77	47.5
	11-20 years	61	37.7
	Above 21 years	21	13.0

* Percentage column do not add up to 100 due to missing values

Principal Component Analysis

A Principal Component Analysis (PCA) was conducted which helped to condense a total of 20 items on the faculty perceptions of research-teaching nexus to three interpretable components. Table 2 shows the final refined component structure for faculty perceptions of research-teaching nexus. A total of six items (5, 14, 17, 18, 19, 20) that were not substantively aligned to any component were discarded. The three components accounted for a substantive 64.20% of the variance in the items. As shown in Table 2, the three components correlated moderately strongly with each other and each component demonstrated acceptable to good reliability.

Kaiser-Meyer-Olkin (KMO) measures of sampling adequacy for the faculty perceptions of research-teaching nexus scale was .88 which is greater than the minimum requirement of 0.6 and Bartlett's Test of Sphericity showed statistically

significant results (p < .05) with large chi-square values indicating suitability of items for component analysis (Manning & Munro, 2007).

Table 2: Rotated component matrix, component correlation matrix and Cronbach's alpha

	Component		
	1	2	3
(2)* Knowledge is continuously evolving (changing)	.781		
(1) Research produces knowledge	.761		
(7) Research has the potential to impact teaching	.677		
(10) Both research and teaching are learning processes	.659		
(6) University teaching must be based on a combination of both research findings and personal experience	.633		
(8) Research helps to shape curriculum	.602		
(11) Research active lecturers teach up-to-date information		.861	
(12) Research active lecturers teach relevant information		.784	
(4) As a university lecturer my sole responsibility is to teach as well as conduct research		.653	
(13) Research active lecturers can teach from their immediate research experience		.643	
(3) Knowledge claimed through empirical data are better than the knowledge claimed through one's personal experience or anecdotal evidence			.749
(15) Research helps to solve every day problems			.723
(9) Good researchers can make good teachers			.631
(16) Research helps to contextualise the information			.553

Component correlations

Component 1 Faculty perceptions of how research supports knowledge production			
Component 2 Faculty perceptions of how research active lecturers teach	.64		
Component 3 Faculty perceptions of how research helps solve every day problems	.58	.59	
Cronbach's reliability alpha	.85	.82	.74

*The number in front of each item is the original item number

Level of Faculty Perceptions

The mean for each of the three components related to faculty perceptions in terms of teaching-research nexus appears to be on a higher side based on a five-point rating scale (see table 2). The findings show that, of the three components, RUB faculty exhibits much higher perceptions that research produces knowledge while compared to the other two components– perceptions of how research active lecturers teach and perceptions of how research helps solve every day problems.

Table 2: Faculty perception components with their mean and SD

Component	Mean	Median	SD
Faculty perceptions of how research supports	4.40	4.50	.59
knowledge production Faculty perceptions of how research active lecturers teach	4.00	4.00	.76
Faculty perceptions of how research helps solve every day problems	3.50	3.50	.76

Faculty perceptions of research-teaching nexus in terms of gender, qualification tertiary teaching experience and college

A total of four one-way MANOVAs were conducted between three faculty perceptions of research-teaching nexus components: i) Faculty perceptions of how research supports knowledge production; ii) Faculty perceptions of how research active lecturers teach; and iii)Faculty perceptions of how research helps solve every day problems and four demographic characteristics (gender, qualification, tertiary teachingexperience and college) as independent variables to explore if there were any statistically significant differences in the scores of the dependent variables.

Inspection of multivariate Box's M Test showed significance ($p < .05$) for *professional qualification* and *college* indicating that observed covariance matrices of all the dependent variables were not equal across groups. However, examination of standard deviations for various groups showed that differences are minimal. Inspection of Levene's tests for each of the three dependent variables to check the homogeneity of variances revealed a few significant results. Inspection of the standard deviations for the dependent variables with significant results showed relatively small differences between the grouping categories (below .8), which suggested that violation of the assumption of homogeneity of variances had not been very serious. This finding indicated that the MANOVAs could be interpreted.

Results of Multivariate F-tests

The overall multivariate F-tests showed significant differences on two independent variables–*professionalqualification*(Wilk's' Lambda = .894, multivariate $F(6, 306) = 2.94$, p = .010, multivariate partial $\eta2$ = .055) and *college* (Wilks' Lambda = .750, multivariate $F(18, 433) = 2.57$, p = .001, multivariate partial $\eta2$ = .091). The significant multivariate F-test indicates that faculty with different professional qualification (bachelor, masters and PhD) and faculty from different colleges do differ in their perceptions of research-teaching nexus(See Figures 1, 2 & 3). Differences for other independent variables (gender and tertiary teaching experience) were non-significant.

Results of Univariate F-tests

Following significant multivariate F-tests for *professional qualification* and *college*, univariate F-tests were examined to identify which faculty perception components contributed to the significance. According to the results of univariate F-tests,*professionalqualification* showed statistically significant difference with only one component– *Faculty perceptions of how research supports knowledge production (F(2, 155) = 6.495, p = .002, partial $\eta2$ = .077).* Examination of the effect size as measured by Partial Eta Squared for the significant variable indicated that the actual variance explained in the mean values (7.7 %) between various categories was very small. Consultation of Posthoc Tukey HSD multiple comparisons tests identified significant differences in terms of *faculty perceptions of how research supports knowledge production* between faculty with bachelor and PhD (p = 001) and also between faculty with masters and PhD (p = 027). Examination of their means showed that faculty with PhD had significantly higher mean (M = 4.86; SD = .20) while compared to faculty with both bachelor (M = 4.18; SD = .71) and masters qualifications (M = 4.41; SD = .56).
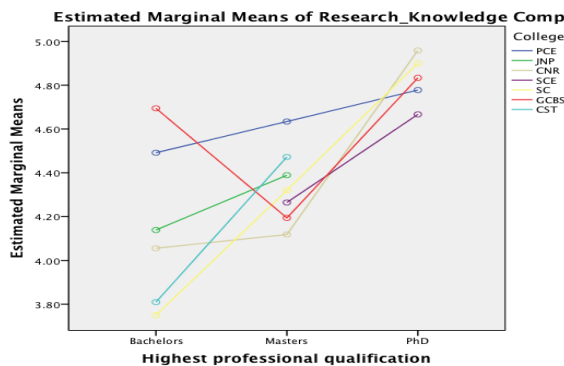
Fig. 1: Mean faculty perceptions of research produce knowledge by college & qualification
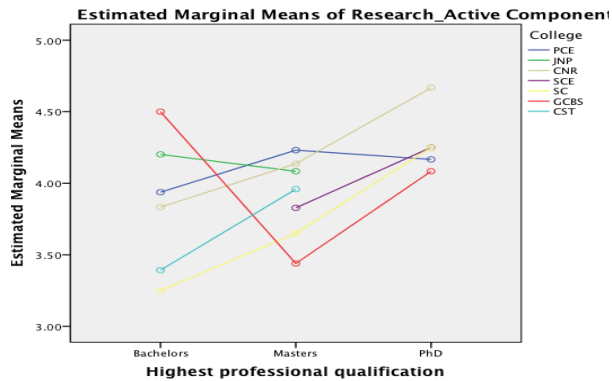
Fig. 2: Mean faculty perceptions of research active lecturers by college & qualification
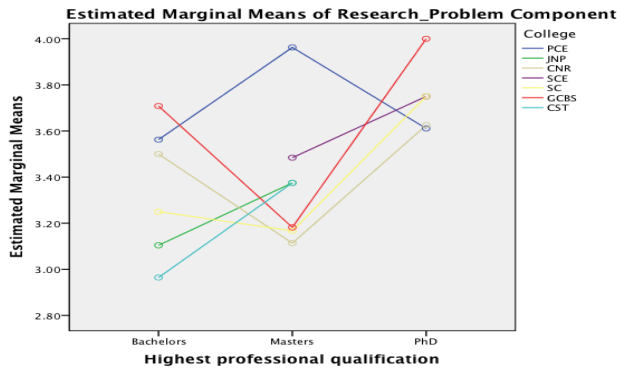
Fig. 3: Mean faculty perceptions of how research helps solve problems by college & qualification

Examination of univariate F-tests for college showed statistically marginally significant differences with two components (faculty perceptions of how research supports knowledge production *(F(6, 155) = 1.950, p = .076, partial* η2 = .070*)* and Faculty perceptions of how research active lecturers teach *(F(6, 155) = 2.149, p = .051, partial* η2 = .077*)* and significant differences in terms of faculty perceptions of how research helps solve every day problems *(F(6, 155) =4.055, p = .001, partial η2 = .136).* However, consultation of Posthoc Tukey HSD multiple comparisons tests showed significant differences for only one component– faculty perceptions of how research helps solve every day problems between PCE and JNP, PCE and CNR, PCE and SC, and PCE and CST. Examination of their means showed that PCE had significantly higher mean (M = 3.91; SD = 60) while compared to JNP (M = 3.28; SD = 87), CNR

(M = 3.29; SD = 67), SC (Mean = 3.24; SD = .73) and CST (Mean = 3.22; SD = .83). Meanwhile SCE and GCBS did not show any significant differences with any of the colleges.

Summary of the MANOVA Findings

The overall findings from this survey showed that the RUB faculty has a much higher perception about research-teaching nexus in terms of all the three faculty perceptions related components. In particular, faculty with PhD qualification seem to exhibit much higher perceptions that research helps in producing knowledge while compared to the faculty with bachelor and master's degrees. However, this could be partly attributed to a small PhD sample size (only 8% of the respondents). In terms of member colleges, the PCE showed a much higher perception that research help solve everyday problems while compared to JNP, CNR, SC and CST. Meanwhile MANOVA did not find any significant difference among colleges in terms of faculty perceptions related to how research helps in knowledge production and that research active faculty benefits the teaching-learning process.

Findings from the Open-Ended Comments

Findings from the open-ended comments indicate that faculty from the different colleges show higher perceptionsof the importance of research and that "research and teaching should go hand in hand" (Respondent 92). However, there are still some faculty members from all the colleges who lack research capacity.For instance, Respondent 1 from PCE states, "I personally feel that all the interested faculties must be provided a comprehensive research methodology training starting from how to write a proposal till the end of writing conclusion and recommendations." Open-ended comments also showed that the member colleges still need to work on reducing the teaching load of the lecturers, providing appropriate management support for research, providing equal opportunities for research between young and senior lecturers, and putting in place research mentoring processes to heighten RUB research activities.

Personal experiences of integrating research into teaching

Beginning of the 21st Century academics have witnessed the end of the debate on the research-teaching nexus. Researchers have found a common consensus that there is a positive relationship between research and teaching and vice versa. For instance, a study by Coate, Barnett and Williams, (2001) found that academics could not conduct research without teaching. Most research active academics in this study expressed that "they would not wish to work in research-only institutions" (p. 168). Therefore, RUB academics need to conduct research as well as teach for mutual benefit. As educators we must

understand that knowledge is not a fixed commodity, it keeps on changing and transforming. Research produces knowledge, helps shape curriculum and thus enriches the teaching and learning process.The following sub-sections present some personal experiences of the authors in integrating research into teaching.

First Author

Research is now increasingly used as professional development for educators instead of focussing on the 'one-shot' traditional model of professional development programme (e.g., Jaipal&Figg, 2011; Goodnough, 2011). This indicates that as an educator, we do not have to attend professional development courses if we are research active because research helps enhance our learning. There are adequate evidences (e.g., Ross, 1994; Hunzicker, 2011) to show that such 'one-shot' PD programmes are ineffective. Furthermore, action research is considered to be one of the effective models of PD for teachers as the focus is on practice by practitioners with the goal of improving practice(Kennedy, 2005; Bedford & Cooper, 2013). For instance, collaborative action research (CAR) at the Paro College of Education(see Sherab & Greenwood, 2014), participatory action research (PAR) introduced at all the RUB colleges (see Royal University of Bhutan, 2012) and transformative education for GNH project for Paro teachers– an on-going teacher as researcher project (see Bedford & Cooper, 2013) are some of the successful models of action research in Bhutan.

For instance, my action research on behavioural and cognitive engagement of pre-service student teachers has immensely helped me to design teaching strategies that promote active learning in student teachers, showing care and concern for students' learning, promoting a sense of humour and being approachable to students (see Sherab, 2013). I always implement these strategies in my teaching and during other interactions beyond the classroom to enhance student engagement in the learning process. I have realised that research is a powerful form of PD.

As a tutor for both postgraduate and undergraduate programmes, I have experienced that bringing research experiences into my classroom discussions help in making the lessons informative and relevant. For instance, having carried out a phenomenological study for my master's programme helps me to clearly explain the concept of phenomenological design in qualitative research for my postgraduate students. Likewise, I have carried out numerous interviews for my research works, which helps me to explain some of the advantages and difficulties of conducting interviews. Once I was with a group of students administering a survey questionnaire for the Anti-Corruption Commission in Punakha Dzongkhag. With much difficulty, we got hold of some Layaps who had come to Punakha for their regular shopping trips. In the middle of the interview, one of the Layap respondents left to chase away his horses from

somebody's vegetable garden. On another occasion, I was offering a workshop on research methodology to some of the faculty members from the RUB colleges at the Gadue College of Business Studies. After a theory session on types of qualitative interviews, we sent all the participants for interview practice session. One participant got hold of a man in the town and started interviewing him about his life. In the middle of the interview, the respondent got emotional and burst out into tears. The interviewer had to console the man by offering him a glass of whiskey at a nearby bar. As a researcher, what do we do under such circumstances? It is important that researchers have to plan well and be prepared for such unforeseen circumstances. Sharing such experiences help contextualise the discussion in the class rather than teaching content from only textbooks and other reference materials.

My recent research on GNH Education has further assisted me to enrich my teaching. One of the important findings of this research showed that hidden curriculum in the form of teacher behaviour in the classroom and their attitude towards students play an important role in promoting GNH values and prin-ciples in students, which most of the teacher participants were not aware of. For instance, a teacher participant in this research asked one of the students to read aloud from the textbook. This particular student had difficulty in reading the text. The teacher scolded this student saying, "*You don't even know how to read!*" In another school a child wanted to go to the toilet while the teacher was teaching but the teacher refused to send the child to the toilet. So where is GNH in such teacher behaviour? It is more likely that these students will pick up such teacher behaviour and attitude later in their life.

In this same research, one of the teacher participants perceived that one of the purposes of GNH Education in the Bhutanese education system was to "incorporate sympathy and empathy" in students but observation of his actual behaviour and attitude in the class indicated he did not model these attributes. The use of language in the classroom by the teacher was largely contrary to the philosophy of GNH Education. The teacher frequently used impolite language and in rude tones such as "Tashi stand up", "keep quiet", "sit down", and "do not make noise", which were all abrupt commands apparently lacking in kind-ness and courtesy. Such negative role modelling happened in this teacher's classroom even while he was being observed while teaching. In such situations, the students can easily absorb such impolite behaviours. This approach clearly indicates a lack of understanding of the GNH philosophy by this teacher or at least its practical implications for the classroom. Discussing the significance of teacher role model for their students, Yero (2010, p. 14), in pointing to the importance of the hidden curriculum, states that, "even more than what they 'plan' to teach, their personal values and behaviours are part of the 'taught' cur-riculum". Teachers cannot expect students to be kind and courteous when they

themselves lack kindness and courtesy in day-to-day interaction with students. Having realised the importance of teacher behaviour and attitude, I have started to be mindful of my own behaviour and attitude in my classroom seeing that it may have a negative impact on the students. Such teacher behaviour and attitude in the long term may lead to undesirable circumstances, as teachers have to deal with hundreds of students on a daily basis.

Bringing my own research findings into the classroom and sharing first hand experiences with students help make the teaching-learning process more meaningful and productive. I have derived much satisfaction in teaching based on my own research findings rather than from books and other sources. It is indeed a pride on my part to bring research experiences into classroom discussions to make research related concepts clearer to my students.

Second Author

My works on ethnographic study about *Lotokuchu community* and a study *on support system (SLS) for in-service students* have some connections to history and social studies modules that I taught. Bringing my research experiences into the classroom was confusing and challenging but fruitful.

My students' feedback indicated that incorporating research findings into social studies content had confused them more than clarify the course content knowledge. I integrated the social organization of *Lotokuchu*community (my research findings) into the social studies content on diversity of culture with the hope of providing real life experiences to my history students. Students saw the negative effects of research-led-teaching, such as unnecessarily skewing the focus of social studies content. Onestudent states, "*It is very good to know about the complex social settings and organization of Lotokuchu from the tutor but my interest to study such things diminishes when we find it is not relevant to the course content*". I have also observed that students become less confident when I relatedmy research findings – they shy-away with a nod 'it is not easy to advance knowledge'. Upon reflection, I realized that the integration of research into classroom teaching may be beneficial only if the research work is related to the course content and that it does not completely divert from it (Prince, Felder & Brent, 2007).

On another occasion, I introduced teaching of social studies and history courses through problem-based project and inquiry-based assignments. While teaching social studies on a topic– 'environment education and culture', I designed a number of problems related to environmental issues and made students embark on an inquiry-based project. Similarly, in the history course, capstone projects such as writing local and family history allow exploration using historical research skills. The students were first presented with a challenge – 'How do you think the particular festival in your village contributes to shape the

unique identity of your society?' I could capitalize my experience of *Lotokuchu* community study, especially the skill of drawing hypothesis, identifying tools for data collection and testing validity of hypothesis to explore their inner social customs. Taking this method used in these scholarly activities and translating them into such inductive teaching environment was fruitful from the students' perspectives. Students' tasks were designed based on the knowledge I have on the relevant literatures, familiarity of current information finding methods, and foreseeable challenges to guide students to acquire new knowledge. I think, this is one way of supporting the research-teaching nexus at the tertiary level.

Implications for managing the research-teaching nexus at RUB

There are a number of implications in order to strive for a balance between teaching and research at the RUB colleges. First, findings from this study indicate that there are faculty members who do not have the basics of research knowledge and skills and also have a relatively lower perception on the research-teaching nexus. Without much effort given to faculty capacity building on research knowledge and skills and enhancing the research culture, striking a balance between research and teaching would be a challenge. Currently a majority of the RUB faculty (89.5% of the survey respondents) have a bachelor and masters qualification. Therefore, member colleges need to put in extra effort to increase the perceptions of facultyin that– i) knowledge is continuously evolving (changing); ii) research produces knowledge; iii) university teaching must be based on a combination of both research findings and personal experience; iv) research has the potential to impact teaching; v) research helps to shape curriculum; and vi) both research and teaching are learning processes. Without a significant increase in the faculty perceptions related to the above areas, efforts to enhance the research-teaching nexus at the RUB would be futile.

Furthermore, member colleges like JNP, CNR, SC and CST need to improve faculty perceptions in that– i) research helps to solve every day problems; ii) knowledge claimed through empirical data are better than the knowledge claimed through one's personal experience or anecdotal evidence; iii) good researchers can make good teachers; and iv) research helps to contextualise the informa-tion.Over all, member colleges need to provide consistent focus on enhancing research culture through initiation of– i) research training programmes;ii) mentoring for beginning researchers; iii)reduction of teaching load; iv)improved management support;and v) provision of equal opportunities to both young and senior faculty members.

Second, shifting from the culture of teaching to the culture of research and teaching would be difficult for many faculty and the colleges. This has implications on time and resources. Faculty will have to devote more time, energy and commitment, which could lead to stress, burn out and impact even family

life. Research has shown that research active academics spend less time with students (Coate, et al. p. 169) and also with family because they are busy with their own research.Such negative impact is likely to affect personal happiness of those engaged in research, hence overall implications on GNH. RUB colleges and faculty members in particular have to be proactive in avoiding such negative impact of research on teaching.

Third, research centres need to play an important role in promoting research culture. Appropriate strategies must be implemented to bring about positive impact on efforts to enhance synergies between research and teaching. For instance, if too much focus is being provided to the centres to conduct research, there is a possibility to actually compartmentalize the two (Coate, et al. p. 169). Therefore, the RUB research centres need to function as facilitators of research to the faculty rather than focusing too much on the actual conduct of research. Research centres must take up an active role in promoting research by organising research related programmes such as seminar series, collaborative action research, and research training workshops.

Fourth, without appropriate policy to monitor and identify how research impacts upon teaching and supports the curriculum, faculty members are not likely to be motivated to strengthen the research-teaching relationship. Also the RUB must continue providing avenues for the faculty to showcase their work on research informed teaching. Considering all these implications would go a long way in striking a balance between research and teaching.

References

Bedford, T & Cooper, R. (2013). *Transformative education for GNH: A teacher action research project*. Bhutan.

Bennett, B. & Rolheiser, C. (2001). *Beyond monet the artful science of instructional integration.* Toronto: Bookation Inc.

Brew, A. &Boud, D. (1995). Teaching and research: Establishing the vital link with learning. *Higher Education*, *29(3), pp. 261-273*.Retrieved from http://www.jstor.org/stable/3447715, dt. 05/10/2014. .

Clark, B. R. (1997). The modern integration of research activities with teaching and learning. *The Journal of Higher Education,68(3), 241-255*. Retrieved 18/12/10 fromhttp://www.jstor.org/stable/2960040

Coate, K., Barnett, R., & Williams, G. (2001). Relationship between teaching and research in higher education in England. *Higher Education Quarterly*, *55(2), 158-174*. Retrieved 18/12/10 from http://onlinelibrary.wiley.com.ezproxy.une.edu.au/doi/10.1111/14682273.00180/pdf

Colbeck, C. L. (1998). Merging in a seamless blend: How faculty integrate teaching and research. *The Journal of Higher Education,69(6), 647-671*.

Retrieved 18/12/10 from http://www.jstor.org/stable/2649212.

Elen, J, Lindblom-Ylänne, S. & Clement, M. (2007). Faculty development in research-intensive universities: The role of academics' conceptions on the relationship between research and teaching. *International Journal for Academic Development, 12(2), 123–139.* Retrieved fromhttp://www. informaworld.com/smpp/title~content=t713685557

Hattie, J. & Marsh, H. W. (1996). The relationship between research and teaching: A meta analysis. *Review of Educational Research*, *66(4), 507-542.*

Healey, M. (2005). Linking research and teaching to benefit student learning. *Journal of Geography in Higher Education*, *29(2), 183-201.*

Hunzicker, J. (2011). Effective professional development for teachers: A checklist. *Professional Development in Education, 37(2), 177-179.*

Jaipal, K. &Figg, C. (2011). Collaborative action research approaches promoting professional development for elementary school teachers. *Educational Action Research*, *19(1), 59-72.*

Kennedy, A. (2005). Models of continuing professional development: A framework for analysis. *Journal of In-service Education, 31(2), 235-250.*

Leedy, P. D., Newby, T. J &Ertmer, P. A. (1997).*What is research?* Prentice Hall.

Manning, M., & Munro, D. (2007). *The survey researcher's SPSS cookbook.* Frenchs Forest NSW: Pearson Education Australia.

Marginson, S. & Considine, M. (2000). *The enterprise university: Power, governance and reinvention in Australia.* Melbourne: Cambridge University Press.

Mnookin, J. L., Cole, S.A., Dror, I.E., Fisher, B. A. J., Houck, M., Inman, K., … Stoney, D.A. (2011). *The need for a research culture in the forensic sciences.*Penn State, Dickenson School of Law.

Neuman, R. (1996). The teaching-research nexus: Applying a framework to university students' learning experiences. *European Journal of Education*, *29(3), 323-338.*

Mclean, M. & Barker, H. (2004). Students making progress and the 'research-teaching nexus' debate.*Teaching in Higher Education, 9(4), 407-419.*(19

Prince, M. J, Felder, R. M& Brent, R. (2007).Does faculty research improve undergraduate teaching? An analysis of existing and potential synergies. *Journal of Engineering Education*, *95(4), 283-294.*

Ross, J. A. (1994). The impact of an inservice to promote cooperative learning on the stability of teacher efficacy. *Teaching and Teacher Education, 10*(4).

Royal University of Bhutan (2012). *A participatory action research study to develop GNH Pedagogy, MA and PhD degree programs in holistic education, baseline round report.* RUB.

Sacket, D. L, Rosenberg, W. M. C, Gray J. A. M, Haynes, R. B& Richardson W. S. (1996). Evidence based medicine: What it is and what it isn't:*British*

Medical Journal, 312(7023), 71-72.

Sherab. K. (2013). Strategies for encouraging behavioural and cognitive engagement of pre-service student-teachers in Bhutan: An action research case study. *Educational Action Research*, 21(2), 164-184.

Sherab, K & Greenwood, R. (2014). Developing and nourishing a research culture at Paro College of Education. *RABSEL, the CERD Educational Journal, 15, 24-40.*

Yero, J. L. (2010). *Teaching in mind: How teacher thinking shapes education.* USA: MindFlight Publishing.

Teaching Social Skills to Children with Autism Spectrum Disorder (ASD): A Case Study of Selected Mainstream Primary Schools in the Borough of London, UK

Rinchen Dorji[1]

Abstract

The study aimed to explore how mainstream primary school teachers taught social skills to children with autism spectrum disorder. This study was a case study and data were gathered using semi-structured interviews, classroom observations, and document analysis. Picture Exchange Communication System (PECS), Treatment and Education of Autistic and related Communication handicapped Children(TEACCH), and visual timetables were some of the most commonly followed teaching strategies used by teachers in the mainstream primary schools for teaching social skills to children with autism. Social stories, social speaking, life skills programmes, play method, talking partners, buddy systems, inclusion clubs, and circle time were some other strategies used by teachers. Teachers teaching children with autism in special education classes were found to be more knowledgeable than teachers who taught children with autism in the mainstream classroom. A network of support facilities such as language and speech therapist, positive attitudes of other mainstream teachers, students, parents and opportunities for professional development teaching were considered helpful to the teachers. Budgetary support for SEN activities in school, leadership support of resource base managers and Special Educational Needs Coordinator (SENCO)were also found useful. Behavioural problems related to autistic behaviours, shortage of time, and resource constraints were seen as some of challenges.

Key words: autism spectrum disorder, disability, inclusive education

Background to the study

Autism spectrum disorder (ASD) is a complex developmental disability that typically affects the social interaction and communication skills of people. People with autism normally show difficulties in verbal and non-verbal communication, social interactions, and leisure or play activities. Autism is a puzzling developmental disorder that significantly affects a person's ability to

---

1. PhD Candidate, University of New England, Australia

communicate, interact with others, and learn in a conventional manner (Autism Society of America, 2006). To some, autism is perhaps the most mystifying mental-illness 'entities' ever identified, where it is described as an affective disorder, a developmental disorder, a neuro-cognitive disability, or a combination of these (Colombino, 2004).

Gymraeg (2007) defined autism as a lifelong developmental disability. It is part of the autism spectrum and is sometimes referred to as an autistic spectrum disorder, or an ASD. The word 'spectrum' is used because, people with autism differ widely from one another in the intensity and extent of the disabilities they suffer from. *The Diagnostic and Statistical Manual of Mental Disorders, IV-TR*(American Psychiatric Association, 2000) describe autism as a severe and pervasive impairment in the areas of reciprocal social interactions, communication skills, or the presence of stereotyped behaviour, interests, and activities.

Valente (2004) explained that children with autism fail to recognize the emotional and contextual meaning of facial expressions, gestures, and nonverbal aspects of emotions and often do not engage in eye contact or pointing at an object in their conversations. In addition, typical behaviours associated to children with autism are behaviours such as 'echolalia' – vocal perseverations or repetitive vocalizations of speech or sounds they hear, lack of reciprocity and perspective taking, and lack of skills in initiating, and terminating or repairing a conversation (Foxx, Schreck, Garito, Smith, & Weisenberger, 2004). Children with autism might also display violent and aggressive behaviours, posing risk of injury to self and others around them.

Gymraeg (2007) called the three key distinctive characteristics of autism: (a) difficulty with social communication; (b) difficulty with social interaction; and (c) difficulty with social imagination as the "triad of impairments" in autism. The social deficits or the 'social impairments'– the inability to understand and respond appropriately to the subtleties inherent in varying social situations result in multiple barriers for children with autism in participating effectively in many different social settings including learning in school (Aarons & Gittens, 2004). Although these deficits can potentially affect children with autism in their social interactions, it does not necessarily mean complete lack of sociability. They do possess the ability to build these abilities and improve upon their social life (Hewitt, 2005).

Autism as a developmental disorder is a fascinating and an intriguing phenomenon to some. Hunnisett (2004) for instance maintained that autism as a disorder is enigmatic and there are two commonly held but conflicting views about autism. One view is that everybody with "autism has some wonderful, exotic talent that shines through their strangeness" (Hunnisett, 2004, p. 15), which makes people marvel and wonder in amazement. On the other extreme

of autism is the more populist understanding where autism is seen as a disability that completely isolates the individual from the regular world. The desire to break these social barriers is strong but the corresponding frustrations of the failure to break these walls of social imprisonment leaves these individuals with feelings of despondency and hopelessness. Sadly enough, the second extreme of these two views is the way that people mostly understand autism.

Leo Kanner, who is credited to have first talked about this disorder once attributed the cause of autism to parents, especially the mother, for inadequacy of affection and warmth for the child, often referred to as "refrigerator mother" and "cold intellectual parents"(Aarons & Gittens, 2004). This belief and perspective of associating autism to parental culpability is debatable. Recent studies show that autism is more associated with neuropsychological disorder as a frontal lobe disturbance (Ozonoff, Pennington, & Rogers, 1991) with a significant genetic component (Bailey, Phillips, & Rutter, 1996; Rutter, Bailey, Bolton, & Le Couteur, 1993).

In Bhutan, many people do not know much about autism. The harm that this ignorance does to their education and social life is further aggravated by the Buddhist belief in "karma" – the moral law of causation, which forms the fundamental doctrine in Buddhism (Sayadaw, 2008). In a typical Bhutanese family, if a child were born with autism or any other disability, the family would make a few initial attempts to seek medical support and then give up accepting the disorder in the child as a result of karma. In most cases, a child with autism or other disabilities in Bhutan would remain homebound for life because of the lack of support services exacerbated by the religious belief of karma which makes the life of individuals with disabilities more vulnerable to being marginalized and isolated from mainstream society.

The move towards inclusive education where children with special needs are educated in mainstream school has become an important educational discourse in many education systems around the world (Moore et al., 1999; Stainback, Stainback, East, & Sapon-Shevin, 1994). Despite the manifold progress of including children with disabilities in the mainstream education, the achievements made hitherto, are still contested and challenged bitterly. The United Nations (2007) reported that while the international human rights framework has changed lives everywhere, persons with disabilities have not reaped the same benefits and still represent the world's largest and most disadvantaged minority.

The state of individuals with autism is not so different from other disabilities. They still remain highly vulnerable and subsequently excluded from the mainstream society (Barnes, 2002). Due to a variety of factors, children with autism face difficulty in communication and social adjustments making effective inclusion of this group of children into the mainstream classroom more daunting

and problematic. One of the primary concerns regarding the education or learning of children with autism in mainstream education is the presence of the "triads of impairments" namely communication, socialization and imagination. The triads of impairments can be so debilitating for children with autism that they may become vulnerable, and suffer a serious disadvantage in their learning and development (Gymraeg, 2007; Hewitt, 2005). It can compound and magnify the difficulty of the learning task and could prevent children with autism to blend in with the others in the class and consequently remain excluded from most of the class activities. Given these specific challenges, there is a need to investigate and explore the facilitation of social integration of children with autism in an inclusive educational setting (Harrower & Dunlap, 2001).

Thus, this research study has been an attempt to investigate how mainstream primary school teachers teach social skills to children with autism. The primary purpose of this study was to examine the teaching strategies adopted by teachers in the mainstream primary school to teach social skills to children with autism. It also aimed at getting a deeper insight into the practical realities of classroom teaching practices and the challenges of teaching children with autism in the mainstream schools. The study was thus guided by the following research question: *How do the teachers teach social skills to children with autism spectrum disorder in mainstream primary schools?*

Literature Review

Meaning of autism

As presented in the preceding section, autism is a disorder that affects an individual's social abilities. It inhibits a person's ability to socialize because of an inability to understand other people's emotions, lack of reciprocity (conversation skills), poor social imagination, and the use of socially discouraging behaviours, which are mostly disruptive and destructive in nature. Since autism by itself is a very complex and a puzzling disorder, where the characteristic symptoms shown by children with this disorder range from very high functioning to profoundly impaired, it is very difficult to describe autism comprehensively.

For an in-depth understanding of autism as a developmental disorder, some of the key characteristic features normally displayed by children with autism are discussed.

What causes autism?

Leo Kanner, who is credited to have first talked about this disorder once attributed the cause of autism to parents, especially the mother, for inadequacy of affection and warmth for the child, often referred to as "refrigerator mother" or "cold intellectual parents"(Aarons & Gittens, 1999). This belief and perspective

of looking at autism as a problem associated to parental culpability is called as the psychogenic or psychodynamic theory implying the role of social environment in autism (Perko & McLaughlin, 2002). The claims that autism is a result of inadequate parenting is challenged by recent studies that associated autism to neuropsychological disorder as a frontal lobe disturbance with a significant genetic component (Bailey et al., 1996; Perko & McLaughlin, 2002). The association of autistic spectrum disorder with neuropsychological disorder does appear more convincing in explaining autism as a disorder.

Characteristics of autism

Children with autism spectrum disorder have the difficulty of using the nonverbal social communications typical of young children (Valente, 2004). They fail to recognise the emotional and contextual meaning of facial expressions, gestures, and nonverbal aspects of emotions. Children with autism often do not engage in eye contact or pointing at an object in their conversations. Tanguay (2000) explained that children with autism would rather communicate with people through crying or sometimes even screaming out at a person. Such deficits in basic social and communication skills could pose acute challenges in socializing and interacting effectively in school, adversely affecting their overall academic achievements. The findings of this particular study in some ways is expected to reveal how the teachers in school address this issue in maximizing the interaction of children with autistic spectrum disorder despite their inherent challenges in social and communication skills.

In addition to the characteristic features of autism already discussed, typical behaviours associated to children with autism are behaviours such as *'echolalia'* – vocal perseverations or repetitive vocalizations of speech or sounds they hear, lack of reciprocity and perspective taking, lack of skills in initiating, terminating or repairing a conversation, difficulty in coordinating gross and fine motor movement, locating their bodies and space, and difficulty in regulating the level of sensory input and in joint attention (Perko & McLaughlin, 2002). Children with autism might very often also display violent and aggressive behaviours, which can sometimes be self-injurious and also dangerous to others around them.

Three distinctive characteristics are key when discussing autism spectrum disorder. They are (a) difficulty with social communication; (b) difficulty with social interaction; and (c) difficulty with social imagination. Gymraeg (2007) described these distinctive characteristics of autism as the *"triad of impairments"* in autism. It is evident that most of the challenges that impede the normal development of a child with autism accrue from their language and communication deficits. The social deficits or the 'social impairments' – the inability to understand and respond appropriately to the subtleties inherent in varying social situations result in multiple barriers for children with autism

(Aarons & Gittens, 2004). These social deficits deprive them from participating effectively in many different social settings such as schools that demand good social and communication skills for academic achievement.

Strategies for Teaching Children with Autism

There are a number of teaching strategies teachers use to teach children with autism. Some of the commonly followed teaching strategies such asTreatment and Education of Autistic and Communication Handicapped Children (TEACCH), Picture Exchange Communication System (PECS), naturalistic teaching, social stories and peer tutoring, giggle-game, audio-visual aids such as television and video prompts, and Applied Behaviour Analysis (ABA) are discussed in this section.

Treatment and Education of Autistic and Communication Handicapped Children (TEACCH)

TEACCH is a programme that is built on the premise of adapting the environment to address the needs of an individual child. Tissot and Evans (2003) and Tutt, Powell, and Thornton (2006) explained that TEACCH as an educational programme provides a clear structure and organisation to assist a child with autism to perform and complete specific tasks through the use of pictorial schedules or visual cues that visually represent events in a child's day or steps necessary to complete a task. TEACCH is widely used in schools in the UK and United States (Jordan & Jones, 1999; Tissot & Evans, 2003). Aarons and Gittens (1999) argued that TEACCH has achieved desirable and satisfying results in many different settings. TEACCH is an appropriate teaching strategy for teaching social and communication skills especially to children with autism because it includes both language and behaviour-focused programmes, designed to address the needs of an individual child. TEACCH has been so successful that the National Autistic Society in UKhas endorsed it to be used by professionals in the field of autistic disorders (Aarons & Gittens, 1999; Jordan & Jones, 1999).

Picture Exchange Communication System (PECS)

Andrew Bondy and Lori Frost are attributed for initially designing PECS in the United States. PECS has gained popularity as a strategy for teaching children on the autistic continuum (Tissot & Evans, 2003). PECS is a communication system where children with autism are taught spontaneous communication skills through the use of cards that have symbols and pictures to represent the items or objects. A typical situation of using PECS would involve a child with autism taking a card to his or her communication partner or a teacher to express the child's need for that object. Once the child masters the skill of accessing the desired items, this system of communication is used to teach concepts or other

abstract ideas (Bondy & Frost, 1998 as cited in Tissot & Evans, 2003). Ganz and Simpson (2004) reported that children with autism not only developed spontaneous communication and speech but also demonstrated a reduction in their autistic behaviour after the use of PECS. A similar positive impact of the use of PECS has been noted in the schools in the UK ever since PECS was formally established in 1998 (Magiati & Howlin, 2003).

Naturalistic teaching

Naturalistic teaching is a highly stimulating child-centered teaching approach that creates a variety of play and interactional activities between the teacher and the child with autism. This approach of teaching is tailored specifically to meet the unique needs of children with autism (Harrower & Dunlap, 2001). Kohler, Anthony, Steighner, and Hoyson (2001) explained that naturalistic teaching encourages the child to be more proactive in initiating social interactions in contrast to the conventional practices where children passively respond to adult prompts and directions.

Social stories and peer tutoring

Social stories or social scripts, peer mediated strategies involving peer tutoring and peer modelling, cooperative learning groups, class wide interventions in inclusive settings, pivotal skills, and initiation by children with autism themselves have also been used effectively to teach social skills to children with autism(Weiss & Harris, 2001). Especially, peer mediated strategies that involve peer tutoring and peer modelling through the use of buddy systems can be quite effective as it creates an inclusive setting where children with autism get to learn and develop their social skills by interacting with different peers at different times. Further, Belchic and Harris (1994) also supported the use of initiation skills by children with autism when interacting with peers in the classroom because the skills learnt in the classroom transferred across settings and individuals such as the playground and to siblings at home.

Giggle-game

One strategy or a programme that appears very interesting in helping children with autism develop their social skills is the giggle game (Sonders, 2002). Giggle game not only teaches turn taking skills but also establishes a basis for pre-conversational speech in children with autism. The game by itself is a mini-conversation, with each partner taking a communicative turn and waiting for the turn of the other. In addition to this, giggle game also teaches a variety of other social and communicative skills such as "joint attention, staying in close proximity, enjoying each other's company and social reciprocity"

(Sonders, 2002, p. 18). These skills are fundamental social skills needed to adapt successfully in the social environment.

Use of television and video prompts

The use of television and video prompts are very friendly and non-threatening ways of helping children with autism to acquire acceptable forms of social skills. Hewitt (2005) suggested that this practice could be extended to videoing those pupils in need of specific behavioural support to watch and analyse their own behaviours. However, to be able to detect a problem in their behaviour and accordingly analyse them, children need to possess a relatively higher levels of cognitive capacity, which might prove very difficult for children with autism.

Applied Behaviour Analysis (ABA)

Among the current techniques used for behavioural improvement of children with autism, which includes social and communication skills, Applied Behaviour Analysis (ABA), is the most supported by research (Kirk, Gallaghar, & Anastasiow, 2000). Many other strategies discussed in this review of literature follow the principle of applied behaviour analysis, i.e. 'ABC' (*antecedent* behaviour; the *behaviour* itself; and the *consequence*). Environment plays a very critical role in the application of ABA in teaching. This is supported by Potter and Whittaker (2001) and Welton, Vakil, and Carasea (2004) who maintained that the nature of the communication environments is crucial because the success of children's learning of social and communication skills may possibly depend on the environment which can either be enabling or disabling.

When discussing the strategies and approaches to help children with autism learn social and communication skills, care should be taken to create a communication environment that is enabling, one that facilitates and empowers the children to initiate spontaneous communication. It is also essential to note that the success of one strategy with one group of children with autism does not necessarily guarantee success with other children because autism is a spectrum disorder, where children differ greatly in terms of the severity of their disorder and subsequently, their needs. Teachers and professionals need to understand that there is no *'cookbook'* approach to working with children with autism (Welton et al., 2004), which makes it challenging for parents and educators to teach social skills to children with autism spectrum disorder.

Research Method

Case study

This study aimed to develop an in-depth understanding of how teachers taught social skills to children with autism in a mainstream school. Case

study was chosen as the research method because it is particularly useful for responding to *how* and *why* questions about a contemporary set of events (Baker, 2000). Moreover, Silverman (2005) had suggested that case study provides the opportunity of producing a thorough, analytically interesting research study to deepen the understanding of the phenomenon investigated.

Research site and participants

This study was conducted in three selected mainstream primary schools in the borough of London, UK. Two schools had special education units attached to the school and the third did not have a special education unit but had children with autistic spectrum disorder. Eight professionals comprising of one inclusive education manager, two in-charges of a special education unit attached to school, two special education teachers and three mainstream school teachers participated in the study. The selection of research participants and study sites were largely determined by the availability of teachers willing to participate and the availability of schools. The involvement of professionals with different roles in the three schools provided information from different sources and perspectives, which were useful in maintaining the validity and reliability of the study.

Data collection

Semi-structured interviews of about 30-45 minutes with each participant were conducted to get an in-depth understanding of how teachers taught social skills to children with autism. Leonard-Barton (1990) suggested interviews as possibly the best approach for collecting data if the objective of the research is largely exploratory involving description and eliciting a range and depth of information about a phenomenon or a case.

Classroom observation was another data collection used in this study. The observations were specifically focused on the frequency of two-way interaction between the child with autism with the teacher and with other regular children in the classroom. Document analysis of Special Educational Needs Policy of each school and Individualized Education Plan (IEPs) planned for students with autism were used as part of data collection. Document analysis was useful as it provided an unobtrusive way of collecting data and the information thus obtained proved useful for the study to substantiate and triangulate the data gathered from other sources.

Ethical issues

The Revised Ethical Guidelines for Educational Research (British Educational Research Association (BERA), 2004) adopted by the University of Roehampton was followed to ensure that the study does not breach any of the

research ethics. A letter was sent to the schools to get an informed consent of the participants. Pseudonyms were used to maintain the participants' anonymity and the identity of the schools. No other people had access to the research documents.

Findings and Discussion

The study revealed that the teachers in school used a wide range of highly interactive teaching strategies to teach social skills to children with ASD. The teachers teaching children with ASD in a special education unit were more knowledgeable and better informed than those who taught children with autism in the mainstream classroom. Some of the key teaching strategies used by teachers in mainstream primary classrooms to teach social skills to children with autism are discussed in the following section.

Picture Exchange Communication System (PECS)

PECS was one of the teaching strategies that emerged prominently compared to other strategies. The teachers who used PECS in their teaching stated that PECS make learning easy and help children pick up language and communication skills in a very interactive process through the use of visuals and talking. One of the Resource Base Coordinators of a Special Education Unit in a school said:

> *All of our teachers are PECS trained teachers except Cindy (name changed), who has joined us recently. ...It is a very structured way of teaching social and communication skills based on applied behaviour analysis (ABA) approach.*

Another teacher reiterated the same opinion as follows:

> *PECS is very important and some teaching assistants have training on PECS and that's a bonus for them and we strive to train all our teachers on PECS.*

Teachers from other schools also supported the use of PECS in their teaching and shared the benefits of using PECS as follows:

> *PECS is very good and children respond very well when we use these strategies or approaches. The fact that PECS is based on visual cues works very well with the type of children we have in the base.*

The fact that PECS involves using a lot of visual, interactive teaching and learning processes that constantly constantly engaged children in some forms

of social interactions appeared to be the reasons for seeing PECS as an effective strategy for teaching children with autism.

This finding is supported by the British Educational Research Association (BERA, 2004), who observed a significant improvement in children's communication skills after the use of PECS by teachers in schools across the UK. A number of other studies also noted the same positive impact of PECS in the UK ever since its formal introduction across school in 1998 (Magiati & Howlin, 2003).

This study also found the popularity of PECS among teachers teaching children with autism in the SEN setting than those teachers who taught children in mainstream classroom. The extensive use of PECS for teaching was clearly evident in the classroom displays and the record of Individualised Education Plans (IEPs) teachers had documented for each child. Conversely, the teachers in the mainstream school hardly mentioned using PECS in their teaching. Neither was this seen during the classroom observation of mainstream classroom teaching where children with autism sometimes attended.

Teaching and Education of Autistic and related Communication Handicapped Children (TEACCH)

TEACCH was another teaching strategy that appeared commonly followed by teachers to teach children with autism. Like PECS, most teachers in this study found TEACCH very effective in teaching children with ASD. The participants asserted with certainty about the effectiveness of TEACCH and one teacher claimed that the *'teacher has no failure to teach well with TEACCH because the child knows exactly what to do'*. Some of the recurring reasons teachers expressed for using TEACCH for teaching social and communication skills to children with autism were the following:

- *TEACCH suits the needs of our children.*
- *It involves doing the task in small chunks that has a definite start and definite finish to the work.*
- *The child knows exactly what to do and the teacher has no failure in it.*

Another teacher added that:

- *TEACCH has activities, which are structured and arranged in order of progression that is very ideal for children with autistic spectrum disorder.*

Baker (2000), and Baker and Webb (1999) also supported the effectiveness of TEACCH saying that it is used extensively and successfully across many schools in the UK. These authors further maintained that the National Autistic

Society of UK endorsed TEACCH as a reliable and dependable strategy to be used by professionals in the field of autistic disorders considering its efficacy especially in teaching children with autism.

Almost all the teachers who participated in this study had used both PECS and TEACCH in their teaching and were evident in the IEP record they had maintained. The effectiveness of PECS and TEACCH was also observed during the classroom teaching observations where students were really engaged in an array of interactive learning activities. Interestingly, the teachers in the mainstream classrooms did not mention anything about TEACCH although they did have to teach children with autism in their classes. The reasons for this could be because the mainstream classroom teachers are heavily dependant on the teaching assistants who mostly attend to the needs of children with autism.

Visual Timetable

Visual Timetable was another teaching strategy widely used for teaching social and communication skills to children with autism in the schools under study. Especially, the teachers in the Special Education Units appeared to have used visual timetables in all their lessons and this was confirmed by one of the participants who said that the teachers in her school use visual timetables *"every day of their teaching"*. The teachers reported that the visual cues used by teachers in their teaching assists children with autism in initiating verbal communication. For instance, the Resource Base Coordinator of one of the schools stated:

> *Visual timetable is used by our teachers almost everyday in their teaching. Because a child with autism has difficulty in their speech and communication, the visual timetables serve as a catalyst in generating speech and language usage through the visual cues.*

This same claim was echoed in the statements made by two other participants. They contended:

> *Children with autism function on a very high level of systems meaning that they need systems in place to operate their mind. That's why we have the visual time-tables, which clearly show what they need to do at different stages of the lesson.*

The extent of the use of visual timetables was clearly manifested in the display of large collections of visual materials in the classroom walls. Similar to PECS and TEACCH, the evidence of the use of visual timetables was literally non-existent in the mainstream primary classrooms.

Social Stories

Social Stories was another teaching strategy that appeared to be a common practice amongst the participants of this study. The teachers believed that social stories helped the children learn social values and develop empathy. Further, the participants claimed that social stories taught children with autism social values of life, which are useful in adjusting to social situations in life. To support this claim, one participant maintained:

> *Social stories have been working very well especially in teaching the children social skills and values of respect, which are fundamental and basic in relating with others in life.*

This concurs with the claims made by Belchic and Harris (1994) about the benefits of using social stories for teaching social skills to children with autism. They argued that the initiation skills learnt by children with autism through social stories in the classroom transferred across settings to help them adapt to practical realities in life.

In addition, many other strategies such as the social speaking, play method, modeling of appropriate behaviours, life skills programmes, 'Transporters' DVD, talking partners or buddy systems, Inclusion Club and Circle Time were used for teaching social skills to children with autism in the schools under this study. Although these strategies were named differently, they looked similar in its actual application to teaching. For instance, social speaking and modeling of appropriate behaviours are both used in PECS as well as in TEACCH where the teacher first picks up a picture or a visual object and then models to the child showing "when", "what" and "how" to speak either within a group or with a partner or the teacher. The modeling of appropriate behaviours is also a key element in the practice of Applied Behaviour Analysis (ABA), which is used widely in behaviour modification programmes (Aarons & Gittens, 2004). The use of teaching strategies such as peer tutoring, giggle game and the use of TV and video prompts were not observed during the school visits for data collection. Nor did the teachers mention about the use of these strategies in their classroom teaching.

There are several other teaching strategies that can be used to teach social skills to children with autism. What teachers and educators need to understand is, there is no "cookbook" or a "recipe" which prescribes one perfect strategy that can be used in teaching social skills to children with autism (Kirk et al., 2000). It is even difficult to say which strategy is more effective than the other as one teacher participant clearly stated:

> *....it is difficult to really say that one strategy is used more often than others. Most often, we tend to use a combination of teaching strategies because the different strategies overlap with one another in its practice.*

In view of this, it is difficult to really separate the use of one teaching strategy from another strategy and argue that one is better than the other.

In general, the teachers teaching autistic children in a special education classes were more knowledgeable and better informed than those teachers who taught children with autism in the mainstream classroom. This could probably be attributed to the heavy dependence by mainstream school teachers on the learning support assistants to attend to the needs of children with special needs in the mainstream class as one teacher participant admitted that "*But to be perfectly honest, I haven't really used that many. We had a Learning Support Assistant who mostly worked with this child [autistic child] and I left for her to work with him*".

Such practice promotes exclusion in the name of inclusion. The SEN policy of all these schools vouch for the provision of inclusive education where all teachers considered themselves as teachers of SEN and worked with a belief that good special needs practice is good practice for all pupils. Such commitments often do not get translated into teaching practices in the classroom. The inclusive education practices observed in these schools were a typical example of 'integration' instead of 'inclusion' because most mainstream classroom teachers expected a child with autism to adapt to the existing teaching practices without any additional support other than the learning support assistant who devoted solely in helping the child with special needs in the classroom (Welton et al., 2004).

Lastly, these strategies though used for teaching children with autism, could also be used effectively in teaching regular students especially in the lower primary classes. In Bhutan where English as a medium of classroom instruction is a foreign language, the use of strategies such as PECS, social stories, visual timetables, buddy systems and many others discussed in this study could be used by teachers in mainstream classrooms not only to improve their instructional practices but also to make children's learning experiences more child-centred, interactive, enjoyable, exciting and meaningful.

Besides the teaching strategies used by teachers for teaching social skills to children with autism, this study also observed the availability of well-established support network for teachers teaching children with autism in schools. The support of language and speech therapist, positive attitudes of other mainstream teachers, students, parents towards children with autism and other forms of special needs and the training and professional development opportunities the school provided were considered helpful. The budgetary support for SEN

activities in school, leadership support of resource base managers and support of Special Educational Needs Coordinator (SENCO) played a paramount role in helping teachers to teach children with autism. Key policy documents and legislations such as the *1944 Education Action Act* (Batten, 2007); the *SEN Code of Practice* (DfES, 2001) and the *Special Educational Needs and Disability Act* (SENDA) (Office of the Public Sector Information, 2001) provided strong policy frameworks and guidelines for schools in the implementation of education programmes that are inclusive in practice.

Lessons Bhutanese schools can take from this study

Although this study was carried out in the UK, the findings of this study can still be useful for the Bhutanese education system as stated:

1. Many educators, teachers, parents and policy makers in Bhutan do not know much about autism as a development disorder. The findings of this study can be used to educate the Bhutanese people especially the teachers, parents and educators about autism as a disability and the need to acknowledge and respect their unique learning needs in school.
2. Importance of teacher education and the need to prepare all teachers to effectively teach children with autism and others forms of special needs in mainstream classrooms so that all teachers are equipped to adequately address the learning and developmental needs of all children. The practice of heavy reliance by mainstream school teachers on teaching assistants to look after the learning needs of children with special needs can be avoided by ensuring that all teachers are adequately prepared to teach diverse groups of learners. The use of teaching assistants to help children with special needs not only make these children dependent but also deprive them of interacting with other peers in the classroom thereby encouraging the vicious cycle of exclusionary instructional practices.
3. Bhutanese teachers could explore and experiment the application of teaching strategies such as PECS, TEACCH, visual timetables, social stories and other strategies in the Bhutanese classrooms because these teaching strategies need not necessarily be restricted to teaching children with autism only.
4. Importance of developing Inclusive Education Policies and Legislations that protect the rights of children with autism and other disabilities.
5. Significance of formulating policies that provide clear directions and guidance to all stakeholders in advancing inclusive education efforts in Bhutan. This need to be done through a consultative process where Bhutanese indigenous knowledge and wisdom are given due

recognition instead of solely relying on foreign experts and imported ideas.

6. Importance of the provision of a good network of support services in terms of budgetary support, resource allocation, and mobilisation of resources for advancing inclusive education initiatives.

Conclusion

Social skills deficits are hallmark characteristics of autism spectrum disorders. This research explored how children with autism are taught social skills in mainstream primary school classrooms and whether these children are fully included in the daily classroom teaching practices as advocated by inclusive education philosophy. The study revealed the use of a variety of teaching strategies for teaching social skills to children with autism in the SEN classroom by special education teachers. Unfortunately, the teachers in the mainstream classrooms hardly used teaching strategies that socially engaged the child with autism during the lesson. Instead, there were indications of a heavy reliance on the support of the teaching assistants by the mainstream teachers to attend to the needs of autistic children, which deprived children with autism from interacting with other peers in the classroom. Whilst there was a good network of support facilities that enabled the teachers to teach children with autism in a mainstream setting, the teachers showed a serious lack of knowledge and skills to teach children with autism and a range of other forms of special needs. Inclusive education is a new concept in Bhutanese schools and initiatives to include children with special needs in mainstream school are in its beginning stage. Bhutan can take this late start as an opportunity to explore and critically study the development of inclusive education reforms and practices in other countries to build an inclusive education that is grounded in Bhutanese cultural values and the principles of Gross National Happiness.

References

Aarons, M., & Gittens, T. (1999). *The handbook of autism*. London: Routledge.

Aarons, M., & Gittens, T. (2004). *The handbook of autism: A guide for parents and professionals* (2nd edition ed.). London: Routledge.

American Psychiatric Association. (2000). *Diagnostic and Statistical Manual of Mental Disorders (4th edn., DSM-IV)*. Washington DC APA.

Autism Society of America. (2006). Building our future: Educating students on the autism spectrum. Retrieved from http://www.autism-society.org.

Bailey, A., Phillips, W., & Rutter, M. (1996). Autism: Towards an integration of clinical, genetic, neuropsychological and neurobiological perspective. *Journal of Child Psychology and Psychiatry, 37*(1), 89-126.

Baker, S. (2000). Learning through pictures. *Communication*(Spring 2000), 15-17.

Baker, S., & Webb, T. (1999). *PECS: The development of the Picture Exchange Communication System in the UK: Sharing the excitement*. Paper presented at the Paper presented at the DNA Day-to-Day Living: Research and Real Life Conference, London.

Barnes, C. (2002). Introduction: Disability, policy and politics. *Policy & Politics, 30*(3), 311-318.

Batten, C. (2007). Inclusion and the autism spectrum. *Improving Schools, 8*(1), 93-96.

Belchic, J. K., & Harris, S. L. (1994). The use of multiple peer exemplars to enhance the generalization of play skills to the siblings of children with autism. *Childhood and Family Behaviour Therapy, 16*(3), 1-25.

British Educational Research Association (BERA). (2004). *Revised ethical guidelines for educational research (2004)*. Retrieved from London: http://www.bera.ac.uk/publications/pdfs/ETHICA1.PDF

Colombino, T. (2004). Theory of mind and the practical management of autistic behaviour in the classroom environment. *Theory Psychology, 14*(5), 725-737.

Foxx, R. M., Schreck, K. A., Garito, J., Smith, A., & Weisenberger, S. (2004). Replacing the echolalia of children with autism with functional use of verbal labeling. *Journal of Developmental and Physical Disabilities, 16*(4), 307-320. doi:10.1007/s10882-004-0688-5.

Ganz, J. B., & Simpson, R. L. (2004). Effects on communicative requesting and speech development of the picture exchange communication system in children with characteristics of autism. *J Autism Dev Disord, 34*(4), 395-406.

Gymraeg, C. (2007). Autism: What is it? Retrieved from http://www.nas.org.uk/nas/jsp/polopoly.jsp?d=211.

Harrower, J. K., & Dunlap, G. (2001). Including children with autism in general education classrooms: A review of effective strategies. *Behaviour*

Modification, 25(5), 762-784.

Hewitt, S. (2005). *Specialist support approaches to autism spectrum disorder students in mainstream settings*. London: Jessica Kingsley Publishers.

Hunnisett, F. (2004). *Little Class with the Big Personality: Experiences of Teachers of a Class of Young Children with Autism*. London: Jessica Kingsley Publishers.

Jordan, R., & Jones, G. (1999). Review of research into educational interventions for children with autism in the UK. *Autism, 3*(1), 101-110.

Kirk, S., Gallaghar, J., & Anastasiow, N. (2000). *Educating exceptional children* (9th ed.). Boston: Houghton Miffin Company.

Kohler, F. W., Anthony, L. J., Steighner, S. A., & Hoyson, M. (2001). Teaching social interaction skills in the integrated preschool: An examination of naturalistic tactic. *Topics in Early Childhood Special Education, 21*(2), 93-103.

Leonard-Barton, D. (1990). A dual methodology for case studies: Synergistic use of a longitudinal single site with replicated multiple site. *Organization Science, 1*(3), 248-266.

Magiati, I., & Howlin, P. (2003). A pilot evaluation study of the Picture Exchange Communication System (PECS) for children with autistic spectrum disorder. *Autism, 7*(3), 297-320.

Moore, D. W., Anderson, A., Timperley, H., Glynn, T., Macfarlane, A., Brown, D., & Thomson, C. (1999). *Caught between stories: Special education in New Zealand*. Wellington: New Zealand Council for Educational Research.

Ozonoff, S., Pennington, B. F., & Rogers, S. J. (1991). Executive function deficits in high functioning children with autism: Relationship to theory of mind. *Journal of Child Psychology and Psychiatry, 32*, 1081-1106.

Perko, S., & McLaughlin, T. F. (2002). Autism: Characteristics, causes and some educational interventions. *International Journal of Special Education, 17*(2), 60-69.

Potter, C., & Whittaker, C. (2001). *Enabling communication in children with autism*. London, UK: Jessica Kingsley Publishers.

Rutter, M., Bailey, A., Bolton, P., & Le Couteur, A. (1993). Autism: Syndrome definition and possible genetic mechanism. In R. Plomin & G. E. McClearn (Eds.), *Nature, nurture and psychology*. Washington, DC: APA Books.

Sayadaw, M. (2008). *The theory of karma*. Australia: Buddha Dharma Education Association Inc.

Sonders, A. A. (2002). *Giggle time – Establishing the social connection: A program to develop the communication skills of children with autism*. London, UK: Jessica Kingsley Publishers.

Stainback, S., Stainback, W., East, K., & Sapon-Shevin, M. (1994). A commentary on inclusion and the development of a positive self-identity by

people with disabilitie. *Exceptional Children, 60*(6), 486-490.

Tanguay, P. E. (2000). Pervasive developmental disorders: A 10-year review. *Journal of the American Academy of Child and Adolescent Psychiatry, 39*(9), 1079-1095.

Tissot, C., & Evans, R. (2003). Visual Teaching Strategies for Children with Autism. *Early Child Development and Care, 173*(4), 425-433. doi:10.108 0/0300443032000079104.

Tutt, R., Powell, S., & Thornton, M. (2006). Educational Approaches in Autism: What we know about what we do. *Educational Psychology in Practice, 22*(1), 69-81. doi:10.1080/02667360500512452.

United Nations. (2007). *From exclusion to equality: Realizing the rights of persons with disabilities – Handbook for Parliamentarians on the Convention on the Rights of Persons with disabilities and its optional protocol*. Retrieved from Geneva:

Valente, S. M. (2004). Autism. *Journal of American Psychiatric Nurses Association, 10*(5), 236-243.

Weiss, M. J., & Harris, S. L. (2001). Teaching social skills to people with autism. *Behaviour Modification, 25*(5), 785-802.

Welton, E., Vakil, S., & Carasea, C. (2004). Strategies for increasing positive social interactions in children with autism: A case study. *Teaching Exceptional Children, 37*(1), 40-46.

Bhutanese student's attitude towards mathematics:
Findings from a cross-sectional survey of grade six students

Pedup Dukpa[1]

Abstract

Studies conducted on mathematics learning in Bhutan have highlighted the underachievement of students as a big concern in this area. This paper delves deeper into the cause by keeping the grade six students at the center and ascertaining their attitude level towards mathematics learning and by checking for any significant difference based on gender and location of school. Two-stage probabilistic stratified sampling procedure was used and the required sample size of 374 students (male = 182 and female = 192) from 33 schools across the country was determined using the formula published by the research division of the NEA, US. The adapted version of the Modified Fennema-Sherman Attitude Scale was used as the questionnaire to collect data. During the piloting of the questionnaire to 78 students from two schools outside the sample of the study, the Cronbach Alpha reliability score of 0.87 was recorded. Overall, the findings of the study revealed the Bhutanese students attitude towards mathematics to be at a medium level with no significant difference between the male and female students and urban students were observed to exhibit more positive attitude towards mathematics than the rural students.

Key words: Attitude, Bhutanese students, mathematics, mathematics learning, Modified Fennema-Sherman Attitude Scale (MFSAS)

INTRODUCTION

Mathematics has always been featured as a core and compulsory subject in the schools of Bhutan. However, research studies such as the National Education Assessment (NEA, 2003); Education without Compromise (2008); Annual Status of Student Learning (ASSL, 2008, 2010 & 2011); and The Quality of School Education in Bhutan (QSE, 2009) conducted by the Ministry of Education (MoE) and Royal Education Council (REC) among others, have demonstrated that the compulsory status of the subject has done very little to stimulate and motivate Bhutanese students to continue the path of education in mathematics by

---

1. Research Officer, Royal Education Council, Thimphu Bhutan

consistently revealing the underachievement in mathematics. Many Bhutanese who have had firsthand experience of learning mathematics in the Bhutanese classrooms instead of becoming ambassadors to the subject still hold the belief that mathematics is either boring and/or challenging. This belief has resulted in many educated parents willing to accept and tolerate low performance in mathematics. Such belief has continued for more than a century in Bhutan.

International studies such as Program for International Student Assessment (PISA) and Trends in Mathematics and Science Study (TIMSS) have revealed mathematics learning and achievement in students to be a global concern (Mohamed & Waheed, 2011). Explanations and interpretations of underachievement in mathematics have moved away from the cognitive domain to the affective one (McLeod, 1992). Many researchers have investigated factors that influence students' performance and one common factor identified to play a significant role was that of students' attitude (Chamberlin, 2010). Consequently, various studies have been conducted in different countries to ascertain the attitude level of students and to study the correlation between student attitude and academic achievement.

The relationship between student attitude and academic achievement is inconclusive (Zan & Martino, 2007) since studies have revealed both the positive and negative correlations. Nevertheless, there is consensus in literature on the crucial role of developing positive attitude as it influences an individual's thought and behavior. Specifically, student's attitude is recognized to either facilitate or inhibit learning (Yara, 2009). Hence, it is crucial to understand the student's attitude to help stimulate, develop, and encourage learning of mathematics.

There are three reasons for specially choosing grade six students as the focus of the study. First, acknowledging similar assessment undertaken for this grade level in various countries around the world. Second, considering the fact that grade six is the exit level of primary school in Bhutan where many research studies such as the NEA (2003) and QSE (2009) have highlighted the big gap between the current and desired state in the quality of outcomes and processes that exist. Third, in recognition of relevant stakeholders including the students themselves for intervention purposes.

The main purpose of the study was to delve deeper into the cause of underachievement in mathematics by keeping the students– the primary stakeholder, at the center and trying to better understand them by ascertaining their attitude level towards mathematics learning and by checking for any significant difference based on student's gender and location of school.

Research Question

1. What is the students' attitude level towards mathematics?
2. Is there a significant difference in the students' attitude based on gender?

3. Is there a significant effect of the location of school on the students' attitude towards mathematics?

LITERATURE REVIEW

The literature review focused on relevant research studies conducted within Bhutan on mathematics learning and on pertinent literature to do with the student's attitude towards mathematics.

Mathematics Learning in Bhutan

The National Education Assessment (2003), a benchmark study of Bhutanese student's achievement in numeracy and literacy conducted by the MoE with technical assistance of education experts from Australian Council for Educational Research, demonstrated the mathematics achievement of grade six students to be "disappointingly low" with even the "academically better off children performing poorly". It also indicated that "boys outperformed the girls in numeracy" and those "who liked mathematics scored higher" (p.89).

The NEA findings initiated discussion among the educationist and the policy makers, resulting in the Cabinet (Council of Ministers) instituting the 10 member education review commission to do a thorough review of the education sector. The commission came up with the Education without Compromise (2008) document which explicitly acknowledged the concerns expressed by all levels of society over a perceived decline in standards of education with particular reference to Mathematics, English and the Sciences (p.15). Some of the major recommendations made regarding mathematics were: strategic revision of the mathematics syllabus to free up curricular time for a fuller grounding in basic and foundational numeracy skills; and allocation of greater proportion of resources to rural and remote schools (p.34).

The large scale diagnostic assessment study known as the Annual Status of Student Learning (ASSL) was conducted by the Educational Initiatives and the REC in 2008, 2010 and 2011, to check the status of learning of all grade 4, 6 and 8 students in Bhutan. The studies reported that "the level of learning of Bhutanese students is lower than average international levels" when compared to the performance to international benchmark such as TIMSS and PIRLS (ASSL 2008, p.24; ASSL 2010, p.27; ASSL 2011, p.24).

REC and the iDiscoveri Education, India, conducted the study: The Quality of School Education in Bhutan - Reality & Opportunities (QSE, 2009) acknowledging that classrooms remains as black-boxes to policy makers; whose understanding of it are often limited to the inputs going in and the outputs coming out. After reviewing evidences from a number of sources (policy documents, research reports, examination results, synthesis of information from

consultations etc.) the study concluded that a "big gap between the current and the desired state in the quality of outcomes and processes exists" with many students "performing below expectations of their grade level on both basic and advance academic skills and lack basic communication and analytical skills" (p.7). Further, it highlighted that a "majority of the students are not gaining from the learning experience and are at risk of failing in life ahead" (p.50). The report also revealed the following major reasons to be the cause of the above: Lack of unifying set of goals, objectives, and standards for the system; lack of implementation supports to schools; inadequate content knowledge and intellectual preparedness of teachers; and paucity of resources among others (pp. 54 - 55).

Self-esteem of Bhutanese Students

Lhamo (2009) recognizing the need to consider the psychological aspect of a child conducted a preliminary study on the self-esteem of Bhutanese students (158 grade 7 and 8 students). Her study revealed a significant number of Bhutanese students to be suffering from "low self-esteem" with more female students in the lower range. She identified the cause to be the feeling of inadequacy, shortcoming in social skills, physical appearance, teacher - student relationship, and parent - student relationship (pp. 110 - 111).

Attitude towards Mathematics

According to McLeod (1992) the "three major facets of the affective experience of mathematics students that are worthy of further study are beliefs, attitudes, and emotions" (p. 578). DeBellis and Goldin (1997) added the fourth construct to be "values" which included ethics and morals. According to Hannula (2004) most research on affect in mathematics education had used one or more of these four constructs. This study focused on the construct 'attitude' by investigating the Bhutanese grade six students' attitude.

The construct attitude finds its origin in social psychology (Allport, 1935). McLeod (1992) highlighted the problem of transferred concepts from psychology to mathematics education by stating:

> Terms sometimes have different meanings in psychology than they do in mathematics education and even within a given field, studies that use the same terminology are often not studying the same phenomenon... Clarification of terminology for the affective domain remains a major task for researchers in both psychology and mathematics education. (p.576)

For over 40 years mathematics educators have been creating instruments to assess affect by using the construct attitude (Chamberlin, 2010), yet there

seems to be "no universally accepted definition for the term" (Walsh, 1991, p. 6). This lack of clarity in the definition of the construct attitude is shown by the lack of a theoretical framework that characterizes research on attitude (Zan & Martino, 2007). Zan and Martino also pointed out that "a variety of definitions of attitude is not limiting but rather enriching for researchers, since different research problems can require different definitions" (Zan & Martino, 2007, p.29).

Zan and Martino (2007) in their analysis of academic papers stated that the definition of attitude towards mathematics in research could be categorized into three types namely:

1. A simple definition of attitude that describes a positive or negative degree of affect associated with a certain subject,

2. A bi-dimensional definition where attitude towards mathematics is seen as a pattern of beliefs and emotions associated with mathematics, and

3. A multi-dimensional definition where three components: emotional response, beliefs regarding the subject, and behavior related to the subject, constitute attitude. (p. 158)

In this study the multi-dimensional definition of attitude was considered and the adapted version of the Fennema-Sherman Attitude Scale (FSAS) selected as the research instrument as it is the best example of a high amount of usage in the field of mathematics education (Chamberlin, 2010, p.171) and because of the fact that many researchers have successfully used it across the globe in varied contexts (Tahar, Ismail, Zamani & Adnan, 2010; Maat & Zakaria, 2010; Bramlett & Herron, 2009; Schenkel, 2009; van der Sandt, 2007; Tapia & Marsh, 2004, Ashcraft & Kirk, 2001; Furinghetti & Pehkonen, 2000; Sherman & Christian, 1999; Schoenfeld, 1992; Thompson, 1992; Fennema & Sherman, 1976). TIMSS and PISA have also used an adapted and shortened version of the FSAS to measure the attitude towards mathematics in several international settings (Metsämuuronen, 2012).

METHODOLOGY

This cross-sectional study employed the survey method. An adapted version of the Modified FSAS (MFSAS) was used as the questionnaire to collect data. After studying the available data from the Annual Education Statistics 2013, the country was divided into four strata with each containing a *Thromde* (locally governed municipality) and some nearby *Dzongkhags* (Districts). To ensure the actual population was represented in the selection of the sample, proportionate selection from the four strata and the different location areas (Urban, Semi-

Urban, Semi-Remote, Remote, Very-Remote and Difficult) was done using a two-stage probabilistic sampling procedure. Schools and students (Table 1) were selected at random using the free random number generator available online at http://www.random.org/integers/. The required sample size of 374 students (male = 182 and female = 192) from 33 schools (which included 2 private schools) across the country from all location areas was determined using the formula (Equation 1) published by the research division of the NEA, US, (Krejcie & Morgan, 1970) and Equation 2 to ensure proportionate selection from all four strata.

Equation 1. Formula for calculating the required sample size

Required Sample Size, n $= \dfrac{X^2 \, N \, P \, (1\text{-}P)}{d^2 \, (N\text{-}1) + X^2 \, P \, (1\text{-}P)}$ ------------- Equation 1

Where,

X^2 is the table value of Chi-Square @ d.f. = 1 for desired 95 % confidence level = 3.841

N is the total population size of grade 6 students = 14,522 (AES, 2013)

P is the population proportion (assumed to be 0.5 since this would provide the maximum sample size)

d is the degree of accuracy = 0.05

Equation 2. Formula for calculating the required strata sample size

Required strata sample size, $n_i = \dfrac{N_i}{N} * n$ -------------- Equation 2

Where,

N_i is the population of grade six students in the ith strata (where i = 1, 2, 3 and 4)

N is the total population of grade six students = 14,522

n is the total required sample size of grade six students = 374

Table 1. Strata Matrix

Strata	Schools[1]	Total population		Sample used in this study	
		Students	Schools	Students	
	Thimphu Thromde	24	1761	2 (1 Pvt.)	29
	Thimphu	9	260	1	11
	Paro	14	747	1	20
S1	Punakha	15	542	1	17
	Wangdue Phodrang	22	681	2	23
	Haa	7	217	1	10
	Gasa	3	57	0	0
Strata S1 Total		94	4265	8	110
	Phuensholing Thromde	4	419	1	7
S2	Chhukha	29	1043	2 (1 Pvt.)	30
	Dagana	19	734	2	25
	Samtse	20	1359	2	30
Strata S2 Total		72	3555	7	92
	SJ Thromde	2	212	1	7
	Samdrup Jongkhar	19	604	1	11
	Lhuntse	17	374	1	9
S3	Mongar	34	803	2	25
	Pema Gatshel	24	545	1	11
	Trashigang	53	1065	2	32
	Trashiyantse	22	490	1	10
Strata S3 Total		171	4093	9	105
	Gelephu Thromde	1	199	1	5
	Sarpang	14	748	2	19
S4	Trongsa	17	326	1	7
	Bumthang	14	336	1	6
	Zhemgang	19	467	2	14
	Tsirang	11	533	2	16
Strata S4 Total		76	2609	9	67
Grand Total (S1+S2+S3+S4)		413	14522	33	374

1. Schools with grade six level   43

Instrumentation

Researchers interested in measuring people's underlying attitude often collect Likert data by administering a survey (Javaras, 2004). Survey is a method of gathering data from a selected group of people, in their natural environment, for a specific purpose and it has been acknowledged by research to be a good tool in gathering information to do with people's attitudes, feelings, opinions, and other such self-reported behavior (Neumann, 2006).

The adapted version of the MFSAS was piloted to 78 grade six students of two schools outside the sample of the study to test the adequacy of the instrument by conducting a reliability and validity test. No student or school opted out of this study despite the voluntary nature and it being conducted just before the mid-term examination. According to Field (2009), the Cronbach Alpha score of 0.8 is reliable. During the piloting of the questionnaire the Cronbach Alpha reliability score of 0.87 was recorded. Students' feedback was collected on the questionnaire after which minor changes were made to the questionnaire to make it contextually relevant. Another round of random check of the questions with random grade six students outside the sample was done to check if they understood the questions. On average students took about 45 minutes to complete the questionnaire.

Data Collection

Permission for the study was secured from the REC and the MoE. First at REC, the feedback and comments from the program directors and researchers was incorporated. The research proposal was submitted to the MoE for approval to collect data from randomly selected schools across the country.

Upon receiving the approval letter from the MoE, the concerned District Education Officers (DEOs) were accordingly informed. The tentative dates for the survey were scheduled in consultation with the concerned school principals. Due to the geographical spread of the schools in Bhutan and the tight timeline of six months, less than a month was used for data collection. Some officials of REC who had experience in data collection were requested to help with the administration of the survey. All survey administrators were provided enumerator training by the researcher and the findings of the pilot study were also shared so as to mentally prepare them for the survey.

This study was made voluntary for the schools as well as for the grade six students so that neither the school nor the student felt any pressure. Further, anonymity and confidentiality was assured and maintained.

METHOD OF ANALYSIS

Data were analyzed using the Statistical Package for Social Sciences (SPSS) version 20 with the alpha for testing of null hypothesis set at 0.05 level

of significance (95% Confidence Interval) and 5% margin of error. Wherever appropriate, Microsoft Excel 2013 was used to modify and create user-friendly charts.

The analysis of the quantitative data included descriptive statistics such as frequency, percent, measure of central tendency (mean, median and mode) and standard deviation. Parametric tests such as independent samples *t*-test and ANOVA were also calculated and used to test the hypothesis and make the necessary inference.

Type of Likert Scale Analysis Done

Upon reviewing various research studies, the controversy in the type of statistical analysis possible when using Likert scale was observed. For example, Jamieson (2004) questioned the use of Likert scale as an interval level measurement by stating that "Likert scales fall within the ordinal level of measurement" (p.1217). Hence, data were cautioned from being interpreted using the mean, standard deviation, and parametric tests such as ANOVA. Motivated by Jamieson's article, Carifio and Perla (2007) published an article as a mean to dispel misunderstanding, misconception, and myths associated with the statistical analysis of Likert Scales. According to them "it is perfectly acceptable and correct to analyze the results at the measurement scale level using parametric analyses techniques such as the F-Ratio or the Pearson correlation coefficients or its extensions" (p.115).

Boone and Boone (2012) stated that the Likert scale is a composite score of four or more Likert-type items and should be analyzed at the interval measure scale. Descriptive statistics such as the mean for central tendency and standard deviation for variability was recommended by them, while data analysis procedures such as Pearson's r, t-test, ANOVA, and regression were deemed appropriate.

In this study, it was noted that the MFSAS (46 items) consisted of more than 10 Likert-type items, hence, the composite score as recommended by Boone and Boone (2012) and the measurement scale as suggested by Carifio and Perla (2007) were considered and accordingly analysis was conducted to make the necessary inference.

ANALYSIS AND FINDING

Students' Attitude towards Mathematics

Research Question 1: What is the students' attitude level towards mathematics?

There were 46 Likert-type items, half of which were negative items, with five possible response options namely: Strongly Disagree (SD), Disagree (D),

Not Sure (N), Agree (A) and Strongly Agree (SA). The scoring base point for each positive item were as follows: SD = 1, D = 2, N = 3, A = 4 and SA = 5 and for each negative item the score was reversed such that SD = 5, D = 4, N = 3, A = 2 and SA = 1. The lowest possible score was 46 and the highest score was 230. This score range was divided into 3 categories of attitude level: low, medium, and high as shown in Table 2.

Table 2. Criteria for level of attitude towards mathematics

Mean Score	Level of Attitude
46.0 - 107.3	Low
107.4 - 168.7	Medium
168.8 - 230.0	High

Table 3 reveals the overall attitude towards mathematics of both male (*M* = 161.58, *SD* = 16.26) and female (*M* = 162.19, *SD* = 20.04) students to be at the medium level.

Table 3. Overall attitude towards mathematics

	Gender	N	Mean Score	Std. Devi-ation	Level of Attitude
Attitude to-wards mathe-matics	Male	182	161.58	16.26	Medium
	Female	192	162.19	20.04	Medium

Figure 1 shows detailed breakdown of responses categorized into four domains. More than 70 percent of the students agreed on the usefulness scale; while about 55 percent of students agreed on the teacher attitude scale and the personal confidence scale; and a little more than 40 percent of students agreed on the male domain scale.
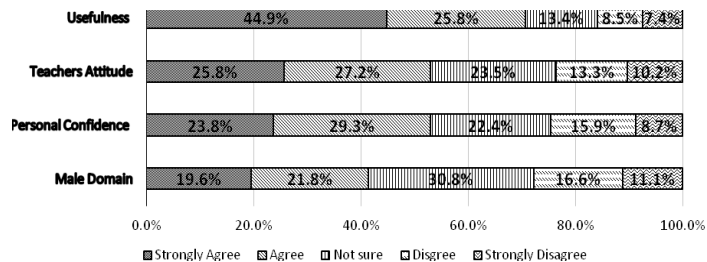
Figure 1. Details of the overall students' attitude towards mathematics

Research Question 2: Is there a significant difference in the students' attitude towards mathematics based on their gender?

Null Hypothesis: There is no significant difference in the male and female students' attitude towards mathematics at a 0.05 level of significance.
- Dependent variable – students' attitude towards mathematics
- Independent variable – gender of student

An independent samples *t*-test was conducted to compare the male and female students' attitude towards mathematics (Table 4). There was no significant difference in the attitude towards mathematics between male ($M = 161.58$, $SD = 16.26$) and female ($M = 162.19$, $SD = 20.04$) students; $t(363) = -.321$, $p = .748$, 95% CI [-4.31, 3.10]. Hence, the null hypothesis that there is no significant difference in the male and female students' attitudes towards mathematics at 0.05 level of significance is accepted.

Table 4. Independent samples t-test on attitude towards mathematics and gender

		Levene's Test for Equality of Variances		*t*-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Over-all atti-tude to-wards math	Equal vari-ances as-sumed	9.77	.002	-.320	372	.749	-.61	1.89	-4.33	3.12
	Equal vari-ances not as-sumed			-.321	363.4	.748	-.61	1.88	-4.31	3.10

Research Question 3: Is there a significant effect of the location of school on the students' attitude towards mathematics?

Null Hypothesis: There is no significant effect of the location of school on student' attitude towards mathematics at 0.05 level of significance.

- Dependent variable – students' attitude towards mathematics

- Independent variable – location of school

A one-way ANOVA was conducted to compare the effect of the location of school on students' attitude towards mathematics (Table 5 and 6). There was a statistically significant difference between groups: U ($M = 163.72$, $SD = 17.14$),

SU (M = 165.78, SD = 17.5), SR (M = 163.14, SD = 19.54), R (M = 165.16, SD = 18.06), VR (M = 153.33, SD = 6.98), D (M = 143.74, SD = 7.96); F $(5,368)$ = 4.93, p < .001. Hence, the null hypothesis that there is no significant effect of the location of school on students' attitude towards mathematics at 0.05 level of significance is rejected.

A Post Hoc Comparison using the Tukey HSD test was conducted to compare all pairs of mean score to determine if they were significantly different (Table 7). The Tukey post-hoc test revealed the following pairs of group attitude towards mathematics to be significantly different at p < .05: Urban (M = 163.72, SD = 17.14) and Difficult (M = 143.74, SD = 7.96); Semi-Urban (M = 165.78, SD = 17.50) and Difficult (M = 143.74, SD = 7.96); Semi-Remote (M = 163.14, SD = 19.54) and Difficult (M = 143.74, SD = 7.96); and Remote (M = 161.16, SD = 18.06) and Difficult (M = 143.74, SD = 7.96).

There was no significant difference in the attitude level of students from Very Remote and Difficult areas at p = .86.

Table 5. Descriptive statistics on attitude towards mathematics and location of school

	N	Mean	Std. Devi-ation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Urban	95	163.72	17.14	1.76	160.22	167.21	124	208
Semi-Urban	37	165.78	17.50	2.88	159.95	171.62	138	208
Semi-Remote	120	163.14	19.54	1.78	159.61	166.67	93	211
Remote	97	161.16	18.06	1.83	157.52	164.81	113	215
Very Remote	6	153.33	6.98	2.85	146.01	160.65	143	162
Difficult	19	143.74	7.96	1.83	139.90	147.57	129	162
Total	374	161.89	18.28	.95	160.03	163.75	93	215

Table 6. Analysis of variance on the attitude towards mathematics and location of school

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	7817.16	5	1563.43	4.93	.000
Within Groups	116792.57	368	317.37		
Total	124609.72	373			

Table 7. Tukey HSD Post Host Test on attitude towards maths and location of school

(I) Location of School	(J) Location of School	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Urban	Semi-Urban	-2.07	3.45	0.991	-11.96	7.82
	Semi-Remote	0.57	2.45	1	-6.43	7.58
	Remote	2.55	2.57	0.92	-4.82	9.92
	Very Remote	10.38	7.50	0.736	-11.10	31.87
	Difficult	19.98*	4.48	0	7.15	32.81
Semi-Urban	Urban	2.07	3.45	0.991	-7.82	11.96
	Semi-Remote	2.64	3.35	0.969	-6.95	12.24
	Remote	4.62	3.44	0.761	-5.24	14.48
	Very Remote	12.45	7.84	0.607	-10.01	34.91
	Difficult	22.05*	5.03	0	7.64	36.45
Semi-Remote	Urban	-0.57	2.45	1	-7.58	6.43
	Semi-Urban	-2.64	3.35	0.969	-12.24	6.95
	Remote	1.98	2.43	0.965	-4.99	8.95
	Very Remote	9.81	7.45	0.776	-11.54	31.16
	Difficult	19.40*	4.40	0	6.80	32.01

Remote	Urban	-2.55	2.57	0.92	-9.92	4.82
	Semi-Urban	-4.62	3.44	0.761	-14.48	5.24
	Semi-Remote	-1.98	2.43	0.965	-8.95	4.99
	Very Remote	7.83	7.49	0.902	-13.64	29.30
	Difficult	17.43[*]	4.47	0.002	4.62	30.23
Very Remote	Urban	-10.38	7.50	0.736	-31.87	11.10
	Semi-Urban	-12.45	7.84	0.607	-34.91	10.01
	Semi-Remote	-9.81	7.45	0.776	-31.16	11.54
	Remote	-7.83	7.49	0.902	-29.30	13.64
	Difficult	9.60	8.34	0.86	-14.30	33.50
Difficult	Urban	-19.98[*]	4.48	0	-32.81	-7.15
	Semi-Urban	-22.05[*]	5.03	0	-36.45	-7.64
	Semi-Remote	-19.40[*]	4.40	0	-32.01	-6.80
	Remote	-17.43[*]	4.47	0.002	-30.23	-4.62
	Very Remote	-9.60	8.34	0.86	-33.50	14.30

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

Figure 2 provides a visual representation of the results. The error bar shows the mean score difference at 95 percent confidence level in the students' attitude towards mathematics by location of school. The actual mean score lies within the center circle in the error bar, while the arms of the bar represent the 95 percent chance of the mean score being around the circle. In other words, if this study were to be conducted 100 times then 95 times the mean score of the attitude towards mathematics would lie within the illustrated error bar.
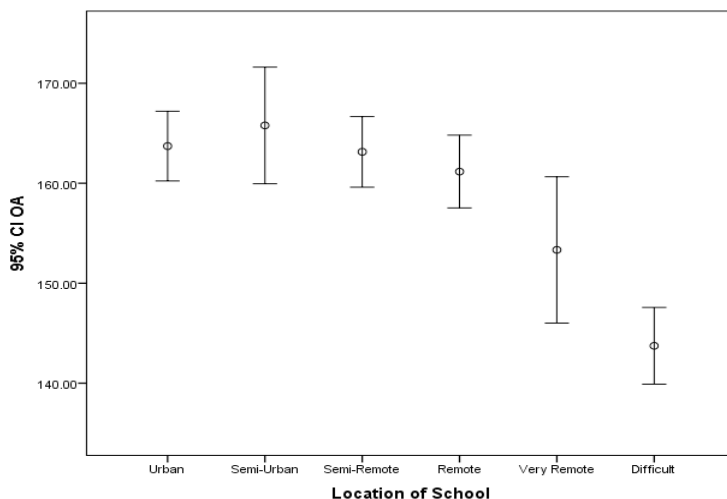
Figure 2. Error bar showing mean score difference in attitude towards math by location

DISCUSSION

Bhutanese Students' Attitude towards Mathematics

This study revealed the Bhutanese students' attitude towards mathematics to be at the medium level. It is important to understand that the overall attitude was tested on the four domains: usefulness of the subject, teacher's attitude towards the student, personal confidence of students, and mathematics as a male domain. The usefulness of mathematics as a subject was discovered to be the domain that influenced the overall positive attitude of students the most. This finding is in agreement with studies conducted in Singapore by Fan et al. (2005) and in Hong Kong by Wong, Lam, Wong, Leung and Mok (2001). On one hand, this finding can be viewed as very promising since Bhutanese students seem to understand the practicality and usefulness of mathematics like those students in Singapore and Hong Kong. On the other hand, this revelation leads to another pertinent question: If mathematics is viewed as being very useful by the primary students then why are there very few Bhutanese taking up mathematics in higher education?

Gender comparison of attitudes of grade 6 students towards mathematics

Studies such as NEA (2003) and ASSL (2008, 2009, & 2010) conducted in Bhutan have demonstrated that male students performance and achievement in mathematics is significantly better than that of the female students. However,

51

this study revealed no significant difference in the mean score between male and female students attitude towards mathematics. In other words, the attitude of students towards mathematics did not depend upon gender whereby establishing that mathematics is neither a male nor female dominated subject in Bhutan. This finding is similar to the findings of the study conducted in Lahore, Pakistan, by Farooq and Shah (2008); in Shillong, India, by Lamar (2014); and in Ekiti State, Nigeria, by Adebule and Aborisade (2014), where they too concluded that the gender differential had no impact on the attitude of students towards mathematics. On the contrary, there are studies such as the one conducted by Mahanta and Islam (2012) that showed that Rajasthani male students had more positive attitude towards mathematics than the female students and that the attitude and achievement was positively correlated.

Location of school comparison of grade 6 students towards mathematics

This study established that the attitude towards mathematics of urban students was more positive attitude than the rural students. This finding agreed with the findings of Rosaly (1990) who demonstrated that urban students have more positive attitude than the rural students while studying the relationship between attitude and achievement in mathematics.

A statistically significant difference in the attitudes of all locations against the very-remote and difficult areas strongly indicates that something is amiss despite all the effort made by the government to minimize the disparity caused due to location of school. Further, it should be noted that almost all the students from the schools located in the difficult areas found the usage of English language as the medium of instruction challenging to comprehend and understand. They also indicated word problems to be the most difficult in mathematics. This observation indicates that much needs to be done in the schools located at the very remote and difficult areas to provide an equal grounding for all students.

CONCLUSION

The study demonstrated that the Bhutanese students' attitude towards mathematics is at a medium level with the usefulness of the subject playing a significant role in influencing the overall positive attitude. The attitude of students towards mathematics did not depend upon gender, however, the urban students were observed to exhibit more positive attitude than the rural students.

REFERENCES

Barmby, P., Harries, T., Higgins, S., & Suggate, J. (2007). How can we assess mathematical understanding?. In *Proceedings of the 31st Conference of the International Group for the Psychology of Mathematical Education,* 2, 41-48.

Boone, H. N., & Boone, D. A. (2012). Analyzing likert data. *Journal of Extension*, *50*(2), 1-5.

Calder, N. & Brough, C. (n.d.). *Child-centred inquiry learning: How mathematics understanding emerges.* Univeristy of Waikato. Retrieved from http://www.cimt.plymouth.ac.uk/journal/calder.pdf

Carifio, James & Perla, Rocco J. (2007): Ten common misunderstandings, misconceptions, persistent myths and urban legends about Likert scales and

Likert response formats and their antidotes, *Journal of Social Sciences*, 3(3), 106 - 116.

Chamberlin, S. A. (2010). A review of instruments created to assess affect in Mathematics. *Journal of Mathematics Education*, 3(1), 167-182.

Doepken, D., Lawshey, E., & Padwa, L. (1993). *Modified Fennema-Sherman Mathematics Attitudes Scales*. Retrieved from https://www.google.bt/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0CCsQFjAA&url=http%3A%2F%2Fteacherleaders.files.wordprescom%2F2013%2F07%2Fmodified-fennema-math-attitude.doc&ei=nJ8U9L-BuiM0AXMh4C4Cg&usg=AFQjCNHKkS8MohiI7ZOgJ4V9DnIk4-BoXg&bvm=bv.67229260,d.d2k

Education Sector Review Commission. (2008). *Education without compromise*. Thimphu, Bhutan: Royal Government of Bhutan, Council of Ministers.

Fan, L., Quek, K. S., Zhu, Y., Yeo, S. M., Pereira-Mendoza, L., & Lee, P. Y. (2005). Assessing Singapore students' attitudes toward mathematics and mathematics learning: Findings from a survey of lower secondary students. Retrieved from https://repository.nie.edu.sg/handle/10497/3345

Farooq, M. S., & Shah, S. Z. U. (2008). Students' attitude towards mathematics. *Pakistan Economic and Social Review*, 75-83.

Godino, J. D. (1996). Mathematical concepts, their meanings and understanding. In *18th PME conference*, 2, 2-417. Retrieved from http://www.ugr.es/~jgodino/articulos_ingles/meaning_understanding.pdf

Hannula, M. S. (2002). *Attitudes towards Mathematics: Emotions, Expectations and Values. Education Studies in Mathematics*. Kluwer Academic Publishers. 49, 25-46. Retrieved from http://cimm.ucr.ac.cr/usodetecnologia/Uso%20de%20tecnologia/PDF,%20Viejos%20y%20Nuevos%20

(uso%20de%20tecnologia)/Hannula%20Markku%20S.%20Attitude%20 Towards%20Mathematics...pdf

Jamieson, S. (2004). Likert scales: how to (ab) use them. *Medical education*, *38*(12), 1217-1218. Javaras, K.N. (2004). *Statistical analysis of Likert data on attitude*. University of Oxford. Retrieved from http://ora.ox.ac. uk/objects/uuid:50754d97-86c2-433d-96b0-319787ece3e5/datastreams/ THESIS01

Kalder, R. S. & Lesik, S. A. (2011). *A classification of attitudes and beliefs towards mathematics for secondary mathematics pre-service teachers and elementary pre-service teachers: An exploratory study using latent class analysis*. Retrieved from http://www.k-12prep.math.ttu.edu/journal/attri- butes/kalder01/article.pdf

Kaiser, G. (1993). Results of an empirical study into gender differences in at- titudes towards mathematics. *Educational Studies in Mathematics*, *25*(3), 209-233.

Krejcie, R. V. & Morgan, D.W. (1970). Determining sample size for research activities*. Educational and Psychological Measurement*, 30, 607-610.

Lamar, R. (2014). Attitude of higher secondary students in Shillong towards Mathematics. *IOSR Journal of Humanities and Social Science*, *19*(3), 42-45.

Larsen, J. (2013). *Attitude in Mathematics – A Thematic Literature Review*, Simon Fraser University. Retrieved from http://judy-larsen.weebly.com/ uploads/1/7/7/5/17756331/attitude_literature_review_-_larsen.pdf

Lhamo, N. (2008, December 7-10). A preliminary study on self-esteem of Bhutanese students. Paper presented at the Proceedings of Nation- al Seminar, 95-114. Paro, Bhutan: Centre for Educational Research & Development. Retrieved from http://www.pce.edu.bt/sites/default/files/ Quality%20of%20Education%20II.pdf

Mahanta, S., & Islam, M. (2012). Attitude of secondary students towards mathematics and its relationship to achievement in mathematics. *Interna- tional Journal of Computer Technology and Applications*, *3*(2).

Mata, M. L. & Monteiro, V & Peixoto, F. (2012). *Attitudes towards Math- ematics: Effects of individual, motivational, and social support factors*. Hindawi Publishing Corporation. Retrieved from http://www.hindawi. com/journals/cdr/2012/876028/

McLeod, D. B. (1992). Research on affect in mathematics education: A reconceptualization. *Handbook of research on mathematics teaching and learning*, 575-596. Retrieved from http://www.peterliljedahl.com/wp-con- tent/uploads/Affect-McLeod.pdf

Mensah, J. K., Okyere, M., & Kuranchie, A. (2013). Student attitude towards Mathematics and performance: Does the teacher attitude matter? *Journal*

of Education and Practice, *4*(3), 132-139.

Metsämuuronen, J. (2012). Challenges of the Fennema-Sherman test in the international comparisons. *International Journal of Psychological Studies*, *4*(3), p1.

Ministry of Education. (2013). *Annual education statistics*. Thimphu, Bhutan: Ministry of Education.

Ministry of Education. (2003). *National Education Assessment in Bhutan: A benchmark study of student achievement in Literacy and numeracy at Class VI*. Thimphu, Bhutan

Mohamed, L., & Waheed, H. (2011). Secondary students' attitude towards mathematics in a selected school of Maldives. *International Journal of Humanities and Social Science*, *1*(15), 277-281.

Mullis, I. V., Martin, M. O., Gonzalez, E. J., & Chrostowski, S. J. (2004). *TIMSS 2003 International Mathematics Report: Findings from IEA's Trends in International Mathematics and Science Study at the Fourth and Eighth Grades*. TIMSS & PIRLS International Study Center. Boston College, 140 Commonwealth Avenue, Chestnut Hill, MA 02467.

Neuman, S. B. (2006). The knowledge gap: Implications for early education. *Handbook of early literacy research*, 2, 29-40. Retrieved from http://www.sbneuman.com/pdf/knowledgegap.pdf

Newton, D. P. (2001). Helping children to understand. *Evaluation & Research in Education,* 15(3), 119-127.

Palacios, A., Arias, V., & Arias, B. (2014). Attitudes towards mathematics: construction and validation of a measuring instrument. *REVISTA DE PSICODIDACTICA*, *19*(1), 67-91.

Perger, P. (n.d.). *What they say what they do understanding student's perceptions. Retrieved from http://www.cimt.plymouth.ac.uk/journal/perger.pdf*

Planning Commission. (1999). Bhutan 2020: A Vision for Peace, Prosperity and Happiness. *Royal Government of Bhutan.* Thimphu, Bhutan

Royal Education Council & Educational Initiatives. (2008). *Bhutan's Annual Status of Student Learning*. Thimphu, Bhutan

Royal Education Council & iDiscoveri Education. (2009). *The quality of school education in Bhutan – Reality and opportunities*. Thimphu, Bhutan

Royal Education Council & Educational Initiatives. (2010). *Bhutan's annual status of student learning*. Thimphu, Bhutan

Royal Education Council & Educational Initiatives. (2011). *Bhutan's Annual Status of Student Learning*. Thimphu, Bhutan

Sachs, J., & Leung, S. O. (2007). Shortened versions of Fennema-Sherman Mathematic Attitude Scales employing trace information. *Psychologia*, *50*(3), 224-235.

Skemp, R. (1976). Relational understanding and instrumental understanding.

Mathematics Teaching, 77, 20-26. Department of Education, University of Warwick.

Stylianides, A. J. & Stylianides, G. J. (2007). Learning mathematics with understanding: A critical consideration of the learning principle in the principles and standards for school mathematics. *The Montana Mathematics Enthusiast*, 4(1), 103-114.

Tapia, M. & Marsh, G. E. (2000). *Attitudes towards mathematics instrument: An investigation with middle school students.* Retrieved from http://www. pearweb.org/atis/tools/48

Walsh, C. F. (1975). *The relationship between attitudes towards specific mathematics topics and achievement in those domains*. The University of British Columbia. Retrieved from https://circle.ubc.ca/bitstream/handle/2429/1784/ubc_1992_spring_walsh_carmel.pdf?sequence=1

Wong, N. Y., Lam, C. C., Wong, K. M. P., Leung, F. S., & Mok, I. C. (2001). Students' views of mathematics learning: A cross-sectional survey in Hong Kong. *Education Journal*, 29(2), 37-60.

Yara, P. O. (2009). Students' attitude towards mathematics and academic achievement in some selected secondary schools in Southwestern Nigeria. *European Journal of Scientific Research,* 36(3), 336-341.

Zan, R., Brown, L., Evans, J., & Hannula, M. S. (2006). Affect in mathematics education: An introduction. *Educational studies in mathematics*, *63*(2), 113-121.

Zan, R., & Martino, P. D. (2007). Attitudes towards mathematics: Overcoming positive/negative dichotomy. *The Montana Mathematics Enthusiasts*, 157-168.

Influence of Principal Leadership on English as Second Language Teacher Empowerment in Bhutan

Phub Dorji[1] and Songsiri Soranastaporn[2]

Abstract

The purpose of this quantitative study was: (1) to find the leadership behaviour of principals as perceived byESL teachers in the schools of central Bhutan, (2) to identify ESL teachers' perceived level of empowerment, and (3) to examinethe relationship between principal leadership and teacher empowerment. Thepopulationconsisted of 88 ESL teachers of Trongsa district, Central Bhutan. Bolman and Deal's (1991) Leadership OrientationQuestionnaire (LOQ) withthe total Cronbach's alpha reliability coefficient of .98 was used to examineprincipal leadership behaviours. Short and Rinehart's (1992) School ParticipantEmpowerment Scale (SPES) with a total Cronbach's alpha of0.94 was used to examineteacher empowerment as perceived by the ESL teachers. The mean andstandard deviation were computed for LOQ and SPES toexamine principal leadership behaviours andteachers' perceived empowerment. Pearson correlation and regression analysis were computed to find the relationship between principal leadership and teacher empowerment. The study revealed medium level of use of leadership frames by the principals.Although the study revealed the prevalence of empowerment in certain dimensions (self–efficacy: M=3.63, SD=.78; status: M=3.53, SD=.71), teachers perceived lowlevel of empowerment in 'decision making' (M=2.69, SD=.95) and 'autonomy' (M = 2.88, SD=.98) dimensions. Pearson correlations and regression analyses indicated the relationship and influence of principals' leadership behaviours on teacherempowerment.

Key words: Principal leadership, empowerment, framework

Introduction

A principal with strong leadership abilities and empowering behaviours is required when schools are held accountable for the standard of education (Darling-Hammond, LaPointe, Meyerson, Orr, & Cohen, 2007; Shelton, 2011). Research indicates that teacher empowerment is a positive factor in the organizational settings of schools. Short and Rinehart (1992) stated that the

1. M.A student in Applied Linguistics, Mahidol University, Thailand
2. Associate Professor, Faculty of Liberal Arts, Mahidol University, Thailand

success of a school depends on the extent to which teachers are empowered in the decision making processes. Moreover, when teaching of language is considered as one of the diversified subjects requiring teachers' flexibility in instruction and innovations, effective principals are therefore, required to employ assorted leadership skills to empower English as Second Language (ESL) teachers.

Bhutan is undergoing a political and social change which demands a reform in the current education system (Dorji & Soranastaporn, 2015; Royal Education Council (REC, 2012). A recent move towards democracy invites policy advancements in Bhutanese education system to enable significant progress in expanding its educational institutions and strengthening the quality of education (REC, 2012).The research on the quality of school education in Bhutan suggests that the attempt at reforming the system has failed to bring desired changes as a result of incompetent leaders and ineffective ESL teachers (Royal Government of Bhutan (RGoB, 2008). The Education Sector Review Commission's report (RGoB, 2008) and the Royal University of Bhutan's Strategic Plan (2007a) showed that the schools are in short of skilled leaders and effective ESL teachers. LaPrairie (2013) concurred that the production of under-prepared ESL teachers from the teacher training colleges in Bhutan has impeded quality language teaching. Poor content knowledge and pedagogical skills, lack of collaboration, and lack of effective professional development programmes are some of the factors contributing to ESL teachers' ineffectiveness (Dorji & Soranastaporn, 2015; iDiscoveri Education & REC, 2009; LaPrairie, 2013).

In addition, the lack of competent instructional leaders in schools inhibit teacher professionalism and retention. Research findings suggest that principal recruitment criteria are ineffective in drawing out competent and qualified principals in Bhutan (iDiscoveri Education & REC, 2009). The evidence of a need for effective principal recruitment criteria is observed in the National Education Framework of Bhutan (REC, 2012) that, "Principals are drawn from the same cohort as teachers and do not undergo rigorous standards for selection" (p.44). As a result of ineffective recruitment criteria, most of the principals fail to exhibit leadership qualities as they lack skills to observe and coach teachers, make curricular improvements and model effective practice (iDiscoveri Education & REC, 2009).

Similarly, the continuous occurrence of problems like teacher attrition in Bhutanese Education system needs a careful study (Dorji & Soranastaporn, 2015). According to the Annual Education Statistics of Bhutan (2014, p.22), "about four percent of the teachers in government schools leave the profession every year for various reasons". The voluntary resignation of 115 teachers from teaching profession between the year 2013 and 2014 as per the statistics alone leaves questions to be explored in order to understand why teachers opt for resignation.

There are numerous empirical records of studies regarding principal effectiveness. However, little data has been gathered concerning the relationship between teachers' perception of principal leadership and teacher empowerment. As current reform movements require collaborative school environments, principals' leadership style in relation to teacher empowerment needs careful examination (Dorji & Soranastaporn, 2015; Sharp, 2009). Thus, this study evaluated the level of ESL teacher empowerment as perceived by ESL teachers of Trongsa district in Central Bhutan. It also assessed leadership behaviors of the principals as perceived by the ESL teachers. In addition, the correlation between principal leadership and teacher empowerment were examined. The following research questions guided this study.

1. What leadership behaviors are exhibited by the principals in the schools of Bhutan as perceived by the ESL teachers?
2. To what extent do ESL teachers feel that they are empowered?
3. What is the relationship between ESL teacher's perception of principal leadership and teacher empowerment?

Theoretical Framework of the Study

While research on principal leadership and teacher empowerment is rising (Crowther, 2009), questions on successful leadership styles and behaviors perceived as critical to empower teachers to make the schools effective still remains vague (Dorji & Soranastaporn, 2015). Though many previous studies in Bhutan have focused on principal leadership, a very little or no studies were conducted on teacher empowerment as a measure to increase the effectiveness of schools (Dorji & Soranastaporn, 2015; Sharp, 2009). Moreover, there is no research done from teachers' perspectives on the characteristics, behaviors, strategies, and practices, which principals use to empower teachers. Addressing the challenges discussed so far needs an investigation into principal's leadership behaviors and ESL teacher empowerment practices in Bhutanese schools for effective education reform to take place.

In this section, theoretical background on Principal leadership, Bolman and Deal's (1991) Leadership Orientation Framework, Teacher Empowerment, and Short and Rinehart's (1992) School Participant Empowerment Scale are discussed.

Principal Leadership

Most of the studies in the past were focused on instructional and transformational leadership (Kurtz, 2009). During the 1980s, researches were focused on instructional leadership where principals possessed the ultimate control in making decisions related to curriculum and instruction (Hallinger &

Murphy, 1985). The focus of 1990's transformational leadership (TL) approach was characterized by shared leadership, learning communities, and teacher leadership essential to create effective schools (Bass, 1996; Bass & Avolio, 1993; Kurtz, 2009). However, the drawbacks in these leadership styles encouraged the researchers to embark on studies that embrace diverse leadership roles and responsibilities. Bolman and Deal's (1991) four-framed leadership styles became a much preferred styles of leadership that has the blend of both instructional and transformational leadership skills and practices (Dorji & Soranastaporn, 2015).

Bolman and Deal's Leadership Orientation Framework

Bolman and Deal's (1991) leadership orientation frameworks categorize leadership behaviors as: Structural frame, Human Resource frame, Political frame, and Symbolic frame. "Frames are both windows on the world and lenses that bring the world into focus. Frames filter out some things but allow others to pass through easily. Frames help us order experiences and decide what to do" (Bolman & Deal, 1991, p. 16). A description of each frame is provided below. *The structural frame* emphasizes on goals, roles, and relationships. A good leader is someone who thinks clearly, makes the right decisions, has good analytic skills, and can design structures and systems for the success of the school. They focus on structure, strategy, environment, implementation, experimentation, and adaptation (Bolman & Deal, 1991).

The human resource frame considers organizations as extended family with every individual possessing diverse needs, feelings, discriminations, skills, and restrictions. Human resource leaders act as a catalyst or servant whose leadership style is to support, advocate, and empower (Bolman & Deal, 1991). Such leaders believe in the importance of coaching, participation, motivation, teamwork, and good interpersonal relations. A good leader is a facilitator who supports and empowers others.

If viewed from the political frame, organizations are seen as arenas, contests, or jungles (Bolman & Deal, 1991). Political leaders believe that conflict and scarce resources are everyday confrontations that the managers and leaders live with. A good political leader understands politics and is comfortable with conflict.

The symbolic frame sees organizations as culture oriented and motivated by rituals, ceremonies, stories, heroes and myths rather than by rules, policies and managerial authority (Bolman & Deal, 1991). Organization is compared to a theater where actors perform their roles while audiences have freedom to shape their own intuitions from what is received from the actors. Symbolic leaders believe that vision and inspiration can be etched in the participants through their personal charisma and a flair for plays. To instill and restore hope and meaning, a good leader uses symbols, tells stories and frame experience.

Teacher Empowerment Dimensions

Reform in education system encouraged researchers to conduct studies on teacher empowerment since 1980s (Edwards, Green, & Lyons, 2002). Short, Greer and Melvin (1994) perceived empowerment as ''a process whereby school participants develop the competence to take charge of their own growth and resolve their own problems'' (p. 38). Teacher empowerment is defined as a process of encouraging teacher participation in making decisions in the school (Rice & Schneider 1994). Similarly, Short and Rinehart (1992) defined empowerment as "the opportunities an individual has for autonomy, choice, responsibility, and participation in decision making in organizations" (p. 592). According to Bolin (1989), teacher empowerment is providing teachers the rights to make decisions related to the goals and policies of the schools besides exercising their rights to curriculum choice. Keeping the focus on school reform, attention must be directed toward teacher empowerment by assigning roles and creating opportunities (Short & Rinehart, 1992).

Short and Rinehart (1992) maintained that the concept of empowerment exists on three levels: foundation level, development level, and involvement level. In the foundation level, empowerment focuses on teachers' critical thinking and problem-solving abilities to make decisions. In the development level, professional development programs are viewed as keys to developing teachers' self-efficacy and impact. Involvement level deals with the nature of teacher involvement in decision making processes geared toward creating effective schools.

Short and Rinehart's School Participant Empowerment Scale

Short and Rinehart (1992) extended the concept of teacher empowerment by empirically grounding it in education through the construction of six dimensions: (a) decision making, (b) professional growth, (c) status, (d) self- efficacy, (e) autonomy, and (f) impact. A description of each dimension is presented below.

Decision-making as one of the dimensions of empowerment, values the involvement of teachers in making decisions for the improvement of the school's effectiveness (Short, 1992; Short & Johnson, 1994; Short & Rinehart, 1992). When teachers play roles in making decisions in school, a sense of belongingness and involvement is developed (Hirsch, Emerick, Church & Fuller, 2006). Thus, involving the teachers in decision making is observed as a most important component of teacher empowerment.

Professional growth emphasizes on creating opportunities for teachers to develop their skills in the schools (Short & Johnson, 1994; Short & Rinehart, 1994). DuFour and Eaker (1998, 2008) stated that the objective of professional development program is to help teachers become more effective in helping students identify and capitalize on their strengths. Consequently, to meet the

needs of different learners, teachers should be life-long learners (Hirsch et al., 2006).

Status as a dimension of empowerment focuses on teachers' sense of support, respect, and admiration they receive from their colleagues (Short, 1994). When teachers' work is valued by their colleagues, the strength of their professional status gets solidified (Klecker & Loadman, 1998). Consequently, the amount of attention teachers receive from parents, students, community, peers, and superiors helps in developing their status (Klecker & Loadman, 1998; Short & Johnson, 1994).

Self-efficacy as a dimension of teacher empowerment is defined as improving students' performance by setting goals and pursuing it consistently (Schwarzer & Hallum, 2008). When teachers perceive their competence in enhancing student learning and build and sustain effective programs to assist students, they have high self-efficacy (Short, 1994).

Autonomy refers to "teachers' beliefs that they can control certain aspects of their work life in areas such as scheduling, curriculum, textbooks, and instructional planning, and the hallmark of autonomy is the sense of freedom to make certain decisions" (Short, 1994, p. 493).

Impact as a final dimension of empowerment focuses on teachers' influence on students' lives. Short and Johnson (1994) concur that when one perceives that their works have influences in school environment, they have greater impact. Thus, the teacher's sense of positive impact on school environment helps in boosting their self-esteem (Short & Johnson, 1994).

Principal leadership and teacher empowerment are significantly interrelated in schools' success (Murphy, 1991; Bolman & Deal, 1991; Short & Rinehart, 1992; Hirsch et al., 2006). The principals' roles have been recognized as one of the significant factors contributing to the success of the schools (Short & Rinehart, 1992). Research on effective schools reveals principal effectiveness as a key input to school reform (Barker, 1997; Murphy, 2001). Since the success of a school depends on the entire staff working in it, distributed leadership is much preferred than the traditional top-down leadership practices. Sharp (2009) suggests that principals who take the responsibilities alone and manage the reform and change from a top-down perspective are likely to create more distance between teachers and administrators, resulting in further disempowerment. Therefore, principals must empower the teachers as it helps in bringing up their self-esteem, developing their professional competency, improving staff collegiality, and enhancing motivation that finally results in higher student achievement (DuFour, 1999; Keiser &Shen, 2000). Thus, this study examined the leadership behaviors of the principals as perceived by the ESL teachers of Central Bhutan. It also assessed ESL teachers' perception of teacher empowerment prevalent in the schools of Central Bhutan.

Methods

This quantitative research approach examined leadership behaviors and teacher empowerment as perceived by the ESL teachers in Central Bhutan. In this section, discussions on research instrument, research setting and participants, data collection procedures, and data analysis techniques are provided.

Research Instruments

This quantitative study used two questionnaires to collect data. To examine principal leadership behaviors, Bolman and Deal's Leadership Orientation Questionnaire (LOQ) was used. To assess teacher empowerment, Short and Rinehart's School Participant Empowerment Scale (SPES)was used.

Leadership Orientation Questionnaire: Bolman and Deal's Leadership Orientation Questionnaire (LOQ) contains parallel versions of the instrument, one for leaders (Self) and the other for supervisors and teachers (Others). To evaluate teachers' perception of principals' leadership behaviors, current study utilized the latter (Others—ratings from teachers). Both versions have four sections representing the four frames as explained. Section one deals with leadership behaviors. Rating scales for this section range from never (1) to always (5) for leaders' behaviors.

With a total Chronbach's alpha of 0.98, LOQ measures principal leadership styles categorized as frames. After assessing the internal consistency and the subscales by computing Cronbach alphas, the reliability of the instrument for four frames was reported as: structural, .92, human resources .93, political, .91, symbolic .93. These numbers show the high inter-item reliability of the instrument.

School Participant Empowerment Scale: Short and Rinehart's (1992) SPES instrument with a 38-item was used to collect data for teacher empowerment. With a total Chronbach's alpha of 0.94, this instrument measures a broad area of empowerment identified as dimensions. The dimensions and their internal consistency estimates (coefficient alphas) are: decision-making (0.89); professional growth (0.83); status (0.86); self-efficacy(0.84); autonomy (0.81); and impact (0.82). Short and Rinehart (1992) reported that evidence of discriminant validity was established for the 38-item instrument by comparing teacher ratings from two schools that participated in a project designed to empower teachers with ratings from a school that did not employ empowerment interventions.

The 5-point rating scale of the LOQ and SPES tools had a Likert scale range of 1=strongly disagree to 5=strongly agree with the scale midpoint of '3' defined as 'neutral.' Ratings for strongly disagree were in the range between 1.00-1.99,

indicating lowest level of principal's use of leadership frames and the lowest level of teacher empowerment. Ratings for disagree were in the range between 2.00-2.99. It shows the low level of principals' use of leadership frames and low level of empowerment. Ratings for neutral or medium level of leadership behaviours under the categorized frames and teacher empowerment were in the range between 3.00-3.99. Ratings for agree were in the range between 4.00-4.99, indicating high level of principal's use of leadership frames and teacher empowerment, and 5:00 for strongly agree, representing the highest level of principals' use of leadership frames and empowerment.

Research Setting and Participants

This study was conducted in Trongsa district in Central Bhutan. There were a total of 24 schools that included 4 extended classrooms (ECR), 15 Primary schools (PS), 2 Lower Secondary Schools (LSS), 2 Middle Secondary Schools (MSS), and 2 Higher Secondary Schools (HSS). A total of 88 ESL teachers took part in this research (53 male and 35 female).

Data Collection Procedures

After receiving the approval certificate from the Mahidol University Institutional Review Board (IRB), the researcher submitted a letter to the Director General, Ministry of Education, Bhutan asking for the permission to conduct research. The researcher visited schools and distributed questionnaires directly to the ESL teacher participants after receiving the approval from the Director General, Ministry of Education and District Education Officer (DEO), Trongsa. The researcher visited schools and distributed the questionnaires directly to ESL teachers to maintain confidentiality. The participants were instructed to fill out the questionnaire.The researcher collected the completed questionnaires. The entire process of data collection lasted for one month.

Data Analysis

The descriptive statistics (mean and standard deviation) for Leadership Orientation Questionnaire (LOQ) and School Participant Empowerment Scale (SPES) were computed using the Statistical Program for the Social Science (SPSS) to examine ESL teachers' perception of principal leadership behaviours and teacher empowerment in Trongsa district, central Bhutan. Pearson correlation analysis was computed to find the relationship between the two independent variables. To examine the influence of principal leadership on teacher empowerment, regression analyses were conducted.

Results

For research question 1: What leadership styles are exhibited by the principals

in the schools of Bhutan as perceived by ESL teachers, Bolman and Deal's Leadership Orientation Framework was used to determine leadership styles teachers perceive their principals predominantly utilize.

In table 1, mean scores for teacher perception of Leadership frame ranged from M = 3.16 to 3.26, with the two highest subscales being reported as Structural frame and Political frame and the lowest as Symbolic frame (*M*=3.16, *SD*=.79). ESL teachers in general viewed their principal as operating from structural (M = 3.26) and political (M = 3.22) leadership framework subscales.

Table 1: Teachers' Perception of Leadership Frames their Principal Utilizes

Principal Leadership	*M*	*SD*	Level
Structural Frame	3.26	.77	Medium
Political Frame	3.22	.76	Medium
Human Resource Frame	3.21	.82	Medium
Symbolic Frame	3.16	.79	Medium
n=88	3.21	.79	

The overall results from the descriptive statistics on principals' use of leadership frames was neutral (*M*=3.21, *SD*=.79), indicating medium level of use of leadership orientation frames.

Finding: 2

Findings related to research question 2: To what extent do ESL teachers feel that they are empowered? Short and Rinehart's SPES was used to determine the level of empowerment among teachers. As presented in Table 2, the mean scores for teacher empowerment ranged from M = 2.69 to 3.63, Self-efficacy, Status, Impact, Autonomy, and Decision making, respectively.

Table 2: Teachers' perception of Teacher Empowerment

Six Dimensions of Teacher Empowerment	*M*	*SD*	*Level*
Self-efficacy	3.63	.78	Medium
Status	3.53	.71	Medium
Impact	3.18	.93	Medium
Professional growth	3.15	.93	Medium
Autonomy	2.88	.98	Low
Decision making	2.69	.95	Low
Total	3.14	.95	

ESL teachers in general perceived low level of empowerment under Decision Making (M=2.69, SD=.95) and Autonomy dimensions (M=2.88, SD=.98). (*M*=3.63, *SD*=.78) while a medium level of empowerment were found in rest of the dimensions. The overall rating of the SPES was neutral (M=3.14), indicating medium level of empowerment.

Finding 3:

To find the relationship between principal leadership and teacher empowerment as perceived by ESL teachers, correlational statistics were computed. The findings in Table 3 showed that, on the whole, principal leadership correlated positively with Teacher empowerment. The correlations between the independent variables and the dependent variables are provided in Table 3. The results indicated that there were a relationship between the independent variables and the dependent variables (p<.05).

Table 3: Correlations on Principal Leadership and Teacher Empowerment

TE PL	Decision Making	Professional Growth	Status	Self-ef-ficacy	Autono-my	Impact
Structural Frame	.378**	.424**	.363**	.371**	.362**	.406**
Human- Resource Frame	.397**	.495**	.393**	.401**	.382**	.398**
Political Frame	.315**	.425**	.326**	.327**	.283**	.335**
Symbolic Frame	.359**	.414**	.317**	.318**	.298**	.351**
**. Correlation is significant at the 0.01 level (2-tailed).						

Given these correlations, regression analysis was used to further investigate the relationship between the independent and the dependent variables. Each dependent variable was regressed against the independent variables. Table 4 presents the results of the regression of Principal Leadership on Teacher empowerment in general.

Table 4: Regression of Principal Leadership on Teacher Empowerment.

Predictors	**B**	**T**	**Sig.**	**R²**
(Constant)		4.276	.000	
Teacher Empowerment	.425	4.348	.000	
F=18.905				.180

The regression result revealed that principal leadership has influence on teacher empowerment (p<001). A**s** the p-value is less than 0.05, the result suggests a significant relationship between principal leadership and teacher empowerment.

Discussion

In this section, the findings from the study are discussed in three parts: principal leadership, teacher empowerment, and influence of principal leadership on teacher empowerment.

Principal Leadership

Leadership frames can be used to define the types of leadership besides evaluating the managerial and leadership effectiveness. It is evident from studies that people use different views to comprehend human behavior in organizations (Lezotte, 1992; Sizer, 1992). Bolman and Deal's (1991) research in Florida and Singapore revealed that all four frames were associated with leaders' effectiveness. The structural frame was the strongest predictor of managerial effectiveness in both groups of administrators, while the symbolic frame stood strong for leadership effectiveness. The result conveys that leaders using multiple leadership frames have greater impact on schools' effectiveness.

Thompson (2000) examined gender and use of leadership frames among lower, middle, and upper managers and found leaders who use multiple frames to be more effective in their leadership responsibilities. The study revealed that the balanced leadership, in other words, use of two or more frames produced both effective managers and leaders.

The current study revealed medium level of use of leadership frames by the principals in the schools under Trongsa District in Central Bhutan. ESL teachers in general viewed their principal as operating from structural and political leadership framework subscales. Even the highest rated structural frame indicated a medium level of use of structural frame leadership styles.

These results support the earlier findings made by iDiscovery Education and REC (2009) that, principal recruitment criteria are ineffective in drawing out competent and qualified principals. The evidence of a need for effective principal recruitment criteria is observed in the National Education Framework (REC, 2012) that "Principals are drawn from the same cohort as teachers and do not undergo rigorous standards for selection" (p. 44). As a result of ineffective recruitment criteria, most of the principals fail to exhibit instructional leadership qualities as they lack "specialized ability to observe and coach teachers, make curricular improvements and model effective practice" (REC, 2008). Thus, with limited knowledge on leadership skills and incompetent professional status, the results revealed principals' limited use of leadership orientation framework. For effective school reform to take place, the principals must employ a wide range of leadership skills and strategies. The use of leadership frames depending on the situations might help principals to develop effective leadership and managerial skills required for building effective schools.

Teacher Empowerment

The findings of this study on teacher empowerment support previous researches. Wall and Rinehart (1998) found that the teachers experienced high level of empowerment in the status dimension. Decision making was rated the lowest, indicating their low level of empowerment in making decisions in the schools. Similar results were found by Klecker and Loadman (1998) from their study to measure dimensions of teacher empowerment in 169 Ohio public elementary schools. Teachers' sense of empowerment was high in professional growth dimension followed by self-efficacy, status, and impact. Low level of empowerment was found in autonomy and decision making dimensions. Bogler and Somech's (2005) study conducted in Israeli middle and high schools revealed similar results: status (M = 4.1, SD= 0.62), professional growth, impact, self-efficacy, autonomy and decision making (M=3.1, SD= 0.73).

In the present study, similar results were found: self-efficacy (M=3.63, SD=.78), status, impact, professional growth, autonomy, and decision making (M=2.15, SD=.95)(see Table 2). These findings imply that teachers feel that they are performing their professional duties well (self-efficacy), they have respect (status), and they are effective at their job (impact). However, the results from all these studies (Bogler & Somech, 2005; Klecker & Loadman, 1998; Wall & Rinehart, 1998) revealed that teachers were not involved in schools' decision-making processes.

When decision making is considered as the important component of teacher empowerment, it is surprising to note the least mean rating on this dimension, representing low level of empowerment (M=2.69, SD=.95) as presented in Table 2. The interpretation of these scores simply means that the teachers in the 24 schools of Trongsa district in Central Bhutan were least involved in making decisions in the school. Teachers in this study reported that they were less involved in decisions related to school operation and administration, such as setting school goals, allocating budget, and evaluating teachers. Therefore, principals need to adopt differentleadership and managerial strategies that emphasizes the importance of involving teachers in decision making related to managerial and instructional domains.

In addition, the second lowest rated dimension "Autonomy" reveals low level of empowerment in decision making. Short (1991, p. 11) defined autonomy as, "...the teachers' sense of freedom to make certain decisions that control certain aspects of their work life. These aspects may be scheduling, curriculum, textbooks, and instructional planning..." These scores represented the lack of freedom and opportunities for the ESL teachers in the schools to take control over their daily schedule and choose how they approach curriculum and classroom instruction. Effective school reform would take place if teachers have control over the time, curriculum, teaching pedagogies and approaches

(Dorji & Soranastaporn, 2015).

Principal Leadership and Teacher Empowerment

Sharp's (2009) quantitative research on the relationship between teacher empowerment and principal effectiveness shows teachers' perceptions of empowerment and principal effectiveness. The study revealed significant correlations between the domains of organizational development, organizational environment, educational program, and the subscale of professional growth.

In addition, Ellis' (2012) exploratory mixed-method study revealed principals' characteristics, strategies, and behaviors significantly affecting teachers' feelings, thinking, and behaviors and their perceptions of empowerment across six dimensions of empowerment. The findings of this study accentuated on appreciating teacher voice and input through distributed leadership and collaboration that contribute to teachers' sense of empowerment.

On the other hand, Leech and Fulton (2008) examined levels of high school teacher participation through shared decision making with their principals. The results indicated a weak correlation between principal leadership practices and the level of shared decision making in the secondary schools. The relationship between leadership practice of challenging the process and the level of shared decision making in the development of policy was found the weakest. The teachers perceived their level of contributions in the area of policy development as higher when the principal exhibited greater risk-taking behavior.

In this study, no significantly strong correlations were established between principal leadership and teacher empowerment. Thus, regression analysis was performed to check whether principal leadership influences teacher empowerment. The results revealed that principal leadership has influence on teacher empowerment.

Implication and Limitation

The study revealed principals' medium level of use of leadership orientation framework and teacher empowerment. For effective school reform to take place, the Ministry of Education (MoE), curriculum developers, principals, teacher educators, and classroom teachers should acknowledge these findings.

Research findings suggest that principal recruitment criteria are ineffective in drawing out competent and qualified principals (iDiscoveri Education & Royal Education Council). The evidence of a need for effective principal recruitment criteria is observed in the National Education Framework (REC, 2012) that principals are recruited from teachers who did not undergo trainings in leadership and school management. The MoE should devise effective principal recruitment criteria to recruit principals, provide trainings on management and leadership, and motivate principals to upgrade their professional status. In addition, the MoE

should encourage teacher participation in productive seminars and activities to enhance teachers' professional growth and self-efficacy, rather than involving them in cost saving, one-size fits-all programs.

Similarly, the curriculum developers must consult teachers to influence, design, and create the curriculum collaboratively. To encourage teacher participation in shared decision making, teacher educators should help them build social and professional skills required in decision making processes. Likewise, teacher training colleges shoulddesign curriculum for the teachers that incorporates basic skills in leadership and management of the school.

The principals' characteristics, strategies, and behaviors positively impacted teachers' sense of empowerment as demonstrated through this study. Since most of the principals failed to exhibit instructional leadership qualities as they lack specialized skill to help teachers, make changes in curriculum, and exhibit good practices, (iDiscoveri Education & REC, 2009), principals should pursue trainings on leadership and management. Similarly, principals' knowledge on leadership frames and practices would strengthen teacher's sense of empowerment. Thus, the principals should read books on management and leadership skills and strategies to increase their knowledge to lead the school effectively. Furthermore, they should participate in seminars and workshops related to effective school reforms.

Patterson, Purkey, and Parker (1986) pointed out that the "principal is not, in fact, the only person who can provide leadership, especially leadership for school improvement" (p. 103). Therefore, the practice of decentralized governance and shared decision-making must be encouraged or inculcated. The principals need to create avenues to involve teachers in making decisions in all aspects of school activities.

The presence of teacher empowerment in the schools would be futile if it fails to advance students' benefit and educational betterment (Conway & Calzi, 1995). Classroom teachers should be conscious of their central position as educators and keep improving and updating their knowledge by developing collaborative working atmosphere.

Lastly, this quantitative study revealed principal leadership styles and teacher empowerment as perceived by ESL teachers of central Bhutan. Generalizing the findings to rest of the schools in Bhutan might not be appropriate. In future, the mixed-method research, inclusive of the information like relation between gender, age, teachers' education background, and teaching experience would expand the findings that might be more generalizable.

Conclusion

This quantitative research approach examined principal leadership behaviors and teacher empowerment as perceived by ESL teachers of Trongsa district

in Central Bhutan.The results revealed principals' medium level of use of leadership orientation framework and teacher empowerment. No significantly strong correlations were established between principal leadership and teacher empowerment, although the regression analysis revealed the influence of principal leadership on teacher empowerment. Principals need to adopt different leadership and managerial strategies that emphasizes the importance of decentralized governance through teacher involvement in decision making related to managerial and instructional domains. Bolman and Deal's leadership frames help principals conceptualize different leadership approaches. Therefore, principals should use two or more frames depending on the circumstances as an approach to developing successful school. In addition, teachers are key and central for any effective school reform initiatives to take place.

References

Barker, J. A. (1997). How can we train leaders if we do not know what leadership is?*Human Relations Journal*, *50*(4), 343-362.

Bass, B.M. (1996). *A new paradigm of leadership: An inquiry into transformational leadership.* Alexandria, VA: US Army Research Institute for the Behavioral and Social Sciences.

Bass, B. M., & Avolio, B. J. (1993). Transformational leadership: A response to critiques. In M. M. Chemers & R. Ayman (Eds.), *Leadership theory and research: Perspectives and directions* (pp. 49-80). San Diego: Academic Press.

Bogler, R., & Somech, A. (2005). Organizational citizenship behavior in school: How does it relate to participation in decision making? *Educational Administration*, *43*(5), 420-438.

Bolin, F.S. (1989). Empowering leadership. *Teacher College Record,91*, 81-96

Bolman, L., & Deal, T. (1991). *Reframing organizations: Artistry, choice, and leadership*. San Francisco: Jossey-Bass.

Conway, J., A. & Calzi, F. (1995).The dark side of shared decision making. *Educational Leadership, 53* (4), 45-49.

Darling-Hammond, L., LaPointe, M., Meyerson, D., Orr. M. T., & Cohen, C. (2007). *Preparing school leaders for a changing world: Lessons from exemplary leadership development programs*. Stanford, CA: Stanford University, Stanford Educational Leadership Institute.

Dorji, P. & Soranastaporn, S. (2015). A study of teacher empowerment as perceived by ESL teachers in central Bhutan.*The 6th National Graduate Conference* (NGC 1-2015). Kasetsart University, Thailand

DuFour, R., DuFour, R., & Eaker, R. (2008). *Revisiting professional learning communities at work*: *New insights for improving schools.* Bloomington,

IN: Solution Tree.

DuFour, R., & Eaker, R. (1998). *Professional learning communities at work: Best practices for enhancing student achievement.* Bloomington, IN: National Education Service; ASCD

Edwards, J. L., Green, K. E., & Lyons, C. A. (2002). Personal empowerment, efficacy, and environmental characteristics.*Educational Administration*, *40*(1), 67–86.

Fullan, M.(1991). *The new meaning of educational change.*Teachers' College Press, New York.

Frymier, J. (1987). Bureaucracy and the neutering of teachers. *Phi Delta Kappan, 69*, 9-14.

Hallinger, P., & Murphy, J. (1985). Assessing the instructional leadership behavior of principals. *Elementary School Journal*, *86*(2), 217-248.

Hargreaves, A. (1994). *Changing teachers, changing times: Teachers'work and culture in the postmodern age.* London: Cassells and New York: Teachers' College Press, Toronto: University of Toronto Press.

Hirsch, E., Emerick, S., Church, K., & Fuller, E. (2006). *Arizona teacher working conditions: Designing schools for educator and student success.* Retrieved September 11, 2014, from Center for Teaching Quality website: http://www. teachingquality.org.

Hassel, E. (1999).*Professional development: Learning from the best.* Oak Brook, IL: North Central Regional Educational Laboratory (NCREL).

iDiscoveri Education & Royal Education Council (2008). *The quality of school education in Bhutan: Reality and opportunities.*REC, Thimphu, Bhutan.

Klecker, B., & Loadman, W. E. (1996). *An analysis of the school participant empowerment scale based on data from 4,091 teachers in 183 restructuring schools.* Paper presented at the annual meeting of the American Educational Research Association, New York, NY.

Klecker, B. J. & Loadman, W.E. (1998a). Defining and measuring the dimensions of teacher empowerment in restructuring public schools. *Education*, *118*(3), 358-405.

Kurtz, S. (2009).Teacher leadership, *Leadership, 39*(1), 12-14.*ProQuest Education Journals* Retrieved August 11, 2014, from http://www. psycholosphere.com/Teacher%20Leadership%20by%20Kurtz.pdf

LaPrairie, M. (2013). *A case study of English-medium education in Bhutan.* Unpublished PhD dissertation in Educational Leadership. Institute of Education, University of London.

Lintner, J., D. (2007). *The relationship between perceived teacher empowerment and principal use of power.*Unpublished PhD dissertation in Educational Leadership, Auburn University.

Patterson, J. L., Purkey, S.C., & Parker, J.V. (1986). *Productive school systems*

for a non-rational world. Alexandria, VA: Association for Supervision and Curriculum Development.

Rice, E. M., & Schneider, G. T. (1994). A decade of teacher empowerment: An empirical analysis of teacher involvement in decision making, 1980-1991. *Journal of Educational Administration*, *32*(1), 43-58.

Royal Education Council. (2012). *National education framework (NEF): Shaping Bhutan's future*. Thimphu: Royal Education Council.

Royal Government of Bhutan (2014).*Annual education statistics,* Policy and Planning Division, Ministry of Education. MoE, Thimphu, Bhutan.

Royal Government of Bhutan (2008). *Education without Compromise,* Education Sector Review Commission, Bhutan. RGoB, Thimphu, Bhutan.

Royal University of Bhutan (2007). *Royal University of Bhutan strategic plan 2004-2012.* Thimphu, Bhutan: Royal University of Bhutan.

Schwarzer, R., & Hallum, S. (2008). Perceived teacher self-efficacy as a predictor of job stress and burnout: Mediation analyses. *Journal of Applied Psychology*, *57*(1), 152-171.

Sharp, D. C. (2009). A study of the relationship between teacher empowerment and principal effectiveness. Retrieved from http://files.eric.ed.gov/fulltext/ED368701.pdf

Shelton, S. (2011). *Strong leaders, strong schools: 2010 school leadership laws.* Washington, D.C.: National Conference of State Legislatures.

Short, P. (1992).Dimensions of Teacher Empowerment. *ERIC, N/A* (ED368701). Retrieved from http://files.eric.ed.gov/fulltext/ED368701.pdf.

Short, P. M., Greer, J. T., & Melvin, W. M. (1994). Creating empowered schools: Lessons in change. *Journal of Educational Research*, *32*(4), 38–52.

Short, P. M., & Johnson, P. E. (1994). Exploring the links among teacher empowerment, leader power, and conflict. *Journal of Education*, *114*(4), 581-593.

Short, P. M., & Rinehart, J. S. (1992). School participant empowerment scale: Assessment of level of empowerment within the school environment. *Educational and Psychological Measurement*, *52*(6), 951–960.

Smylie, M. A. (1996). From bureaucratic control to building human capital: The importance of teacher learning in education reform. *Journal of Educational Research*, *25*(9), 9-11.

Thornburg, D., & Mungai, A. (2011). Teacher empowerment and school reform. *Ethnographic & Qualitative Research, 5*(4), 205-217.

Wall, R., & Rinehart, J. S. (1998).School-based decision making and the empowerment of secondary school teachers.*School Leadership, 8*(1), 49-64.

World Bank. 2009. *Findings from the Bhutan Learning Quality Survey.* Washington, DC. © World Bank. https://openknowledge.worldbank.org/handle/10986/17940 License: CC BY 3.0 IGO.

A Study of Factors Influencing Students' Academic Performance in a Higher Secondary School in Bhutan

Tshewang Rabgay[1]

Abstract

The purpose of this study was to investigate the factors affecting academic performance of the students of ahigher secondary school in Bhutan. The dependent variable considered for the study was students' academic performance, which was indicated by students' test scores and the independent variables were students' demographic characteristics, parents' socio-economic status, parenting style and students' learning and study strategy. The data were collected from 241 students of the school using two questionnaires–Learning And Study Strategy Inventory and Baumrind's Parenting Style Questionnaire. Correlation analysis, independent samples t-test and descriptive analysis were used to analyze data. The findings revealed that socio-economic factors such as parents' education, income and occupation resulted in differences in academic performance but there was no difference in students' academic performance based on students' demographic variables like gender, age and living arrangements. Of the three parenting styles, namely authoritative, authoritarian and permissive, it was found that authoritative parenting results in better academic performance.The findings also revealed that students had average level learning and study skills. Recommendations were suggested to improve students' academic performance.

Key words: Academic Performance, Socio-economic Status, Learning and Study Strategy, Parenting Style

1. Introduction

Education plays a vital role in the acquisition of knowledge and skills. It helps any society fashion and model individuals to function well in their environment. An important aspect of education is academic performance. Academic performance refers to how students deal with their studies and how they cope with or accomplish different tasks given to them by their teachers in a fixed time or academic year (Dimbisso, 2009). Academic performance in different subject areas is designated

1. Teacher, Samtse Higher Secondary School
   E-mail: tshewang48@yahoo.com

by grades, marks and scores assigned by teachers (Adediwura & Tayo, 2007). The grades and scores obtained by students represent students' scholastic standing and is also a pointer of the effectiveness of schools, indicators of quality of education, a major determinant of the wellbeing of youths in particular and the nation in general (Lewin, Wasanga & Somerset, 2011). Some researches (Ali, Norhidayah, Jusoff, Kamaruzaman, Ali, Syukriah, Mokhtar, Najah & Salamt, 2009; Boit, Njoki & Chang'ach, 2012) have found that there is a close relationship between students' academic performance and development of a nation. Students with high academic performance have been found to be more productive and contribute towards the economic growth of a country.

Academic performance is important across all levels of education in Bhutan. It is an important criterion for promotion of students from one grade to another. Secondary level education is the most crucial stage in the life of students as they make an important transition to tertiary education. Academic performance determines how successfully students make this transition (Kimani, Kara & Njagi, 2013). Students who do well in their secondary education are able to secure admission to good colleges and universities. Academic performance also decides students' job placement. Students who have high academic scores in their tertiary education have more opportunities to choose their future jobs and get paid a higher salary. While high academic performance has numerous positive impacts, poor academic performance could have unfortunate consequences for students, teachers and society at large. According to Kimani et al. (2013) poor academic performance at secondary school undermines students' chances of joining institutions of higher learning and jeopardizes opportunities for job placement, and in most cases reduces an individual's active participation in national development. It is a problem that is inimical to the well-being of a society as it impedes the smooth actualization of the purpose of education, which is to mentally prepare an individual for service to self and to the society (Adeyemi&Adeyemi, 2014). Further, Liem, Dillon and Gore (2001) claim that students who have poor academic records would find it difficult to cope in a competitive society.

The higher secondary school from which data were obtained for the study is located in one of the southern districts in Bhutan. It has 593 students with classes ranging from nine to twelve. The school's vision is to be a 'model institution of excellence in the delivery of quality education. The school's goal is to 'prepare academically competent individuals' (School policy document, 2015). However, the academic performance of students of the school has come under the spotlight for a number of reasons. Over the past few years there has been an underachievement in students' academic performance in both home (standardized test conducted in school) and board examinations. Teachers in the school perceive of students' low academic performance as their being poorly

motivated andself-regulated.

Students' underachievement in academic performance is evident in the results of the Bhutan Council of School Examinations and Assessment's(BCSEA) Pupil Performance Report (PPR) in the two board examinations–BCSE (Bhutan Certificate for Secondary Education) for class ten and BHSEC (Bhutan Higher Secondary Examination and Certificate) for class twelve. The PPR reported theschool's low academic scores in both BCSE and BHSEC for four consecutive years(see Table 1). In 2011, the mean score for BCSE was 46.48 and 50.3 for BHSEC. In 2012 the mean score for BCSE was 48.2 and for BHSEC it was 49.4. In 2013mean score for BCSE was 46.5 and 50.3 for BHSEC. The year 2014 saw not much improvement. The mean score for BCSE was 52.25 and 57.5 for BHSEC. The reports also mentioned that the number of students who qualified for class eleven was just82 out of 224 in 2011, 81 out of 182 in 2012 and 82 out of 224 in 2013.

Table 1: Mean score for BCSE and BHSEC, SHSS (2011-2014)

Year	BCSE			BHSEC	
	Total Stds. Appeared	No. ofStds. Qualified for cl. XI	Mean Score	Total Stds. Appeared	Mean Score
2011	224	82 (37%)	46.5	76	50.3
2012	182	81 (45%)	48.2	77	49.4
2013	224	82 (37%)	46.5	75	50.3
2014	191	92 (48.2 %)	52.3	79	57.5

The low academic performance was not only in the board examinations but also in the home examinations. In the home exams, the average test score for class nine in 2011 was 51.3 and 56.8 in 2012, 54.3 in 2013 and 52.9 in 2014. For class eleven it was 58.7 in 2011, 59.9 in 2012, 57.2 in 2013 and 59.9 in 2014 as shown in the following table.

Table 2: Mean Score in Home Exams, SHSS (2011-2014)

Year	Class IX		Class XI	
	No. of Students	Mean Score	No. of Students	Mean Score
2011	237	51.3	94	58.7
2012	245	56.8	90	59.9
2013	206	54.3	97	57.2
2014	217	52.9	81	59.9

It is clear that in both board and home examinations the mean score has not crossed 60, indicating low academicachievement. Anecdotally it has been noted that low academic achievement is prevalent across all grades in the school. This is a pressing issue for all who have a stake in education. The issue of poor performance was discussed in several teachers', as well as parent-teachers' meetings. The results werealso discussed at the school's top management body, -the School Management Body (SMB), which comprises of heads of different agencies and institutions (SMB minutes, 2014). In both staff and SMB meetings several factors, such as students' demographic characteristics, students' poor learning and study skills, students' low level of motivation and poor parenting were speculated to be the causes of low academic performance in the school (Teachers Meeting Minutes, 2013 & SMB Meeting Minutes, 2014). Another factor considered to be significantly affecting students' academic performance was living arrangements (SMB Meeting Minutes, 2014). The school found many students staying in rented houses, all by themselves (Self catering students). These students have been placed in the school selected for the study, after completing their lower secondary education from their village school. Since they did not have relatives in the new place, they were accommodated inrented houses. These students who lacked parental guidance were deemed to perform poorly in academics compared to students staying with parents and guardians.

All in all, the fore going speculationsfrom various stakeholders triggered a need to conduct a study to understand the factors affecting students' academic performance. The purpose of this study was to identify and analyze the factors that influence academic performance in the higher secondary school from which data werecollected. The study sought to determine whetherstudents' demographic characteristics, parents' socio-economic status and parenting styles could be considered as predictors of students' academic performance in the school. The study also sought to find students' level of awareness of learning and study strategy.

Research Questions

1. Do students' demographic characteristics like gender, age and living arrangements affect students' academic performance?
2. Does parents' socio-economic status affect students' academic performance?
3. Do different parenting styles bring about differences instudents' academic performance?
4. To what extent are students aware of a proper learning and study strategy?

Significance of the Study

It is envisaged that this study may provide information for parents, educators, students and school administrators to reflect upon various factors that help

students to achieve their academic goals.

School Administrators: The results may inform the school administrators about the factors that militate against students' academic growth and accordingly adapt workable measures or strategies to improve students' academic performance.

Teachers: The results could be helpful for teachers to know the factors that influence students' academic performance and accordingly guide students to achieve their academic goals, especially in the use of learning and study strategies.

Parents: The findings of the studycan be used toinform the parents about the type of parenting style they use at home,since parents have a crucial role in children's academic growth (Bempechat, 1992). The results may stimulate parents to work towards creating and promoting conducive home environment for children's academic growth.

Students: Students may gain an insight of the weaknesses and strengths in their learning styles and study habits. It may stimulate them to work to overcome their weaknesses and consolidate their strengths.

Variables

The variables under consideration were academic performance (student's test scores) as a dependent variable and students' demographic characteristics (age, gender and living arrangements) parents' socio-economic status (parents' education, income and occupation), parenting style (authoritative, authoritarian and permissive) and students' learning and study strategy as independent variables (See Figure 1).
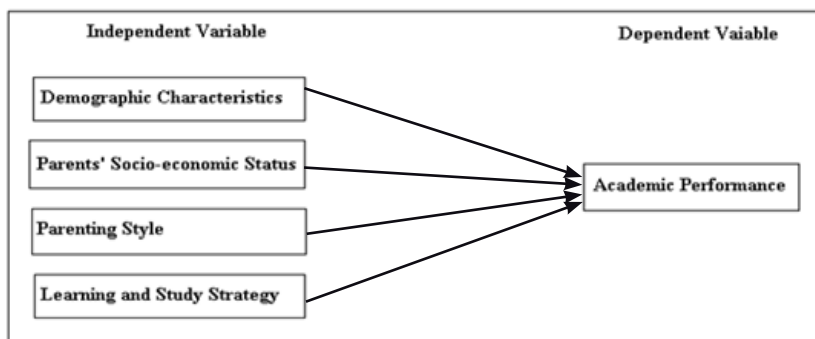
Figure 1: Dependent and Independent Variables

Limitation

The study considered to explore the effect of only four factors on students' academic performance. These factors are demographic characteristics; parents' socio-economic status; and students' study and learning style. They were chosen because of the growing speculation among teachers and other stakeholders over these factors as the causes of low academic achievement in the school. Other factors related to availability of resources, curriculum, home environment, students' locus of control, and teachers' instructional practices could not be included. The other limitation is that the study has been conducted based on data collected at only one point in time rather than collection of data at different periods of time.

2. Theoretical Framework

This section reviewed the theoretical model that guided the study followed by the review of related researches.The study is anchored in Bronfenbrenner's (2008) ecological theory, which explains multiple environmental factors like family, school, peers, neighbors, and caregivers that affect students' academic performance.

Ecological Theory

Bronfenbrenner's (2008) ecological theory suggests that a person's surroundings including their home, school, work, neighborhood, culture and government have an influence on the child's development. This theory defines complex layers of environment, each having an effect on the child's development as shown in Figure 2**.**
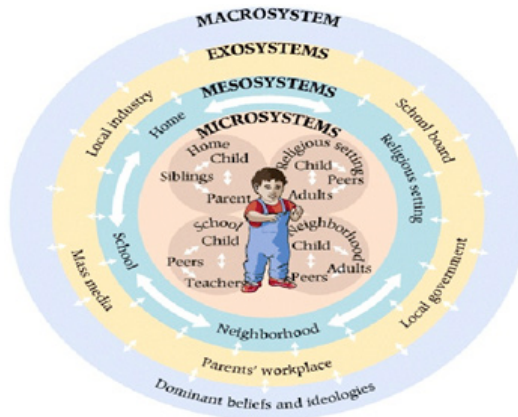
Figure 2: Child's Ecological Environment(Image: Google)

Children's ecological environment consists of the following five nested structures: microsystems, mesosystem, exosystem, macrosystem and chronosystem (Bronfenbrenner& Morris, 1998). Children's microsystems include any immediate relationships or organizations they interact with, such as their immediate family, school, peers, neighbors and caregivers (Berk, 2000). How these groups or organizations interact with the child will have an effect on how the child grows, the more encouraging and nurturing these relationships and places are, the better the child will be able to grow(Bronfenbrenner& Morris, 1998). The microsystem is the layer closest to the child and contains the structures with which the child has direct contact. The theory mentions that if the relationships in the immediate microsystem break down, the child will not have the tools to explore other parts of the environment(Bronfenbrenner, 1979).

Bronfenbrenner's next level, the mesosystem, describes how different aspects of a child's microsystem work together for the sake of the child. The next level, namely, the exosystem level includes the other people and places that the child may not interact with often but still have a large effect, such as parents' work places, extended family members and the neighbourhood(Berk, 2000). Bray, Gooskens, Khan, Moses and Seekings(2010) describe the following level, the macrosystem, as the one that involves dominant social and economic structures as well as values, beliefs and practices that influence all other social systems. The final level is termed the chrono system and involves the development of a place overtime that affects the interactions between these systems as well as their influences on the academic and intellectual development of the learners. The relevance of Bronfebrenner'stheory to the study is that it informs the researcher toconsider students' academic performance as a phenomenon that is influenced by wider social systems. By inference, the influences and experiences that result from the interactions between different social systems play a key role in determining the extent to which children perform in school. From the constructs of the ecological theory, academic performance of the pupils is inextricably linked with the characteristics of social systems. The ecological theory is, therefore, the most appropriate theory for studying the factors influencing academic performance in the school and for locating target(s) of intervention.

Factors Influencing Academic Achievement

Academic performance of students in higher education has been the subject of intensive research and the findings of four researchers (Rothstein, 2000; McMillan & Western, 2000; Jeynes, 2002)agree that the level of academic performance in school is the result of interplay of many factors like home-related factors, school-related factors, student characteristics and teacher-related factors. The study, however, was restricted tofour factors: 1) Demographic

characteristics, namely: age and gender; 2) Parents' socio-economic status, which includes level of education, income and occupation; 3) Students' study and learning style; and 4) Parenting style.These factors were chosen because of the speculation that arose from different stakeholders such as the members of SMB, teachers and parents. Each factor, as it pertains to academic achievement, is reviewed in the following sub-sections.

Demographic characteristics including age and gender and their contributory effect on students' academic performance have been studied widely. For instance, Okoh (2010) examined the influence of age and gender on academic performance of undergraduate students and found that gender and age were not significant predictors of academic performance. However, there are studies that report of a strong statistical correlation between age and gender and academic performance (e.g. Al-Mutairi, 2011). From these contrasting findings it may be concluded that the relationships between demographic features of students (such as gender and age) and their academic achievement appear to be inconsistent in different empirical studies.

Socio-economic status is one of the major factors studied while predicting academic performance. According to Jeynes (2002) and McMillan and Western (2000), socio-economic status is most commonly determined by combining parents' educational level, occupational status and income level. There is consistent evidence that these factors predict children's educational outcomes. For example, Hoff, Lauren and Tardif (2002) and Hill, Castellino, Lansford, Nowlin, Dodge, Bates and Pettit (2002) found parents education as an important predictor of students' academic performance. Escarce (2003) noted that family income has a profound influence on children's chances of educational success. King and Bellow (1989), and Ogunshola and Adewale (2012) found that there is a close relationship between parent's occupation and children's academic outcome.

Students' learning and study strategy has consistently been an important predictor of students' academic performance. The relationship between students' learning and study strategies and their academic performance is demonstrated by two recent studies. For example, Yip (2013) found that there were clear differences in the learning and study strategies used by high school students with high academic performance, compared to those with low academic performance. Michael (2013) in his study using LASSI (Learning And Study Strategy Inventory) to examine the relationship between academic performance of 260 high school students and their respective learning and study strategies, found that there were clear differences in the learning and study strategies used by high school students with high academic performance than those with low academic performance.

Maccoby (1992) stated that parenting style has a major impact on children's learning style, cognitive growth, and educational achievements. Baumrind (1967,

1973) categorized parenting style into three main categories (i.e. authoritative-warm and firm, authoritarian- firm but not warm, and permissive-warm but not firm).

Authoritative: Authoritative parenting style is characterized by an optimum balance of responsiveness and demandingness; and directing children in a rational, issue-oriented, disciplined manner by clarifying the reasoning behind rules (Baumrind, 1967). According to Baumrind (1991), authoritative parenting style is positively correlated to different developmental outcomes (e.g. academic achievement and social behaviors) of children.

Authoritarian: Authoritarian parenting style is marked by parental behaviors that are highly restrictive and very demanding (Baumrind, 1967). It is high in control and maturity demands, but low in nurturance and bi-directional communication between parents and children. Authoritarian parents constrain their children's independence and they want their children to follow strict parental rules and orders without any question by threatening severe punishment if children violate these rules and orders. Because children are groomed under a tensed emotional climate, they exhibit low self-esteem, anxiety, are resentful, frustrated and pressurized, socially withdrawn and unhappy (Baumrind, 1967, 1973).

Permissive: Permissive parents are practically the opposite of authoritarian parents. Baumrind (1989) claimed that this parenting style, at the other extreme, is characterized by non-restrictiveness and high levels of responsiveness. It is high in nurturance but low in maturity demands, supervision, and bi-directional communication between parents and children. Children have the control of everything. Parents are said to make rules, but they are inconsistently enforced even if it means failure of their children. Hence, in such a parenting climate, children are free to take up as many choices as available (with little parental guidance), even if they are incapable of being good decision makers. Under such parenting styles, the children are said to be self-centered and demanding, they lack self-discipline, are aggressive and have an inclination to clash with their authorities.

3. Methodology

This study adopted adescriptive-correlational design. According to Nwogu (2006), a descriptive survey aims at collecting data on the characteristics, features or facts about a given population. Descriptive design was considered suitable for this study because it involved the collection of data concerning the students' current status from the higher secondary school selected for the study

like age, gender, housing, learning and study strategy. Correlational design was used since the study intended to find the relationships between various factors and students' academic performance.There were 593 students in the school Random sampling of 297 participants from a total of 593 students in the school was selected using Krejcie and Morgan's (1970) sampling table (See Table 3).

Table 3: Sample Distribution (n = 297)

Classes	Male	Female	Total
IX	46	35	81
X	57	51	108
XI	36	45	81
XII	12	15	27
Total	151	146	297

Two questionnaires - Learning And Study Skill Inventory (LASSI) and Baumrind's Parenting Styles Questionnaire (BPSQ)were used to collect data.

(i) Learning And Study Skill Inventory (LASSI)

To obtain data to determine students' awareness of the use of proper learning and study strategies, Learning And Study Skill Inventory (LASSI) was used. The items in the questionnaire were rated on a five-point scale. LASSI assessed students' awareness of the ten subscales namely, Anxiety, Attitude, Concentration, Information Processing, Motivation, Selecting Main Ideas, Self -Testing, Study Aids, Test Strategies, and Time Management.

(ii) Parenting Styles Questionnaire

This questionnaire was used to obtain data on the type of parenting style used by parents. The questionnaire contained three types of parenting styles, i.e authoratative, authoritarian and permissive as categorized by Baumrind (1967).The items in the questionnaire were rated on af ive-point scale. It must be mentioned that the questionnaire was administered only to students staying with parents or guardians. It was not administered to self - catering students who were not staying with parents or guardians. Thus, in the study of parenting style variable, self - catering students were excluded.

4. Data Analysis

Data were analyzed using SPSS 16.0 and Microsoft Excel. Out of the total students (n = 297), 241 students returned the completed questionnaires. The overall response rate was 77.5%.

Gender and Academic Performance

The academic mean scores and the standard deviations for each gender are provided in Table 4. Out of the total student respondents, 132 were male and 109 were female. The academic mean score for male students was 60.8 and 61.9 for female. The difference between the academic mean scores for male and female students was 1.1. Independent samples t-test showed that there was no significant difference between the academic mean scores of male and female students (p = 0.553)

Table 4: Gender and Academic Performance

Gender	N	%		SD	Mean Difference	t-test (p value)
Male	132	54.8	60.8	13.0	1.1	0.553
Female	109	45.2	61.9	13.4		

Significance level: > 0.05 - not significant, <0.05 – significant

Age and Academic Performance

The academic mean score for each age range is presented in Table 5. Correlation analysis showed that there was a weak positive correlation between age and academic performance (0.06).

Table 5: Age and Academic Performance

Age	N	%		SD	Correlation
13-15	51	21.2	52.4	11.1	Pearson r: 0.06
16-18	124	51.5	63.2	13.9	
19-21	63	26.1	60.0	12.3	Direction: Positive
22-24	3	1.2	**71.3**	9.8	
25-27	0	0	0	0	Strength: Weak

Strength of Correlation: 1: Perfect, 0.7-0.9: Strong, 0.4-0.6: Moderate, 0.1-0.3: Weak 0: Zero

Living Arrangements and Academic Performance

The academic mean score for each living arrangement type with their standard deviations is provided in Table 6.

Table 6: Living Arrangement and Academic Performance

Living Arrangement	N	%		SD
Self - Catering	37	15.4	59.5	12.9
With Parents	139	57.7	61.2	12.7
With Guardians	65	27.0	61.8	14.1

To determine if there were significant differences between the academic mean scores of the three living arrangement types, the academic mean scores were compared using independent samples t-test. The result of the multiple comparison is represented in the form of a cross tabulation as shown in Table 7. The results of the comparisons showed no significant differences between academic mean scores of the three living arrangement types with the $p<0.05$.

Table 7:Living Arrangement and Academic Performance

	Self - Catering	With Parents	With Guardians
Self - Catering		*1.7 **0.750	*2.3 **0.522
With Parents	*1.7 **0.750		*0.6 **0.192
With Guard-ians	*2.3 **0.522	*0.6 **0.192	

*Mean difference
**Significance level: > 0.05 - not significant, <0.05 – significant

Parents' Socio-economic Status and Academic Performance

Parents' socio economic status had three components–education, income and occupation. Data analysis for each component was undertaken using correlation analysis and descriptive statistics, namely, means and percentages.

Parents' Education

Majority of the fathers (36.9%) had no formal education (See Table 8). It was noted that the number of students belonging to each education level decreased with increased levels of father's education. The highest academic mean score was for students whose father had attained a Master's Degree (77.7) and the lowest academic mean score (58.3) was for students whose fathers had a primary school level education. A moderate positive correlation was observed between father's education level and academic performance. The Pearson coefficient (r) was 0.322.

Table 8: Parents Education and Academic Performance

Education Level	Father's Education				Mother's Education			
	N	%		Correlation	N	%		Correlation
No education	89	36.9	58.8		148	61.4	60.3	
Primary education (PP-VI)	69	28.6	58.3		56	23.2	60	
Lower secondary education (VII-VIII)	14	5.8	65.3		19	7.9	66.8	
Middle secondary school (IX-X)	19	7.9	67.6	Pearson r: 0.32 Direction: Positive Strength: Moderate	8	3.3	66.3	Pearson r: 0.17 Direction: Positive Strength: Moderate
Higher secondary education (XI-XII)	15	6.2	66.2		0	0	0	
Certificate	12	5.0	66.1		5	2.1	67.4	
Diploma	15	6.2	70.5		2	0.8	64.4	
Bachelor's Degree	5	2.1	68.3		2	0.8	75.3	
Master's degree	2	0.8	**77.7**		1	0.4	68	
PhD	1	0.4	76		0	0	0	

Strength of Correlation: 1: Perfect, 0.7-0.9: Strong, 0.4-0.6: Moderate, 0.1-0.3: Weak 0: Zero

A similar trend was noted for mother's education. The number of children in a family, and hence the numbers attending school decreased with the increase in a mother's education level. The highest academic mean score (75.3) was for, children whose mother had a Bachelor's Degree. The lowest academic mean score (60) was for children with mothers who had primary schooleducation. Most mothers (61.4%) receivedno formaleducation. A moderate positive correlation was found between mother's education level and academic score with the Pearson correlation coefficient of 0.168 and significance level at 0.016.

From the analysis of the relationship between fathers' and mothers' education with academic achievement, it is clear that both fathers' and mothers' education did present as having an effect on students' academic performance.

Family Income

Majority of the students (25.3%) belonged to the family income range of

Nu.5000-10000 (see Table 9). Correlation analysis showed that there was a moderate positive correlation between family income and academic performance (0.190) indicating that those who came from higher income families achieved better exam scores than those from lower income families.

Table 9: Family Income and Academic Performance

Family Income	N	%		Correlation
No income	58	24.1	59.7	
Less than 5000	29	12	**56.0**	Pearson r: 0.190
5000-10000	61	25.3	61.7	Direction: Positive
10000-15000	39	16.2	63.0	Strength: Moderate
15000-20000	35	14.5	65.2	
More than 20000	19	7.9	**66.6**	

Strength of Correlation: 1: Perfect, 0.7-0.9: Strong, 0.4-0.6: Moderate, 0.1-0.3: Weak 0: Zero

Parents' Occupation

The details of parents' occupation and their children's academic performance are provided in Table 10. It was noted that the students whose parents were civil servants and business operators performed better than students whose parents' occupation were engaged in the military, farmers, private workers, drivers and other low wage jobs**.** The analyses of the results showed that students whose parents had a higher occupation level performed better than students whose parents were employed in lowly paid occupations.

Table 10: Parents' Occupation and Academic Performance

Father's Occupation	N	%		Correlation	Mother's Occupation	N	%		Correlation
Farmer	88	**36.5**	**57.3**		Housewife	173	**71.8**	**60.2**	
Military	34	14.1	58.2		Military	0	0	0	
Private worker, Driver, Lineman	17	7.1	58.6	Pearson r: 0.943 Direction: Positive Strength: Perfect	Private worker, Driver, Lineman	0	0	0	Pearson r: 0.976 Direction: Positive Strength: Perfect
Business	23	9.5	63.3		Business	24	10.0	62.2	
Civil servant	79	32.8	**65.5**		Civil servant	44	18.3	**66.7**	

Strength of Correlation: 1: Perfect, 0.7-0.9: Strong, 0.4-0.6: Moderate, 0.1-0.3: Weak 0: Zero

Parenting Style and Academic Performance

Table 11 showed the academic mean score and number of students for each parenting style.

Table 11: Parenting Style and Academic Performance

Parenting Style	N	%	Mean score	SD
Authoritative	52	21.6	66.1	12.6
Authoritarian	77	32	59.3	12.3
Permissive	112	46.5	58.3	15

The academic mean scores of each parenting style were compared with each other using paired samples t-test. The comparison is presented in a cross tabulation as shown in Table 12.

Table 12: Cross Tabulation (Paired Samples t-test)

	Authoritative (66.1)	Authoritarian (59.3)	Permissive (58.3)
Authoritative (66.1)		*6.8 **0.000	*7.8 **0.000
Authoritarian (59.3)	*6.8 **0.000		*1 **0.165
Permissive (58.3)	*7.8 **0.000	*1 **0.165	

*Mean difference
**Significance level: > 0.05 - not significant, <0.05 – significant

An analysis of the paired samples t-test showed that there were significant differences between the academic mean scores of authoritative and authoritarian (p = 0.000). There was also a significant difference between authoritative and permissive parenting style (p = 0.000). However, there was no significant difference between the mean academic score of authoritarian and permissive parenting style (p = 0.165). This indicated that authoritative parenting lead to better academic score than authoritarian and permissive parenting style.

Learning and Study Strategy

The means of students' rating on LASSI items constructed on a five-point scale were calculated. The overall mean was used to indicate students' opinion

about learning and study strategy.

Analysis of LASSI Subscales

The results of the LASSI analysis showed that (See Table 13), eight out of the ten LASSI components namely, attitude, motivation, concentration, Anxiety, information processing, selecting main ideas, self-testing, and study aids were average. Two components, students' use of study aids and time management were low. The overall mean was 3.0. It was clear that none of the components had a high or very high-level rating.

Table 13: LASSI Analysis

	LASSI Subscale	**x̄**	**SD**	**Level**
1	Attitude	3.3	1.2	Average
2	Motivation	3.1	1.1	Average
3	Anxiety	2.7	1.1	Average
4	Information Processing	3.7	0.9	Average
5	Selecting main ideas	2.7	1.0	Average
6	Test strategy	2.5	1.1	Low
7	Concentration	2.8	1.2	Average
8	Time management	2.5	1.1	Low
9	Self-testing	3.4	1.2	Average
10	Study aids	3.4	1.1	Average
	Overall Mean	**3.0**	**1.1**	**Average**

5. Conclusion

The conclusions drawn from the analysis were as follows.

1. There is no difference in students' academic performance based on gender.
2. There is no difference in students' academic performance based on age.
3. Living arrangements does not make any difference in students' academic performance.
4. Family income and parents' education has a moderate effect on students' academic performance.
5. Students with parents from higher occupation levels performed better than students whose parents were from low occupational levels.
6. Authoritative parenting resulted in better academic performance than authoritarian and permissive parenting.

7. Students had average level awareness on learning and study strategies.

6. Discussion

The findings from the study unveiled that parents' socio economic status including: education level; income level; occupation; and parenting style were influenced student's academic performance in the higher secondary school selected for the study. However, demographic variables like gender, age and living arrangements did not appear to influence performance. It was also found that students had average level learning and study skills.

Demographic Variables and Academic Performance

The study concluded that, although the higher secondary schoolselected for the study had students of varying age and gender (Table 4 and 5), it does not result in difference in students' academic performance. This result was consistent with the findings of Okoh (2010) who examined the influence of age and gender on academic performance of undergraduate students and found that gender and age were not significant predictors of academic performance. The result was also in line with the study conducted by Abubakar and Abubakar in (2011) where they found academic performance of Mathematics and Science students to be independent of boththe age and gender of students.

Parents Socio-Economic Factor

The study found that parents' socio-economic factors like parents' educational level, income level and occupation have a bearing on students' academic performance.The findings for each of the socio-economic variables are discussed below.

Parents' Education

The study found that students with parents who had a higher education performed better than students whose parents had low or no education. This finding supported the studies conducted by Hill et al. (2002) and Azhar et al. (2013). The reasons to account for such variation could be due to the difference in the level of assistance parents provide in their children's academic task. Azhar et al. (2013) explained that educated parents better communicate with their children regarding school work, activities and information being taught at school. They also provide higher levels of psychological support for their children through environments that encourage the development of skills necessary for success at school. On the contrary, learners whose parents are not adequately literate are disadvantaged because parents with lower levels of education may not feel capable of assisting their child or playing a role in academic life as they may

not understand the material or feel comfortable with their abilities (Hill et al., 2002). The study found that only few parents had higher education like PhD, Masters and Bachelors.

Parents' Income

It was found that students who came from high income family performed better than students who came from low income family. It was found that the majority (61%) of the parents belonged to low income range and 58% of the parents had no income. This finding was congruent with the studies of Escare (2003) and Akanle (2007) who found that children from lower income families earned lower scores in standardized tests. The possible reasons to account for such finding could be due to the low investment that low income parents make on their children's education. Akanle (2007) explained that when children are deprived of the essential learning materials it affects the psychological balance in the classroom, which causes low concentration, low perception, frustration, sickness and emotional disability in academic performance.

Parents' Occupation

Findings revealed that students of parents with higher occupation level performed better than students of parents with low occupation status. This finding was consistent with the studies of Bellow (1989), Ogunshola and Adewale (2012) who reported that students whose parents had high-ranking occupational status performed better than students whose parents had low occupational rankings. This difference in academic performance due to variance in parents' occupation could be due to the difference in the level of support provided by parents. King and Bellow (1989) claims that parents with higher occupation levels help their children set high academic goals, assist and encourage their children to be adequately involved in their academic activities and hence increase their children's chance of succeeding in academic performance. On the other hand, parents with low occupation group have low education or low income and are not able to help their children set high academic goals and provide basic resources required for education(Bellow, 1989).As presented in the previous paragraphsmost parents of the students of the higher secondary school selected for the study were farmers (36.5%) and housewives (71.8%). Therefore, it would have been difficult for most parents to provide adequate assistance to their children for academic success.

Parenting Style

The study found that there were differences in students' academic performance due to differences in parenting style. It was found that students whose parents had an authoritative parenting style had better academic

performance compared to students whose parents had an authoritarian and permissive style of parenting. This finding was congruent with studies done by Baumrind (1991), Maccoby and Martin (1983) who found that children and adolescents from the families of authoritative parents were academically more competent compared to those whose parents were non-authoritative. The reasons to account for such finding could be due to the difference in the home environments created by parents. Baumrind (1991) maintained that authoritative parenting style is a more balanced parenting style and creates a supportive home environment for children's academic and psychological development compared to authoritarian and permissive parenting styles. In authoritarian parenting style parents are highly restrictive and very demanding. Children with authoritarian parents tend to be anxious, socially withdrawn, and unhappy and perform low in academics. In permissive parenting, parents allow their children to have free control of their behaviors and actions and do not have clear rules and expectations for high achievement which result in low academic and psychological growth (Baumrind, 1971). Therefore, the difference in parenting styles and home environment resulted in differences in the students' academic performance.

Students' Learning and Study Strategy

The fourth objective was to determine the level of students' learning and study strategy using LASSI assessment tool. The levels of the ten LASSI subscales were determined using the mean. Eight out of ten components were average and two were low indicating an average learning and study strategy.

The first subscale 'Attitude' was found to be average (3.3) indicating that most students had average level attitudes and interests in school and achieving academic success. For the second subscale 'Motivation' it was found that students had average (3.1) level motivation indicating average level diligence, self-discipline, and willingness to exert the effort necessary to successfully complete academic requirements. The third subscale 'Anxiety' was average (2.7) indicating that students had average ability to manage anxiety while performing academic tasks. The mean of the fourth subscale 'Information processing' was average (3.7) indicating that students had average level use of imagery, verbal elaboration, organization strategies, and reasoning skills as learning strategies to help learn new information and skills and to build bridges between what they already know and what they are trying to learn and remember. The fifth subscale 'Selecting main ideas' was also average (2.7) which indicated that students had an average ability to recognize important course content while studying for tests. The sixth subscale 'Test Strategy' was found to be low (2.5). It implied that students had poor use of both test preparation and test taking strategies. The seventh subscale 'Concentration' was average (2.8) indicating that students' had average abilities to focus on assignments and academic work. The eighth

category 'Time Management' was low (2.5) indicating that students had poor understanding of how to develop study schedules and manage their time wisely. The ninth subscale 'Self Testing' was average (3.4) indicating that students had an average level use of reviewing and comprehension monitoring techniques to determine their level of understanding of the information or task to be learned. The last subscale 'Study aids' was found to be average (3.4). It indicated that students had an average level use of support techniques, materials or resources to help them learn and remember new information.

By and large, the result of the analysis of LASSI assessment tool showed that students had an average learning and study strategy. Study (e.g. Garg, 2011 & Yip, 2013) habits have a significant effect on academic achievements and it is essential to consider and plan to improve the study habits of students. According to Mashayekhi et al. (2014) study habits are teachable and learnable and several steps can be taken in this field.

7. Recommendations

In the light of the findings of the present study, the following recommendations are made for the improvement of students' academic performance.

First**,** the study recommends teachers, educationists and leaders to conduct educative programmes for parentsto train them on parenting skills. Since, literature and the findings both suggested authoritative parenting style as having a positive impact on students' academic achievement, the study recommends to train parents on adopting authoritative parenting styles.

Second, the study recommends for the teachers, counselors and educated parents that a course on learning and study strategies be conducted for students emphasizing the effective use of time, making a timetable, critical reading and developing test strategies. Guidance services have significant effects on the students' study attitude, study habits and academic achievement. The school guidance and counseling services may focus on study habits so that students may identify their strengths and weaknesses in the learning strategies with the intention that they may become more conscious about better study habits.

Third, the study recommends an awareness programme to encourage parents to upgrade their academic qualification through adult education programmes so that they will be in a better position to help their children with academic tasks and encourage their children to perform well.

Fourth, the study recommends students to increase their personal effort. Of the many factors influencing academic performance, student's personal inputs to learning are recognized as among the most critical (Cybinski & Forster, 2009). The studyrecommends students to be self-regulated, self-disciplined, goal-directed, use time wisely, assume personal responsibility for contributing to their own learning; be willing to put effort into their studies; participate actively

in class, do their tasks diligently, consult their teachers, follow a time table and have positive attitude towards schooling and learning.

Fifth, as informed by the ecological theory, students' academic performance is a result of the interplay of various social elements around a child. It is important that teachers, parents, educationists, counselors, neighbours and friends cooperate and play their roles adequately in creating conducive learning environments at school and at home to improve students' academic performance. The onus of improving students' academic performance should not be kept to one stakeholder alone.

REFERENCES

Adediwura, A. A. & Tayo, T. (2007). Perceptions of teacher knowledge, attitude and teaching skills as predictor of academic performance in Nigerian secondary schools. *Educational Research and Review*, 2(7), 165-171.

Adeyemi, A.M. & Adeyemi, S.B. (2014). Institutional factors as predictors of students' academic achievement in colleges of education in south western Nigeria. *International Journal of Educational Administration and Policy Studies*, 6, 141-153.

Akanle, O.B. (2007). Socio-economic factors influencing student's academic performance in Nigeria. Free Online Library.

Ali, Norhidayah, Jusoff, Kamaruzaman, Ali, Syukriah, Mokhtar, Najah and Salamt, Azni Syafena Andin. (2009). The factors influencing students' performance at University Technology MARA Kedah, Malaysia'.*Canadian Research & Development Center of Sciences and Cultures*, 3(4).

Al-Mutairi, A. (2011). Factors affecting business students' performance in Arab Open University: The Case of Kuwait. *The International Journal of Business and Management*, 6(5), 146–155.

Baumrind, D. (1967). Child care practices anteceding three patterns of pre-school behavior. *Genetic Psychology Monographs,* 75(1), 43-88.

Baumrind, D. (1973). The development of instrumental competence through socialization.In A. Pick (Ed.), Minnesota Symposium on Child Psychology.

Baumrind, D. (1989). Rearing competent children. In W. Damon (Ed.), Child development today and tomorrow. Jossey-Bass, San Francisco, pp. 349–378.

Baumrind, D. (1991). The influence of parenting style on adolescent competence and substance use. *The Journal of Early Adolescence*, 11(1), 56-95.

Bempechat, J. (1992). The role of parent involvement in children's academic achievement.*The School Community Journal*, 2, 31-41.

Berk, L.E. (2000). *Child development* (5th ed.). Boston: Allyn and Bacon.

Bhutan Council for School Examinations and Assessment (BCSEA) (2011). Pupil's Performance Report. Thimphu, Bhutan.

Bhutan Council for School Examinations and Assessment (BCSEA) (2012).

Pupil's Performance Report. Thimphu, Bhutan.

Bhutan Council for School Examinations and Assessment (BCSEA) (2013). Pupil's Performance Report. Thimphu, Bhutan.

Bhutan Council for School Examinations and Assessment (BCSEA) (2014). Pupil's Performance Report. Thimphu, Bhutan.

Boit, M., Njoki, A. &Chang'ach, J. K. (2012). The influence of examinations on the stated Curriculum goals. *American International Journal of Contemporary Research*, 2(2), 179 – 182.

Bray, R., Gooskens, L., Moses, S., & Seekings, J. (2010). Growing up in the new South Africa: Childhood and adolescence in post-apartheid Cape Town: HSRC press.

Bronfenbrenner, U. (1979). The ecology of human development: Experiments by nature and design. Harvard University Press, Cambridge, Massachusetts.

Bronfenbrenner, U. & Morris, P. A. (1998). *The ecology of developmental processes. Handbook of child psychology: Theoretical models of human development.* New York:Wiley.

Bronfenbrenner, U. (2008). *Ecology of human development*. Cambridge MA:Harvard University Press.

Cybinski, P. J. & Forster, J. (2009). *Student preparedness, effort and academic performance in a quantitative business course.* Griffith Business School: Griffith University.

Dimbisso, T. S. (2009).*Understanding female students' academic performance: An exploration of the situation in South Nations nationalities and peoples' regional state – Ethiopia*. A Research Paper Presented in Partial fulfillment of the Requirements for obtaining the degree of Masters of Arts in Development Studies, International Institute of Social Science, The Hague, The Netherlands.

Duke, N. (2000). For the rich it's richer: Print environments and experiences offered to first-grade students in very low- and very high-SES school districts. *American Educational Research Journal*, 37(2), 456–457.

Eamon, M. K. (2005). Social demographic, school, neighborhood and parenting influences on academic achievement of Latino young adolescents. *Journal of Youth and Adolescence*, 34(2), 163-175.

Escarce, J. J (2003). *Socioeconomic status and the fates of adolescents*. Retrieved from http://www.pubmedcentral.nih.gov/articlerender. fcgi?artid.

Hoff, E., Laursen, B., & Tardif, T. (2002). Socioeconomic status and parenting.In M.H.

Bornstein (Ed.), Handbook of parenting, Vol. 2: Biology and ecology of parenting (2nd ed., pp. 231-252). Mahwah, NJ: Erlbaum.

Hill, N.E., Castellino, D.R., Lansford, J.E., Nowlin, P., Dodge, K.A., Bates, J.E.,

& Pettit, G.S. (2004). Parents' academic involvement as related to school behavior, achievement, and aspirations: Demographic variations across adolescence. *Child Development,* 75, 1491-1509.

Jeynes, W. H. (2002). Examining the effects of parental absence on the academic achievement of adolescents: The challenge of controlling for family income. *Journal of family and Economic Issues*, 23(2).

Kimani, G. N., Kara, A.M., Njagi, L.W. (2013). Teacher factor influencing student's academic achievement in secondary schools in Nyandarua country, Kenya. *International Journal of Education and Research,* 1(3).

King, E.M. &Bellew, R. (1989). Gains in the education of Peruvian women, 1940 to 1980. Retrieved from http://www.wds.worldbank.org/external/default/WDSContentServer/IW3P/IB/1990/08/01/000009265_3960929165050/Rendered/PDF/multi_page.pdf

Lewin, K. M., Wasanga, P., Wanderi, E. & Somerset, A. (2011). Participation and Performance in Education in Sub-Saharan Africa with Special Reference to Kenya: Improving Policy and Practice. Create pathways to Access. Research Monograph No. 74: University of Sussex.

Liem, J. H., Dillon C.O. & Gore, S. (2001). Mental health consequences associated with dropping out of high school. Paper presented at the Annual Conference of the American Psychological Association.

Maccoby, E. E., & Martin, J. (1983). *Socialization in the context of the family: Parent child interaction. Handbook of child psychology: Socialization, personality, and social development.* New York: Wiley.

McMillan, J., & Western, J. (2000). Measurement of social-economic status of Australian higher Educationstudents.*Higher Education,* 39, 223-248.

Michael, Y.C.W. (2013). Learning strategies and their relationships to academic performance of high school students in Hong Kong. Educational Psychology: *An International Journal of Experimental Educational Psychology*, 33, 817-827.

Minnaert, A. & Janssen, P. (1992). Success and progress in higher education: A structural model of studying. *British Journal of Educational Psychology*, 62, 184-192.

Ogunshola, F.&Adewale, A. M. (2012). The effects of parental socio-economic status on academic performance of students in selected schools in Kwara State Nigeria. *International Journal of Academic Research in Business and Social Sciences*, 2 (7).

Okoh, E. E. (2010). Influence of age, financial status, and gender on academic performance among undergraduates. *Journal of Psychology*, 1, 99-103.

Rothstein, R. (2000). Finance fungibility: Investing relative impacts of investments in schools and non-school educational institutions to improve student achievement. Centre on Educational Policy Publications.

Washington, DC.

Singye, J. (2012). *Demographic and socio-economic factors associated with academic performance*. Sherubtse College, Kanglung, Bhutan

Yip, M. C. W. (2013). Learning strategies and their relationships to academic performance of high school students in Hong Kong. *Educational Psychology,* 33, 817-827.

Effects of Brain-based Learning on Physics Academic Achievement and Learning Atmosphere of the Ninth Grade Bhutanese Students

Yangzom[1]

Abstract

The purpose of this study was to investigate the effects of brain-based learning on Physics academic achievement and learning atmosphere of the ninth grade students of Sherubling Higher Secondary Schoolin Trongsa, Bhutan. The research was carried out using the pretest-posttest design. A total of 38 students (N = 160) each in the experimental and control groups were taken using stratified random sampling. Achievement test and observation forms were used to collect the data. The experiment lasted for six consecutive weeks. Descriptive statistics and independent-samples t-test were used to analyze the data. The results revealed that the experimental group after the treatment with BBL performed better than the control group. It also revealed that BBL increased the academic achievement of the students and enhanced the learning atmosphere.

Key words: Brain-based learning, learning achievement, learning atmosphere

Introduction

Physics is considered a difficult science subject (Angell, Guttersrud, Henriksen, &Isnes, 2004). The views held by teachers and students on physics being a difficult subject lies in the difficulties in experiments, formulas and calculations, graphs, and conceptual explanations of the subject (Angell et al. 2004). Moreover, the requirement to make transformations like graphical illustrations to mathematical representations are viewed as troublesome (Redish, 1994). Tenzin, Johnson, Childs and Ramhandran (2008) observed that teaching science subjects in the higher classes using conventional method lacked activities and student participation. Brain-based learning (BBL) was found to support student-centered learning as many studies found that BBL increased the academic achievement of the students (Caine, Caine, McClintic, & Klimek, 2005; Erlauer, 2003; Jensen, 2005; Slavkin, 2004; Wagmeister&Shifrin; 2000).

1. Teacher, Sherubling Higher Secondary School, Trongsa
   E-mail: yangdzo@gmail.com

Thus, this study was conducted to find the effects of BBL on physics academic achievement and learning atmosphere of the ninth grade students in Bhutan.

Theoretical Background of Brain-based Learning

Learning is a complex process and even more complex is the way individuals learn (Jones & Mooney, 1981). It will not be wise to say one learner is more intelligent than the other simply by comparing the grades, a concept which teachers have long taken for granted (Cassidy & Eachus, 2000). Bowen (2011) observes that teachers are often faced with the confusion of choosing teaching strategies to bring out the best in learners. With such challenges, every educator should be prepared to be responsible for the learners' optimum level of achievement by resorting to different kinds of teaching skills and methods. BBL emerged as an answer to such confusion. With BBL, every individual is taken care of. It caters to many components which are known to maximize and enrich learning namely, "hands-on discovery, cooperative learning, integrating curriculum to build connections, creating a safe, comfortable learning environment and encouraging students to construct knowledge rather than memorize facts" (McNamee, 2011, p. 13).

Mary and Shefali (2012) describe BBL as a process of simplifying difficult lessons to make learning meaningful and cooperative. Greenleaf (2003 as cited in Duman, 2006) defines BBL as the brain's natural way of learning (p. 17). It includes accommodating the rules of brain processing and organising the teaching for meaningful learning (Awolola, 2011). These rules of the brain are made accessible to the educators through the ever-advancing field of neuroscience in the form of adaptable principles (Ozden & Gultekin, 2008). Educators incorporate these findings from neuroscience and integrate the knowledge of how the brain processes to the way different individuals learn. Sousa (2011), in his book, "How the Brain Learns" provides priceless information on how the findings from neuroscience can be incorporated into everyday classroom teaching. BBL caters to individual learning styles and needs; therefore it caters to the concept of learner-centered education (Awolola, 2011) which is the focus of education in the modern world. The BBL is incorporated into the field of education mainly through the works of Caine and Caine (1991) in the form of 12 principles (see Figure 1).
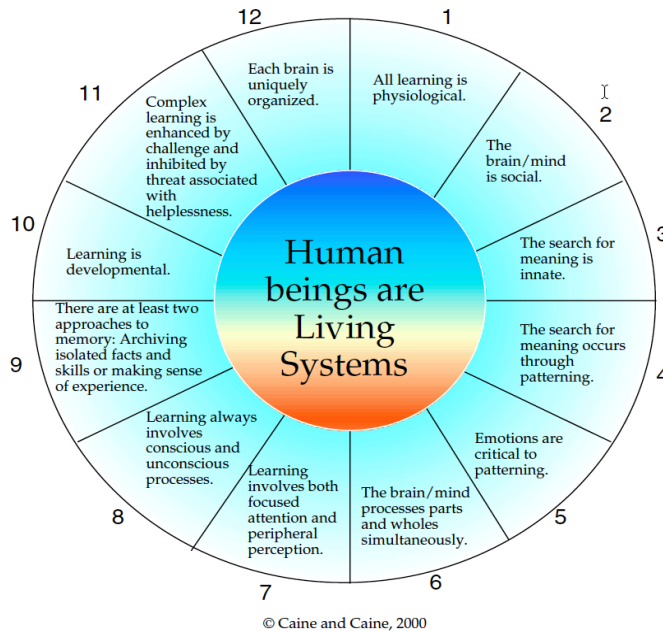
Figure 1. The 12 principles of BBL (Caine & Caine, 2000).

The principles of Brain-based Learning

The 12 principles of BBL are used to organise the lessons and the learning environment (Caine & Caine, 1991). Since teachers have the knowledge of how the brain learns naturally, they also know up to a certain level that the students are human with emotions. This knowledge helps them to manage and supervise the learning atmosphere which is the most vital of the learning components. Perrin (2012) notes that "[t]he 12 principles of brain-based learning are an avenue for teachers to connect theory to practice and begin to bridge the gap between the art and science of teaching" (p. 17). Caine and Caine's (2000) 12 principles are cited as a model of brain-based theories when it comes to the application of neuroscience in education. These principles integrate neuroscience and education (Wachob, 2012, p. 17). Its many benefits impacting the daily classroom teaching can be taken care if the teacher simply incorporates some of these principles. Not all principles need to be incorporated at once in a single lesson.

Many studies conducted in teaching and learning incorporating the 12 principles found that students became motivated during and after the lessons (Jensen, 2005; Slavkin, 2004; Wagmeister & Shifrin, 2000). Since motivation in learning comes from different factors such as the lesson itself, friends, peers' and teachers' constructive feedback, by a sense of achievement and the

students' "preferred" environment (Reid, 2007, pp. 15-17), the principles of BBL successfully addresses these factors so as to motivate the learners. Extrinsic motivation is necessary for intrinsic motivation, and it is motivation that keeps the learners on track even if they are down at times.

Related Studies on BBL

Akyurek and Afacan (2013) conducted a study on the Effects of BBL approach on students' motivation and attitude levels in science class using pre/post-test control group design. They found that the students in the experimental group had significantly higher scores in the post-test on their motivation towards the use of BBL when compared to those in the control group. Therefore, they concluded that the use of BBL increases students' motivation towards learning.

Mary and Shefali (2012) used a quasi-experimental pre-test and post-testresearch design to study the effectiveness of BBL on academic achievement in biology, stress and study habits of VIII standard students. Their results indicated that BBL is a constructive, domain specific strategy to holistic education, and that it had the potential to stimulate optimal learning among students in very relaxed and enriched learning environments.

In another study conducted by Rehman, Malik, Hussain, Iqbal and Rauf (2012), a pre-test post-test control group research design was used to evaluate the effectiveness of BBL on secondary level students. They concluded that the students who were taught using the BBL performed better than the students taught using conventional learning methods.

Awolola (2011) used pre-test-post-test non-equivalent control group research design in a quasi-experimental setting to examine the effect of BBL strategy on students' achievement in senior secondary school mathematics in Oyo State, Nigeria .The study found that BBL was more effective in enhancing students' achievement than the conventional lecture method.

Saleh's (2011) study on the effectiveness of the BBL approach in dealing with problems of form four students' conceptual understanding of Newtonian physics used the quasi-experimental research design. The findings showed that BBL possessed a better conceptual understanding of Newtonian physics compared to students who were exposed to conventional teaching methods.

Bas (2010) conducted a research on the effects of BBL on students' achievement levels and attitudes towards English lessons. The pre/post-test control group research design was used. It was found that the use of BBL method increased the motivation and academic achievement level of students. The data collected from the research also showed that the use of BBL method helped students develop a positive attitude.

A similar study was conducted by Duman (2006) using pre-test, post-test research design with one experimental group and one control group. The purpose

of the study was to examine the effect of BBL instruction to improve students' academic achievement in Social Studies instruction. The study found that the use of BBL instruction improved the academic achievement of students as well as fostered a positive attitude in the students.

Ozden and Gultekin's (2008) study on effects of BBL in a 5th grade science course on academic achievement and retention of previously acquired knowledge obtained similar results. Their pre- and post-test control group research design revealed that BBL was more effective than the traditional teaching procedures.

From all these studies, BBL as a constructive and holistic approach to education revealed its positive impact on learners. Teaching the students using theBBL methodhelpedto maximize learning in a relaxed environment, increased students' motivation towards learning, enhanced students' achievement, and developedpositive attitude in the students. The findings also revealed BBL's potential in helping learners to understand the concepts better than the conventional teaching methods.

BBL requires students to work in groups and prepare for presentations by discussing and making their own teaching aids. On the other hand, the Bhutanese students are used to learning in a teacher-centered environment (iDiscoveri Education & REC, 2009; LaPrairie, 2013;Sharp, 2009). It involves the teacher lecturing and the students passively listening or taking down notes. There are no empirical evidences about the existence of BBL studies being conducted in Bhutan. Therefore, this study being the first to examine BBL and its effects on Physics academic achievement and learning atmosphere in Bhutan, aims to:

a. bring forward the concept of BBL in the Bhutanese teaching environment;
b. disseminate the knowledge of how the brain learns and the ways to cater instruction as per the needs of the learners; and
c. address the importance of the organization of learning environment and the need for the teachers to manage the learning atmosphere.

Methods

This experimental research approach examined the effects of BBL on Physics academic achievement and learning atmosphere of the ninth grade students of Sherubling Higher Secondary School in Trongsa, Bhutan. The discussions on research instrument, research setting and participants, data collection procedures, and data analysis techniques are provided in this section.

Population, Sample, and Sampling

The sample of the study comprised 160 participants from the four sections of grade 9 students. Stratified random sampling technique was used to select

two sections out of the four sections of ninth grade. The scores of the previous tests were used to find out the learning ability among the four sections before assigning two sections each as experimental and control group. Thirty-eight students in each experimental and control group participated in the study.

Research Instruments

The research was carried out using the pre-test-post-test design. Achievement test and observation forms were used to collect the data (Appendix A &Appendix B). These instruments were validated by a team of senior researchers and professors from Rangsit University, Thailand and Bhutan. The reliability (0.89) of the achievement test was generated using KR-20.

Data Collection Procedure

Achievement test and observation forms were used to collect data. Achievement tests for both the groups were administered before and after the experiment. The lessons in both groups were observed using an observation form. This entire data collection procedure lasted for six consecutive weeks.

Data analyses

The data collected using pre and post achievement tests and lesson observations were analysed using Statistical Package for Social Science (SPSS) software. Descriptive statistics (mean and median) were computed. The mean scores of the two groups in the achievement test and the observation forms were analysed using t-test at a p-value of 0.05.

Results

The results are presented as follows: achievement test result, comparison of achievement test of the two groups, lesson observation, Mean, Standard Deviation, and level of Opinion, and the comparison of means of the indicators for the control and the experimental groups.

Achievement test result

Table 1 showed that the pre-test mean of experimental group was 10.50 and control group was 11.68. It was noted that there was not much difference and the 2-tailed significance value was 0.06 which indicated that there was no significant difference between the pre-test means of the two groups. This indicated that the two groups had equal learning abilities in the beginning of the experiment. The post-test mean of the control group was 14.92 and that of the experimental group was 16.21. The 2-tailed significance value 0.04 indicated that the mean of the post-test of experimental group was significantly higher than the mean

of the post-test of the control group. It signifies that the use of BBL increased the academic achievement of the students.

Table 1 *Comparison of Pre-test and Post-test Results*

	Control group		Experimental group		N	2-tailed value
	Pretest	Posttest	Pretest	Posttest		
Mean	11.68	14.92	10.50	16.21		
S.D	2.4	2.89	3.05	2.64		
Mean difference	3.24		5.71		38	0.04

Comparison of achievement test results of the two groups.

The comparison of pre-test and post-test showed the increase in the means of both groups. The means of both the control group and experimental group increased from 11.68 to 14.92 and 10.50 to 16.21 respectively. Figure 1below presented the graphical representation of the comparison of achievement test results of the two groups.

Figure 1. Comparison of pre-test and post-test results

Lesson observation

Table 2 showed the results of the lesson observation in two groups. The observation was done to see if the teaching of the lessons and the design of the learning atmosphere incorporated the BBL principles.The t-test of the observation scores of the experimental and control group revealed the level of

significance at p-value 0.00. The mean of the experimental group (36.80) was higher than the mean of the control group (20.40) which showed the enhancement of the learning atmosphere after the inclusion of the BBL Method.

Table 2 *t-test Result of the Lesson Observation of the Two Groups*

Group	Mean	SD	N	Mean difference	t-value	df	p-value
Experimental	36.80	2.78	5	16.40	6.59	8	0.00
Control	20.40	4.83	5				

The means of experimental group and the control group were 36.80 and 20.40 respectively. It was significant at a p-value of 0.05 which indicated the enhancement of learning atmosphere after BBL had been used.

Mean, SD, and level of opinion of Physical and Mental atmosphere

Tables 3 and 4 showed the mean, SD and the level of opinion of each indicator of physical and mental learning atmosphere. The indicators were framed from the BBL principles.

Table 3 *Mean, SD, and Level of Opinion of Physical Atmosphere*

Physical atmosphere indicators	Experimental			Control		
	Mean	SD	Opinion	Mean	SD	Opinion
1. Teaching/learning materials are displayed in the class.	3.40	0.89	'G'	2.40	1.34	'F'
2. The classroom arrangement is appropriate for group work.	3.80	0.45	'O'	1.00	0.00	'ND'
3. Lesson includes the use of different learning materials.	3.40	0.55	'G'	2.40	0.55	'F'
4. Seating arrangement facilitates interaction.	4.00	0.00	'O'	2.40	0.55	'F'
5. Classroom arrangement facilitates free movement.	4.00	0.00	'O'	1.00	0.00	'ND'
Subtotal	3.72	0.38	'O'	1.84	0.49	'F'

In the experimental group, for the physical atmosphere, the subtotal mean was 3.72 and the standard deviation was 0.38. The level of opinion indicated 'outstanding' result. Indicators 4 and 5 had the highest mean. For the mental atmosphere, the subtotal mean was 3.68 and the standard deviation was 0.31. The level of opinion indicated 'outstanding' result. Indicators 2 and 5 had the highest mean.

Table 4 *Mean, SD, and Level of Opinion of Mental Atmosphere*

Mental atmosphere in-dicators	Experimental			Control		
	Mean	SD	Opinion	Mean	SD	Opinion
1. Concepts are related to students' experience.	3.60	0.55	'O'	2.60	0.55	'G'
2. Students can choose their own partners in carrying out the activ-ities.	4.00	0.00	'O'	1.00	0.00	'ND'
3. Students share their work with others enthu-siastically.	3.60	0.55	'O'	1.80	0.84	'F'
4. Students are comfort-able asking questions/ requesting assistance.	3.20	0.45	'G'	2.20	0.84	'F'
5. The teacher responds positively to students' questions and answers.	4.00	0.00	'O'	3.00	1.22	'G'
Subtotal	3.68	0.31	'O'	2.12	0.69	'F'

Note- Level of opinion: 0.00-1.50: Not demonstrated 'ND' 1.51-2.50: Fair 'F' 2.51-3.50: Good 'G' 3.51-4.0: Outstanding 'O'

In the control group, for the physical atmosphere, the subtotal mean was 1.84 and the standard deviation was 0.49. The level of opinion indicated 'fair' results. Indicators 1, 3 and 4 had the highest mean. For the mental atmosphere, the subtotal mean was 2.12 and the standard deviation was 0.69. The level of opinion indicated 'fair' results. Indicator 5 had the highest mean.

Discussion

The results of this study indicated that BBL increased the academic achievement of the students and enhanced the learning atmosphere which is a

key factor in learning. It supports the findings of Akyurek and Afacan (2013), Mary and Shefali (2012), Awolola (2011) and Saleh (2011). They concluded that there was a significant gain in the students' achievement level when using BBL as compared to normal teaching.

The findings (Table 1) showed that the means of pre-test (11.68) and post-test (10.50) were almost equal. However, in the post-test, the means of both the groups increased with a mean difference of 3.24 in the pre-test and 5.71 in the post-test. Students performed better in both groups but the result of the experimental group was significantly higher (p=0.04). Since the learning of Physics required a lot of practical and group works, the freedom on the part of the students to choose their own partner and working style must have enabled them to learn better.

Findings from this study suggest that BBL enhanced the overall physical and mental learning atmosphere. Students liked working with the friends they most felt comfortable with as friends seemed to offer emotional support while they worked. Nelson et al. (2006 as cited in McAteer, 2010) believe that "[t]he more a teacher creates a learning environment… [that provides] emotional support, the greater the students' attention" (p. 75).

Comparison of the means of each indicator under the physical and mental learning atmospheres in both groups showed that the learning atmosphere improved dramatically in the experimental group when compared with the control group. The result of the comparison between the two groups was significant (p = 0.01).

In the experimental group, all the indicators showed an improved level of learning atmosphere which enhanced students' learning. This is in line with Lackney and McNamee's findings. The learning atmosphere should include the physical, emotional, social and pedagogical settings (Lackney, 2007, p. 5) which are deemed necessary to make the students emotionally stable (McNamee, 2011, p. 13) for optimum learning to take place. In comparing the mean scores of the physical atmosphere, indicators 4 (There is interaction in the class) and 5 (The students are free to move during activities) had the highest mean (=4). It also clearly showed that the learning was student-centered, requiring students to work in groups. This further enhanced the learning atmosphere among the students. This is supported by the study carried out by Flook, Repetti and Ullman (2005), where they found that "social experiences play… [a vital role in] children's psychological and academic functioning" (p. 326). Indicators 1 (Teaching/learning materials are displayed in the class) and 3 (Lesson includes the use of different learning materials) had the lowest mean (=3.4). It may be because the different teaching learning materials required for the lesson could not be acquired. In general, the study revealed that students in experimental group performed better than the students in control group. This result supports

the findings of the studies conducted by Duman (2006) and Waters (2005). They found that BBL teaching enhances academic achievement.

In observing the mental atmosphere, indicators 2 (Students can choose their own partners in carrying out the activities) and 5 (The teacher responds positively to students' questions and answers) had the highest mean scores (=4). It indicates that the students had the freedom of learning. This enabled them to learn through trial and error, and allowed them to use their experience to better their learning. Indicator 4 (Students are comfortable asking questions/requesting assistance) had the lowest mean (=3.2). It may be because the teacher was new to them and it took them some time to get familiarized with the teacher or that the strategy was new to them and this may have hindered them to make effective use of it.

Implication

BBL provides new directions for educators to strive for more focused and informed teaching (Cercone, 2006). This study indicated that BBL is an effective instructional approach which takes into consideration the wholesome development of the students. The results revealed that the experimental group after the treatment with BBL performed better than the control group. It also revealed that BBL increased the academic achievement of the students and enhanced the learning atmosphere. Thus, the recommendations are discussed in relation to teachers, learning space, and resources.

As students' emotional states influence their level of academic achievement, teachers should establish a culture and environment where students feel safe, comfortable, open, and receptive to new information (Caine & Caine, 1995). They should be more mindful of the physical atmosphere and emotions of the students for effective teaching and learning to take place. The factors such as prior experiences, individual learning styles and abilities, and internal and external motivation of students should be considered. Furthermore, teachers' change in their perception of teaching and learning processes is extremely crucial to have positive impacts on students' learning (Caine & Caine, 1995). Therefore, teachers should reflect on their own mental models of their classroom scenario before they incorporate BBL strategies. It is important for teachers to examine current literature and research and reflect on their own personal practice, beliefs, and make changes to their professional practice.

Gyeltshen (2008, p. 70) states that "Teachers rarely translate theoretical aspects into practical due to physical environment of the school and other influences." As reported in the Annual Education Statistics of Bhutan (RGoB, 2014), there are schools with overcrowded classrooms as well as schools without laboratory. Since successful implementation of BBL requires spacious learning space and enough resources, the schools should provide spacious learning space and adequate resources to facilitate effective teaching and learning processes.

Limitation

The present study investigated the effects of BBL on Physics academic achievement and learning atmosphere of the ninth grade students of Sherubling Higher Secondary School in Trongsa, Bhutan. The findings are limited to the ninth grade students of the target schoolonly. Generalizing the findings to rest of the learners in the schools of Bhutan might not be appropriate.

In future, it would be interesting to use the BBL in other science subjects to see how the manipulation of the physical and the mental atmosphere impact students' academic achievement and attribute towards learning. Further research may be carried out to compare BBL with other prominent teaching strategies such as co-operative learning or inquiry methods.

Conclusion

This study investigated the effects of BBL on Physics academic achievement and learning atmosphere using the pre-test-post-test research design. The data gathered from achievement test and observation forms were analyzed using descriptive statistics and independent-samples t-test. The results revealed that the experimental group after the treatment with BBL performed better than the control group. It also revealed that BBL increased the academic achievement of the students and enhanced the learning atmosphere.Therefore, teachers should consider the physical atmosphere and emotions of the students for effective BBL to take place.

References

Akyure k, E. & Afacan, O. (2013). Effects of brain-based learning approach on students' motivation and attitudes levels in science class. *Mevlana International Journal of Education*, *3*(1), 104-119.

Angell, C., Guttersrud, O., Henriksen, E. K. &Isnes, A. (2004). Physics: Frightful, but fun, pupils' and teachers' views of physics and physics teaching. *Science Education, 88,* 683-706.

Awolola, S. A. (2012). Effect of brain-based learning strategy on students' achievement in senior secondary school mathematics in Oyo state, Nigeria. *Cypriot Journal of Educadional Sciences*, *2*, 91-106.

Bas, G. "Effects of brain-based learning on students' achievement levels and attitudes towards English lesson." Elementary Education Online, 9(2), 2010: 488-507.

Bowen, C. H. (2011). Resolving the conflict: Brain-based learning, best practices, and No Child Left Behind. Perspectives in Learning: *A Journal of the College of Education & Health Professions*, *12*(1), 4-9.

Caine, G., Caine, R.N., McClintic, C., Klimek, K. (2005). *12 brain/mind learning principles in action*. Thousand Oaks, CA: Corwin Press.

Caine, G. & Caine, R.N. (1995). Re-inventing schools through brain-based learning.

Educational Leadership, 52(7), 43-47.

Caine, R. N. & Caine, G., (1991). *Making connections: Teaching and the human brain*.

Alexandria, VA: Association for Supervision and Curriculum Development, Available at http://www.sedl.org/cgi-bin/mysql/picbib-output. cgi?searchuniqueid=31

Cassidy, S. &Eachus, P. (2000). Learning style, academic belief systems, self-report student proficiency and academic achievement in higher education. *Journal of Educational Psychology, 20*(3), 307-322.

Department of Research and Curriculum Division. (2011). *Science curriculum framework classes PP – XII*. DCRD, Ministry of Education,

Thimphu Bhutan. Available at http://www.curriculum.bt/index.php/sections/ science.html.

Duman, B. (2006). The effects of brain-based instruction to improve on students' academic achievement in social studies instruction. *International Conference on Engineering Education*, *1*,17-25.

Flook, L., Repetti, R. L., & Ullman, J. B. (2005). Classroom social experiences as predictors of academic performance. *Developmental Psychology*, *41*(2) 319-327.

Gyeltshen, M. (2008). Quality of education in Bhutan:Opinions on quality of education in Bhutan. Proceedings of National Seminar, Rinpung, December 7-10, 2008. CERD, Paro College of Education, Paro, Royal University of Bhutan.

Jensen, E. (2005). *Teaching with the brain in mind* (2nd Ed.). Alexandria, VA: ASCD.

Jones, H. G. & Mooney, R. J. (1981). An approach to conceptual difficulties in physics [Electronic version]. *Physics Education, 16,* 356-359.

Kottler, J. A., Zehm, S. J. &Kottler, E. (2005). *On being a teacher: The human dimension*. Thousand Oaks, California: Corwin Press.

Lackney, J. A. (2012). *12 Design principles based on brain-based learning research.*

Design Share. Available athttp://www.designshare.com/Research/ BrainBasedLearn98.htm

LaPrairie, M. (2013). A case study of English-medium education in Bhutan. Unpublished PhD dissertation in Educational Leadership. Institute of Education, University of London.

Mary, V. G. &Shefali, P. R. (2012). Igniting students' potential through viable instructional strategies- A roadmap for excellence in education.*Research Journal of Recent Sciences*, *1*, 368-370.

McAteer, T. C. (2010). *Connecting brain research to classroom learning: A mixed-method study on how teachers apply brain research to their instruction* (Doctoral dissertation). University of La Verne. Available at http://search.proquest.com/pqdtft/docview/858855452/13D0A77EDA048278828/1?accountid=34292

McNamee, M. (2011). *The impact of brain-based instruction on reading achievement in a second-grade classroom* (Doctoral dissertation). Walden University. Available at http://search.proquest.com/pqdtft/docview/855016993/13D0A181EF979FAB40C/1?accountid=34292

Ozden, M. & Gultekin, M. (2008). The effects of brain-based learning on academic achievement and retention of knowledge in science course. *Electronic Journal of Science Education*, *12*(1), 1-17.

Perrin, J. K. R. (2012). *A quantitative study of secondary teacher's knowledge and beliefs in the principles of brain-based learning and the impact on instructional decision making* (Doctoral dissertation). Capella University.

Redish, E. F. (1994). The implications of cognitive studies for teaching physics. American *Journal of Physics, 62* (1), 796-803.

Reid, G. (2007). *Motivating Learners in the Classroom: Ideas and Strategies*. London: Paul Chapman Publishing.

Rehman, A. U., Malik, M. A., Hussain, S., Iqbal, Z., & Rauf, M. (2012). Effectiveness of brain-based learning theory on secondary level students of urban areas. *Journal of Managerial Sciences, 6*(1), 113-122.

Royal Government of Bhutan (2014). *Annual education statistics,* Policy and Planning Division, Ministry of Education. MoE, Thimphu, Bhutan.

Saleh, S. (2011). The effectiveness of the brain-based teaching approach in generating students' learning motivation towards the subject of physics: A qualitative approach. *US-China Education Review, A* (1), 63-72.

Sharp, D. C. (2009). A study of the relationship between teacher empowerment and principal effectiveness. Retrieved from http://files.eric.ed.gov/fulltext/ED368701.pdf

Slavkin, M. (2004). *Authentic learning: How learning about the brain can shape the development of students*. Lanham, MD: Scarecrow Education.

Sousa, D. A. (2011). *How the brain learns.* California: Corwin-A Sage Company.

Tenzin, W., Johnson, D., Childs, A. & Ramachandran, K. (2008). A needs assessment of science education in Bhutan. Available at http://portal.unesco.org/geography/en/files/11198/12396892105Final_Report.pdf/Final%2BReport.pdf

Wachob, D. A. (2012). Public school teachers' knowledge, perception, and implementation of brain-based learning practices (Doctoral dissertation). Indiana University of Pennsylvania.

Wagmeister, J. & Shifrin, B. (2000). Thinking differently, learning differently. *Educational Leadership*, *58*(3), 45-48.

APPENDIX A

Independent-samples t-test of achievement test
Group Statistics

	Groups	N	Mean	Std. Deviation	Std. Error Mean
Pretest	Experimental(b-bl intervention)	38	10.5000	3.04693	.49428
	Control(Normal Intervention)	38	11.6842	2.40613	.39033
Posttest	Experimental(b-bl intervention)	38	16.2051	2.63758	.42235
	Control(Normal Intervention)	38	14.9231	2.88722	.46233

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Pretest	Equal variances assumed	1.623	.207	-1.88	74	.064	-1.18421	.62981
	Equal variances not assumed			-1.88	70.22	.064	-1.18421	.62981
Posttest	Equal variances assumed	.373	.543	2.04	74	.044	1.28205	.62620
	Equal variances not assumed			2.04	70.22	.044	1.28205	.62620

Independent-samples t-test of lesson observation

Group Statistics

	Group	N	Mean	Std. Deviation	Std. Error Mean
Scores	Experimental	5	36.8000	2.77489	1.24097
	Control	5	20.4000	4.82701	2.15870

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	t	Df	Sig. (2-tailed)	Mean Differ-ence	Std. Error Differ-ence
Scores	Equal variances assumed	2.557	.149	6.586	8	.000	16.40000	2.48998
	Equal vari-ances not assumed			6.586	6.383	.000	16.40000	2.48998

APPENDIX B
Lesson observation form

Observation Form: ……..

Class: ……………
Lesson topic: …………………………………………………………….

• •

4= Outstanding	3= Good	2= Fair	1= Not demonstrated

A. Physical atmosphere

Sl. No.	Indicators	4	3	2	1
	Teaching/learning materials are displayed in the class.				
	The classroom arrangement is appropriate for group work.				
	Lesson includes the use of different learning materials.				
	Seating arrangement facilitates interaction.				
	Classroom arrangement facilitates free move-ment.				

B.
C. Mental atmosphere

Sl. No.	Indicators	4	3	2	1
	Concepts are related to students' experience				
	Students can choose their own partners in carry-ing out the activities.				
	Students share their work with others enthusias-tically.				
	Students are comfortable asking questions/re-questing assistance.				
	The teacher responds positively to students' ques-tions and answers.				

**RABSEL – the CERD Educational Journal
Guidelines for Manuscript**

RABSEL – the CERD educational journal

The CERD *Educational Journal* is published twice a year in spring and autumn by the Centre for Educational Research and Development, Paro College of Education, Royal University of Bhutan. The Journal welcomes contributors which promote the exchange of ideas and rational discourse between practicing educators, researchers, planners, administrators, educational thinkers and practitioners, learners and policy makers from Bhutan and abroad. To this end the Journal publishes articles on empirical and theoretical studies, research reports, commentaries and scholarly reviews that attempt a systematic analysis or synthesis of educational processes and systems from different viewpoints and approaches.

Notes for Contributors

Manuscripts are considered for publication with the understanding that they are original material and have not been submitted elsewhere for publication. Submission of a paper to a professional journal is considered to be a definite indication of the author's commitment to publish in that journal. A paper submitted to this journal while it is under review by another journal is regarded as unacceptable. Submitting an already published manuscript is considered to be unethical. The author should consult the Editor if he or she has any questions to whether or not the paper is suitable for publication.

Editorial Procedures

The CERD Educational Journal is a research journal. All papers considered appropriate for this journal are reviewed anonymously by at least two outside reviewers. The review process usually takes one to two months. Papers are accepted for publication subject to nonsubstantive, stylistic editing. The Editor reserves the right to make any necessary minor changes in the papers, or request the author to do so, or reject the paper submitted. A copy of the edited paper along with the first proofs will be sent to the author for proofreading. They should be corrected and returned to the Editor within *10* days. Once the final version of the paper has been accepted, authors are requested not to make further changes to the text.

MANUSCRIPT SUBMISSION GUIDELINES:

The CERD *Educational Journal* is a multidisciplinary publication presenting research and scholarly reviews related to education. Guidelines specified herein

were prepared for the convenience of authors, reviewers and publishers.

Types of articles

Three types of manuscripts are appropriate for submission to CERD journal (a) Reports of empirical research, (b) Scholarly reviews (c) Project reports

Reports of empirical research

Reports of empirical research are descriptions of research studies. These studies must have clear and important implications for education and/or research. CERD considers research representing diverse methodologies, including group design, single-subject research, case study etc. The major criteria for publication are quality of design, implementation, and writing, as well as importance to the field.

Scholarly Review

Scholarly papers take the form of essays that represent well-developed arguments on philosophical, theoretical, or practical problems in the field of education. They are not required to adhere to an empirical research design (i.e., methods, data collection, and data analysis). Instead scholarly papers pose analytical or conceptual frameworks.

Scholarly papers should contain as many of the following as are applicable, preferably in this order: (1) objectives or purposes of the inquiry; (2) the philosophical, theoretical, or practical argument; (3) literature, sources, or evidence to support the argument/analysis; (4) conclusions and implications of the argument; and (5) significance of the argument

Project reports

These articles will be shorter and more preliminary reports about interesting educational projects (innovative courses, learning communities, etc.). Several of these reports could be published in each issue. The focus of a project report is on the progress or outcomes of an academic innovation that addresses issues in education.

PREPARATION OF MANUSCRIPT

1. The complete title of the paper, the names of the author(s), institutional affiliations, e-mails, and other identifying material should be typed on a separate sheet/the title page only to assure anonymity in the review process. The first text page of the article should have the complete title of the manuscript, but not the names of the author(s).
2. The length of manuscripts should be not more than 5000 words.

3. All manuscripts should be sent with an abstract of *150–200 words* and 4 to 5 keywords. The abstract should be placed preceding the paper.

4. Articles should be double spaced and 12-point, Times New Roman font**.** Do not use forced section, page breaks, or automatic footnotes.

5. Make sure to provide complete, APA-formatted references and text citations, making sure the two correspond exactly. Pages 207–281 of the *APA Manual* (fifth ed.) detail these guidelines.

6. Change all instances of passive voice to active voice whenever possible, as these changes will be necessary before publication. Spell out each acronym at its first use.
7. Set all margins to 1 inch.

8. Format for 8½ in. x 11 in. paper. Do not format for A4 paper.

9. Please type all copy upper and lower case—do not use all capitals or small capitals.

10. Place all figures and tables in a separate file. Tables need not be double spaced. Indicate the location of tables and figures in text in boldface, enclosed in angle brackets, on a separate line.

Example: **<Fig. 1 here>**

All figures must be camera-ready, suitable for reproduction. Figures will not normally be redrawn by the publisher.

11. Please use your tab key and centering functions to do head alignment, paragraph indents, etc. DO NOT USE THE SPACE BAR.

12. Use endnotes as sparingly as possible. Number them with Arabic numerals starting with 1 and continuing through the article; for example: "(see Note 1)." Do not use footnotes.

Artwork

Figures must be provided as production-ready. Do not use rules or tick marks smaller than 1 point in size. Acceptable electronic formats for figures or other art are: TIFF, EPS, Word, or Excel. If you have trouble loading Excel files, copy and paste them into a Word document. Scans must be of high resolution. Scans done at lower resolutions will have a very poor print quality even if they look

crisp and clear on a laser printout.

Permission

Obtaining written permission for material such as figures, tables, art, and extensive quotes taken directly—or adapted in minor ways—from another source is the author's responsibility. Authors should never assume that material taken from software or downloaded from the Internet may be used without obtaining permission. Make sure to use proper referencing and citation format. Remember plagiarism is a serious academic crime.

Copyright

After your article has been published, you also have the ownership right for your original academic work.

Submit your manuscript to:

All manuscripts submitted will be considered for publication. Manuscripts can be submitted either in soft or hard copy to:

Dean
Research and Industrial Linkages
Centre for Educational Research and Development
Paro College of Education
Royal University of Bhutan
Or Email: cerd.pce@rub.edu.bt   Tele Fax. 08-271620 Phone: 08272829/08272011