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Editorial

This Autumn, *Rabsel* is eleven issues old. All along, *Rabsel* has helped promote a culture of research and enquiry in our education system by providing a forum for the publication of research papers, reflections on professional practices, and views and issues related to education. Every issue of the journal has carried new ideas and insights to all our seats of learning, and beyond.

This issue of *Rabsel* contains research on some of the crucial issues concerning education. *A Paradoxical Role of Supervisors in a Centralised System* explores the virgin territory of human resource development in the Bhutanese education system revealing some insightful findings. The relationship between educational leadership and curriculum development is examined and discussed against the backdrop of the prevailing leadership and curriculum development theories in *Educational Leadership and Curriculum Development— Understanding Relationships.*

Why Aren't Children in Bhutan Reading? answers why reading is not popular among our children through a school-based sample study. *Gender Difference in Mathematics Achievement: A Bhutanese Perspective* presents some interesting findings on the mathematical skills of our girls and boys. It puts some of our perceptions and stereotypes to test.

The choice of research method is a dilemma facing many novice researchers. *Qualitative or Quantitative? A Dilemma Often Faced by Novice Researchers* identifies some salient features of different research methods, which are a key to making the right choice. *The Changing Roles of Teachers and Learners* is particularly relevant to the present-day language teachers of Bhutan. It discusses and asks whether the task-based teaching-learning model can be an alternative to the traditional PPP model.

In the professional spirit of a teacher, the efficacy of group work as a teaching strategy is put under the microscope in *Effectiveness of Group Work in Teaching the Module 'Teaching Science'*. *Sports and Physical Education: Building Muscle for the Nation* discusses the importance of sport and Physical Education in the light of holistic education.

This time in *Voices from the Field*, we feature the views from Tsamang Primary School in Mongar. It adds new perspectives to the things happening in the education circle.

Rabsel has kept the education family, particularly teaching fraternity, professionally connected. Judging by the number of acknowledgements and feedback we receive from various corners of the country, *Rabsel*'s readership is increasing. Its lack of rigour of a fully-fledged education journal has been an advantage. It has served as a platform for encouraging enquiry, reflection, and writing in a system that is yet to fully take off in these fields.

Rabsel will continue to play an important role in our education system's tryst with scholarship and learning.

Tashi Delek.

Needrup Zangpo
Officiating Director

Contents

A PARADOXICAL ROLE OF SUPERVISORS IN A CENTRALISED HRD SYSTEM

Tshewang Dorji[1]

Abstract

This article examines perceptions of the supervisors of the out-country training programmes attended by their subordinates over a five-year period (1999-2003). Altogether, twelve supervisors were interviewed using structured interview technique. The interview questions focussed mainly on the extent of trainees' pre-training motivation and the extent of application of learning to workplaces. The supervisors interviewed, either directly or indirectly, supervised all the 149 trainees selected for this study. Not all the supervisors were fully involved in the process of selection of their subordinates' training. Nor were all the trainees involved in their training decision-making process. The Ministry of Education HRD Committee decided most of the training programmes, and the committee was also the final approving authority of the supervisors' training proposals. The extent of involvement of trainees and their immediate supervisors in the training decision-making process resulted in the difference of perceptions of transfer of learning. The absence or the poor degree of involvement of field supervisors in their subordinates' training selection process prevented monitoring and evaluation of training transfer. The Ministry of Education HRD system involves several internal stakeholders whereby the role of supervisors in their subordinates' out-country training is limited and unclear. The perceptions of supervisors of the partly centralised Ministry of Education HRD system and recommendations to enhance transfer of learning are highlighted.

Background

Out-country training refers to in-service education, training and professional development programmes especially in relation to technical education, higher education and specialisation courses undertaken abroad. The out-country training phenomenon originates from the generic human resource development (HRD) concept, which is widely used to refer to professional development and personal growth activities initiated by employers. Out-country training is prevalent in developing nations as a result of the lack of, or shortage in, requisite capacity of in-country training and education institutions. The majority of these out-country training activities are financed by international development agencies (Ministry of Education, 2002).

Transfer of learning

Training transfer literature emphasises supervisory support in order to ensure transfer of learning. Supervisory support is essential through the whole training transfer process. Offering the right choice of training (Baldwin et al., 1991),

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creating favourable organisational climate and recognising the application of learning through provision of timely feedback (Tannebaun & Yukl, 1992; Rouiller & Goldstein 1993; and Burke & Baldwin, 1999; Brinkerhoff & Apking, 2001) are some specific types of support.

The support of supervisors depends on the nature and the size of organisation. In a large government organisation such as the Ministry of Education, Bhutan, there is a hierarchy of supervisors whose role in terms of facilitating transfer of learning of their subordinates is unclear. In addition, like in any other Bhutanese Government organisations, the HRD system in the Ministry of Education is partly centralised whereby the role of field supervisors is limited. The inadequacy of the involvement of the field supervisors of trainees attending out-country training programmes prevents monitoring and evaluation of training and, therefore, results in poor transfer of learning.

Research has shown that activities that occur prior to training have impact on the training effectiveness (Salas et al., 2001). Motivation is one of them. Knowles (1984) suggested that choice and involvement in the training selection are potent motivators. Pre-training motivation induced through offering the right choice of training has an impact on subsequent learning and transfer (Baldwin and Majuka, 1991). The usefulness of the training can be ascertained through the trainee's involvement in the training decision-making process. Trainees who are offered opportunities to be involved in training design and decisions are more likely to perceive the training as useful for their jobs, thereby resulting in high levels of pre-training motivation. Brinkerhoff and Apking (2001), in their high impact-learning model, call this process 'creating learner intentionality'.

Regardless of the extent of trainees' motivation before training, during training and after training, trainees cannot fully transfer their learning if organisational environment barriers exist. Aspects of the post-training environment can encourage, discourage, or even prevent the application of new learning on the job (Tannebaun & Yukl, 1992). These environmental factors are also known as 'job/transfer climate' (Kirkpatrick, 1998, Goldstein, 1993, Burke & Baldwin, 1999) or 'performance support' (Brinkerhoff & Apking, 2001). Favourable transfer climate provides trainees with the opportunities for practising new skills and knowledge in their job settings (Noe, 1986).

Different writers include different dimensions in the organisational factors that affect training transfer. For instance, according to Baldwin and Ford's (1988) transfer of learning process model, environmental factors refer to 'organisational support' in terms of supervisors, as well as constraints and opportunities to perform better. Burke and Baldwin (1999) define training transfer climate as trainees' perceptions describing characteristics of their work environment that may facilitate or inhibit the use of recently gained trained skills. In short, transfer climate can be termed as either supportive (i.e. favourable, positive) or unsupportive (i.e. unfavourable, negative).

The organisational support variables come from the social support when employees receive from client systems in the organisation (e.g. their supervisors). Therefore,

the creation of supportive organisational environment depends on supervisors. For the purpose of this study, work environment refers to trainees' supervisor support.

Method

Altogether, twelve supervisors were interviewed using structured interview technique. The supervisors included one head of the two teacher training institutes, six divisional heads and four district education officers. One division head was represented by two of its section heads. The interviews were targeted towards gathering supervisors' collective perspectives on the effectiveness of the training undertaken by their subordinates. The supervisors interviewed supervised all the 149 trainees selected for this study, either directly or indirectly. The supervisors directly supervised 68% of the trainees while 32% of trainees received indirect supervision from two supervisors. Indirect supervision implies supervision from supervisors based at Headquarters, either in the Personnel Section or in the Education Monitoring and Support Services Division. The former office is responsible for monitoring and evaluation of performances of all staff, and the latter office is responsible for school staff. Therefore, it can be said that the interviewed supervisors supervised 100% of survey participants.

The supervisor structured interview questionnaire comprised four questions. The first question dealt with pre-training motivation and consisted of five-item measure based on Likert-type scale. Question number 2 ascertained the extent of application of learning acquired in the training by trainees to their workplaces. It also focussed on discovering any factors impeding application of the learning. Question number 3 explored the existence of a system of sharing learning with other workmates at the workplaces. The question consisted of four-item measures based on Likert-type scale. The fourth question was aimed at collecting the perspectives of supervisors of out-country system and recommendations for improvement.

Quantitative data was analysed using descriptive normative figures, frequencies, means, percentiles etc. On the other hand, responses to open-ended interview questions were grouped into thematic orders and listed in a rank order. Responses to the interviews were analysed to extract dominant themes.

Research question 1: To what extent were the trainees motivated through involvement in the process of their training decision -making?

The objective of this question was to gain supervisors' perspective of pre-training motivation of all the trainees.

Table 1: Collective opinion of supervisors on pre-training motivation for all trainees

Measures	Scales				
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree

All the trainees were involved in the training decision-making process	17%	50%	8%	25%	0%
All the training programmes were relevant to the candidates	0%	0%	8%	58%	33%
The training objectives were discussed with the candidates	0%	17%	25%	42%	17%
The candidates were accountable for learning and application	0%	0%	25%	58%	17%
I believed that the candidates had the potential to learn.	0%	0%	0%	83%	17%

The majority of the supervisors mostly disagreed to the statement concerning the trainees' involvement in training needs decision-making process. They, however, mostly agreed to other statements on training relevance, setting of training objectives, learning accountability and trainee ability.

Research question 2: Have the candidates been able to apply the learning acquired during the training to their jobs? If not, what are the possible barriers to their application of learning?

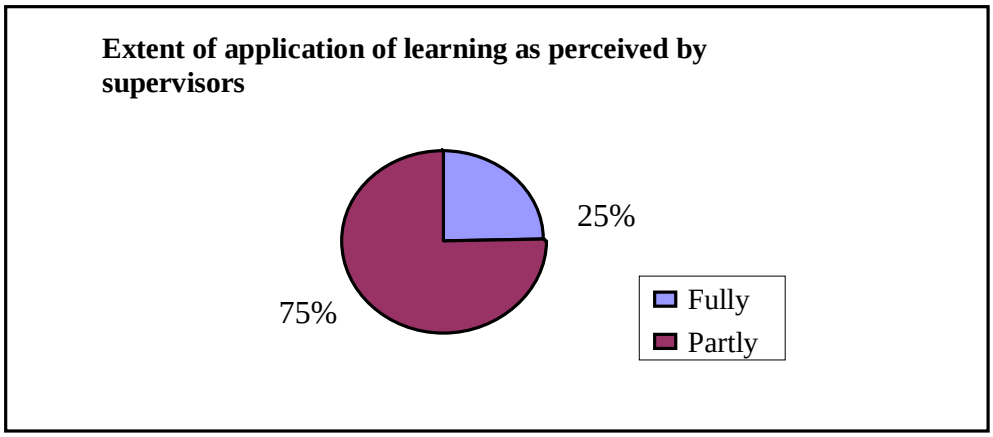

Figure 1: Perception of supervisors of trainees' application of learning

The majority of the supervisors (75%) perceived that the trainees applied their learning to workplaces partly. Only 25% perceived full application of the learning. Only trainees who participated in short-term skills-based and project-tied training were able to apply their learning fully. Such types of training had more specific training objectives and were mostly conducted in groups. For example, trainees from School Planning and Building Division participated in a project-related group training whereby they were able to learn and apply jointly soon after their return. Some supervisors, nevertheless, admitted the fact of the lack of a system for monitoring and evaluating their subordinates' performance after training.

Question 3: Since the candidates returned from their training, have they shared their learning with others in the organisation?
The purpose of this question was to see whether the learning acquired through the limited opportunity of out-country training was shared with other colleagues in the organisation.

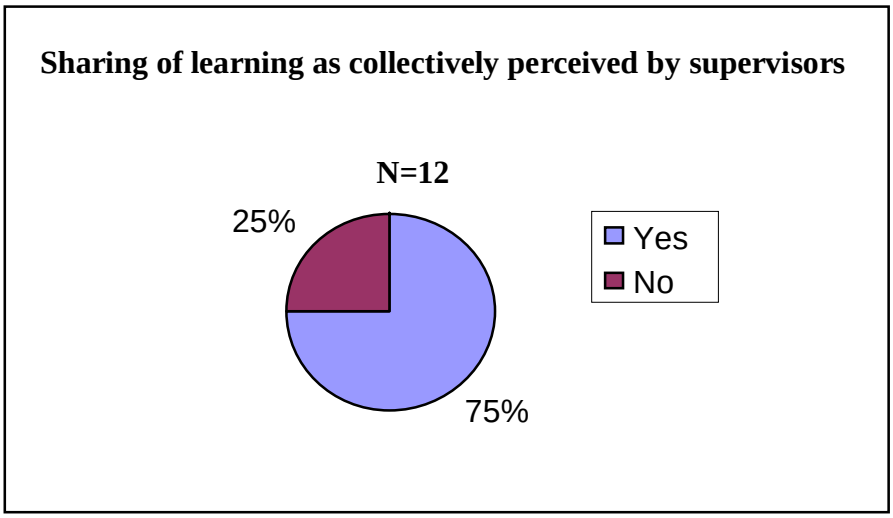

Figure 2: Perception of supervisors of trainees' sharing of their learning

The supervisors perceived that more than 75% of the trainees shared their learning at workplaces through different modes. For example, several academic trainees either conducted or facilitated in-country training in the fields of curriculum change, teaching pedagogy, subject refreshers etc. Trainees from the School Planning and Building Division also imparted training to private school builders on various topics such as new technology and construction project management.
Responses to part 'B' question 3 indicated the common modes of sharing learning after training.

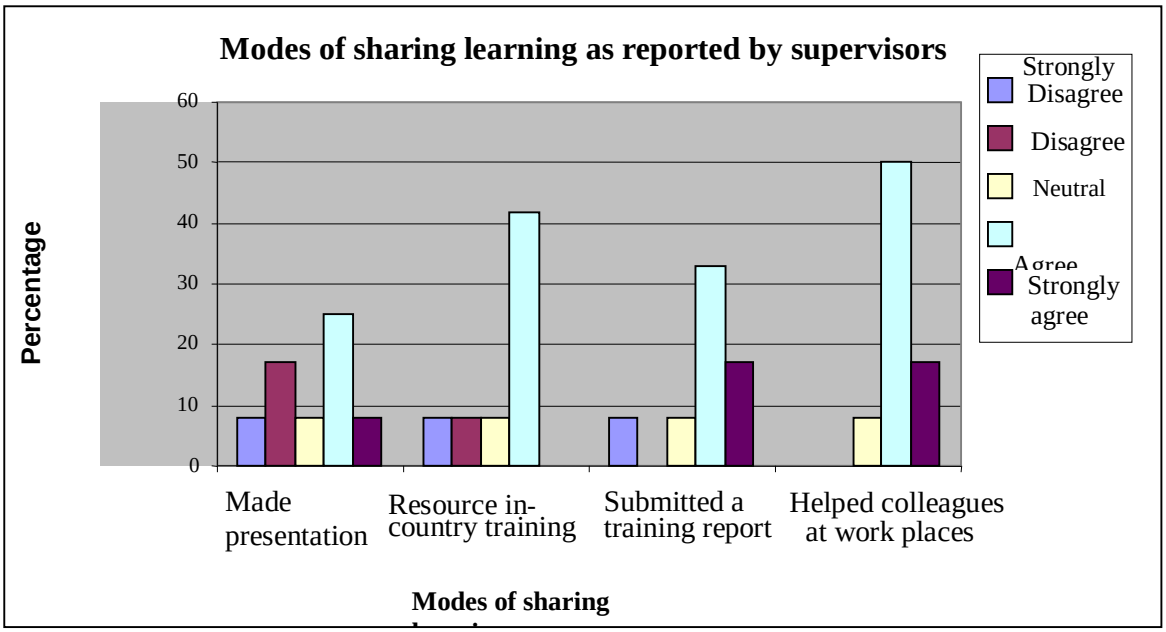

Figure 3: Perception of supervisors of trainees' mode of sharing their learning

The most common mode of sharing was informal conversation followed by resourcing in-country training programs and submission of training reports. The academic trainees mostly shared their learning through conversation and in-country training. However, there was no standard mode of sharing learning required to be followed by trainees.

Question 4: What are your general perceptions of out-country systems and recommendation for its improvement?

Overall, the supervisors appreciated the effectiveness of out-country training programme. Some however, made several comments and suggestions for its improvement. The responses are grouped and ranked under six headings: selection criteria; monitoring and evaluation; right placement after training; HR information and administration; involvement of supervisors in training selection; HRD programme inconsistency; and proper organisational HR needs assessment. (see Table 2)

Table 2: Supervisors' perceptions of the ministry's present HR system

Themes of responses	**%**
Selection criteria	21
Monitoring and evaluation	21
Right placement after training	17
HR information and administration	14
Involvement of field supervisors in training selection	10

HRD program inconsistency	7
Proper organisational HR needs assessment.	7

Discussion

The supervisors confirmed that out-country trainees were normally not involved in training decision-making process. Only 25% of the supervisors reported that the trainees were involved in training decision-making and 42% reported that trainees were involved in setting of training objectives processes. They had their own views as to why the trainees were generally not involved in the training decision-making process, and why the organisational needs overrode individual needs. Though little emphasis was made on the involvement of trainees in the training needs decision-making process, they had some involvement in setting of broad training objectives. Training decisions were generally based on the nature of the job responsibilities held by the prospective trainees prior to the training. In addition, the limited options of out-country training opportunities reportedly restricted the negotiation of the training needs between the respective individuals and the organisations. Usually, out-country training programmes are pre-determined, and are limited in number. In such a situation, discussing prospective trainee's personal training interest may not make any difference.

The general literature on training transfer, however, emphasises the importance of involvement of trainees in the process of their training needs identification and setting of training objectives.

The trainees were not actively involved in the process of training decision-making and objectives setting processes. Objectives of the training were broadly discussed and informally agreed between the supervisors and the trainees. This particular information indicates that there is definitely a lack of a standard system for planning and implementation of out-country training programmes. Also, the process certainly lacked the system for setting of training objectives and work targets between supervisors and trainees. According to Kim (2004), the lack of training objectives and work targets can result in inappropriate estimation of trainees' work performance after the training. In such situations, trainees will also not feel accountable for learning and transfer of their learning, and supervisors too cannot monitor and evaluate the performance of their trainee subordinates.

Regardless of the extent of involvement of trainees in the processes of decision-making and objectives setting, all the training programmes were reportedly relevant to the trainees' jobs and almost all trainees developed positive attitude towards the training.

Supervisors' collective perception of the application of learning by trainees

Perceptions of the supervisors were collected to either confirm or refute the self-reported data of the trainees on the extent of learning transfer. Twenty-five percent of supervisors felt that trainees were able to transfer their learning fully. This perception may not be valid in view of the lack of system for setting training

objectives and work targets. Without some agreement among stakeholders about the expected outcomes of training, desired performance results are likely to be estimated inappropriately (Kim, 2004:122). The absence of such agreement could lead to supervisors' development of unrealistic expectation about the trainees' performance. Non-fulfilment of this expectation can estrange work-relationship between supervisor and trainees. Secondly, the size of supervisors' sample (N=12) is small compared to trainees' sample size (N=97). One supervisor's negative perception can largely affect the supervisors' overall perception.

Barriers to application of learning by trainees

Supervisors reported the lack of a standard HRD system as the main factor affecting application of learning by trainees. The lack of clearly laid down training objectives prevented focus of trainees' learning (Knowles, 1998). The absence of pre-determined training objectives agreed formally between trainees and their supervisors prevented both trainees and their supervisors from monitoring and evaluation of learning and its application (Kim, 2004).

There are other reasons for the lack of post-training performance monitoring and evaluation system. Firstly, there is no requirement of any comprehensive system for monitoring and evaluation after the training. Data from the supervisors indicate that, overall, the departments/divisions/sections or individuals are less proactive in terms of ensuring training transfer. They strictly abided by the system instituted by the Ministry of Education head office. Secondly, generally, there is the lack of a system for formal setting of training objectives in detail between supervisors and trainees. Even if training objectives were discussed, they were usually broad and verbal. Such broad and verbal training objectives neither enabled the trainees to focus their studies on, nor did they hold the trainees accountable for ensuring transfer of learning. Under the circumstances of lack of any explicit training objectives, supervisors also did not bear the responsibility of assessing the training outcomes after the training.

Eventually, the lack of clarity of training objectives did not hold trainees accountable for applying their learning to their work. The supervisors' perception of the need for HRD policy improvement reported earlier support the importance of a robust HRD system for the transfer of learning to occur.

Maintenance of the learning in workplace can be ensured through an emphasis on 'multiplier-effect'. Learning can be multiplied through sharing of it with work-mates either formally or informally (ADB, 1997; ODA, 1992). Sharing of learning with work colleagues also enhances good working relationship (ADB, 1997). According to Bras, Tichey and Dansky (cited in Cromwell & Kolb, 2004), the process of exchange of information after training can also help trainees utilise peer networks. More than 85 percent of trainees under all categories reported to have shared the learning in one form or another. Supervisors also perceived that more than 75 percent of trainees shared their learning in the workplaces. However, there was no standard requirement of trainees to share their learning to multiply the benefit of the training in the organisation. The most common modes of sharing the learning were informal interaction and helping on-the -job.

Credibility of trainee selection criteria was one of the major concerns of the supervisors. To 21 percent of supervisors, the candidate selection systems followed by all agencies in the ministry was generally not commendable. Particularly, the training programmes planned and implemented directly by the ministry headquarters seemed to lack an open and competitive system for selection of candidates. The supervisors believed that the standardisation of robust selection criteria could facilitate maximisation of out-country training benefits.

Another 21 percent of the supervisors viewed the lack of monitoring and evaluation system in the out-country training process as a major impediment to transfer of training. Any training expenditure was regarded as an investment that would automatically accrue positive returns. As such, trainees were trusted to return from training with greater knowledge and skills to perform their jobs better. One supervisor considered monitoring and evaluation tasks personally sensitive. The HRD policy of the Ministry of Education did not stress the importance of it. Therefore, he confessed that he would be unpopular to introduce monitoring and evaluation system, which other divisions and sections do not adopt.

Another major concern expressed by 17 percent of the supervisors was the need for right placement of trainees after their training. They thought that the decision makers for deployment of staff did not consider the skills and knowledge those staff possessed. They recommended development and maintenance of a training database linked to the personnel information system to facilitate an effective deployment system.

Similarly, the need for maintenance of HR information was highlighted by 14 percent of the supervisors. They viewed it as highly useful in order to make any HR-related decisions credible and effective.

Ten percent of the supervisors perceived that supervisors whose subordinates were directly identified for training by headquarters lacked motivation to evaluate trainees' performance. Consequently, the supervisors also lacked the sense of responsibility for monitoring and evaluating their subordinates' performance after training. This situation, some supervisors thought, did not hold trainees accountable for learning and application of their learning.

Over all, the factors reported to be affecting transfer of learning in this study fall within the theoretical framework of Baldwin & Ford (1988). However, a robust HRD standard system seems to play a major role in ensuring transfer of learning in case of the Ministry of Education. For instance, the lack of policy emphasising setting training objectives by all divisions/sections resulted in chain effects in subsequent stages of training process. The lack of clearly laid down training objectives prevented focus of trainees' learning (Knowles, 1998). The absence of pre-determined training objectives agreed formally between trainees and their supervisors prevented both trainees and their supervisors from monitoring and evaluation of learning and its application (Kim, 2004). Eventually, the lack of clarity of training objectives did not hold trainees accountable for applying their learning to their work. Perception of both trainees and their supervisors of the need

for HRD policy improvement reported earlier support the importance of a robust HRD system for the transfer of learning to occur.

There is a need for a standard HRD system, and consistent commitment of employers (supervisors) and trainees towards the implementation of the HRD system.

Conclusion

Training literature highlights the importance of supervisor role in ensuring transfer of learning by their subordinates. The role of supervisors, however, depends on the nature of organisation and its systems. In a situation where out-country training and deployment systems are centralised, such as the Ministry of Education, the role of supervisors in their subordinates' training is ineffective. Not all field supervisors got an opportunity to participate in their subordinates' training. Nor did all the trainee subordinates participate in their training decision-making process. The lack of an opportunity to discuss training between supervisors and their subordinates prevented monitoring and evaluation. The supervisors estimated that trainees applied only 25 percent of their learning fully while 75 percent applied partly. Nevertheless, as Kim (2004), suggests, the lack of training objectives and work targets could have resulted in inappropriate estimation of trainees' work performance after the training. In a situation of lack of jointly pre-determined training objectives, trainees will also not feel accountable for learning and transfer of their learning. In addition, the supervisors too cannot monitor and evaluate the performance of their trainee subordinates. An HRD strategy is ineffective without a training monitoring and evaluation system. The process of such strategy was uni-directional rather than cyclical. The supervisors recommended standardisation of the out-country training system including involvement of right level of supervisors in their subordinates' training process.

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EDUCATIONAL LEADERSHIP AND CURRICULUM DEVELOPMENT: UNDERSTANDING RELATIONSHIPS

***Karma Yeshey*[2]**

Introduction

Curriculum is an important and a critical lifeline in education, and leadership has a critical role to play in the efficacy and success of curriculum development. This paper is an attempt to find a relationship between educational leadership and curriculum development, particularly how the leadership role could support the success of curriculum development.

However, the concepts of leadership and curriculum mean different things to different people. Even the practitioners and academicians have differed in their views in these two expansive subjects. Any attempt to understand the relationship between the concepts of educational leadership and curriculum development would invariably require one to get a grasp, even if it means in passing, of the concepts of leadership and curriculum.

Cognizant of this need, section two of this paper will attempt to understand the concept of leadership through various theories of leadership, exploring merits and demerits as discussions take place. Educational contexts of leadership will also be explored. In section three, an attempt will be made to understand the concept of curriculum and its development against a backdrop of various curricular claims. Section four, the final section, will attempt to find a relationship between educational leadership and curriculum development and draw pointers for educative leadership to play a role within the context of curriculum development for its success.

Leadership

Over the years, many different conceptual and operational definitions of leadership have been proposed and even accepted sometime or the other. Many times, these definitions and concepts posed problems in understanding the nature of leadership per se. In this section, some of the major conceptual and operational leadership definitions will be discussed in terms of major emphasis and their validity.

One of the major conceptual and empirical approaches to research into leadership has been the initial emphasis on distinguishing certain 'leadership traits' in the individual's personality or physical make-up in which researchers spent considerable amount of time (Watkins, 1986, p.11) (**The Trait Approach**). However, investigating trait studies of leaders, Stogdill (1970 in Watkins, 1986, p.11) concluded that the qualities, characteristics and skills required in a leader are determined, to a large extent, by the demands of the situation in which he or she is to function as a leader.

Stogdill's investigation of the trait studies led to approaching leadership behaviour in terms of certain situational variables, such as the nature and distance of the group goal and the motivation of the group. In this approach, notions such as 'consideration' (relationship behaviour) and 'initiating structure' (task behaviour) were considered as basic dimensions of leadership behaviour in formal organisations (Watkins, 1986, pp.13-14).

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However, **Situational Leadership** had its own share of criticisms. Despite its strengths in achieving goals through task and relationship behaviours of leaders, many scholars have criticised the approach for 'working by stealth in seeking to manipulate the employees of organisations' (Watkins (1986, p.17).

Parallel to the situational leadership model was the Lewinian model of leadership style, graded in the theoretical continuum from authoritarian to democratic leadership (Watkins, 1986, p.17) (**The Style Approach**). This was similar to situational approach in that it attempted to 'stroke' employees through advocating democratic leadership without any fundamental change in power distribution within the organisation (p.17). Further, like other approaches, criticisms on this approach were that it 'was concerned with extracting greater productivity while legitimating the power status quo and the class relations of organisations' (Watkins, 1986, p.21).

In 1967, Fiedler attempted to synthesise the 'Trait' and the 'Situational' approaches with the 'Style Approach' of leadership, which he termed the **'Contingency Model'** of leadership. Fiedler's model of leadership assumed that the leader's contribution to group performance depend on both his or her leadership style, in terms of either task orientation or person orientation, and the favourableness of the situation for the leader (Watkins, 1986, p.21).

Fiedler also produced a trichotomised version of the three dimensions which showed that 'group-task situations' varied over a continuum from favourableness to unfavourableness (Watkins, 1986, pp.24-25).

However, Fiedler's three variables have been criticised, particularly 'leader-member relationship' for ignoring relationships among group members, which are important for the ability of the leader to influence group members (Mitchell et al, 1970-71 in Watkins, 1986, p.24). The model's further criticism has been that it represented a static picture of the leaders' followers, in which followers are acted upon and led (Watkins, 1986).

Through a brief tour of various leadership approaches, it is clear that most of the conventional approaches to leadership are under attack on all fronts. As an alternative, Watkins (1986) offers two alternative approaches to the study of leadership – *a critical approach centering on ideas of class, power and human agency* and *a dialectical approach to leadership centering on ideas of symbols and metaphors* – as a basis for further study.

In Watkins' (1986, p.33) views, **a critical approach** to the concept of leadership 'focuses on the power dimensions which underlie the process of reality construction and give force to the human agency of people in organisations'. He points out that school administration would be founded on a more equal power basis if schools adopted a critical view of leadership within schools, by way of recognising that all human agents have some degree of knowledge and unmasking manipulative and deceptive tactics. As a consequence, he argues that 'many administrative practices would become demystified as the school community gained a critical understanding of those processes central to the reshaping of school administration on a more participatory, collaborative basis' (p.33)

The second alternative Watkins offers is to 'view leadership as a dialectic relationship in the social construction of reality' (p.34). In this regard, Smircich and Morgan state:

The phenomenon of leadership in being interactive is by nature dialectical. It is shaped through the interaction of at least two points of reference, i.e. of leader and of led. (Quoted in Watkins, 1986, p.34)

Watkins points out that 'a dialectic view of the leadership process focuses on the human agency of all members of the organisation as that agency interacts with the constraining or enabling structure of the institution' (p.34). With the social world in a continuous state of becoming – ongoing, flowing, and dialectic of transformative human action – Watkins argues that 'leaders become followers and followers become leaders in the ebb and flow of organisational interaction' (p.35).

Watkins (1986, p.35) notes the metaphor that the tensions and contradictions provide the thrust within any dialectical relationship, presumes that organisations have a tendency towards disintegration. By the same token, he points out that the resolution of these organisational tensions and contradictions may give rise to a new unity, which may in turn give rise to new symbolic heroes. Therefore, 'this use of symbol and metaphor exemplifies the rich and complex patterns of cultural activities which are to be found in all social institutions' (p.35).

2.2 Educational leadership

Criticisms on most of the conventional approaches to leadership, as seen in the previous section, cannot be different for educational leadership, rather they should be same. In this regard, Duignan and Macpherson (1992, p.1), in the introductory chapter to *Educative Leadership: A Practical Theory for New Administrators and Managers* wrote: 'It was not by accident that the first of the eight major recommendations of the National Commission for Excellence in Educational Administration (1987) in the United States of America was that educational leadership should be redefined'. In this section, approaches to leadership particularly in the educational context will be explored.

The US's National Commission for Excellence in Educational Administration, after much hard work with multifaceted programmes, still asked the basic question: what is 'good' or 'excellent' educational leadership? The three education systems in Australia in 1986 sought to answer the Commission's question through the Educative Leadership Project (ELP) by seeking to break new grounds in educational administration that the wisest approach to leadership in education is that it be *educative* (Duignan et al, 1992, pp.1-2).

The ELP's point of departure is that an *educative leadership* should 'be concerned with the ways of knowing organisations and ways of leading that find expression in the cultural norms of the group, the educational organisation or the system' (Duignan et al, p.3). Duignan et al argue that they see 'organisations as cultures, that is, the concerted imaginations of organised people who share assumptions, values, interpretations of their situation and meanings that they give to their actions' (p.3).

Duignan et al (1992, p.4) visualise an educative leader as one who 'communicates a sense of excitement, originality and freshness in an organisation'. They believe that an educative leader is a person who 'challenges others to participate in the visionary activity of defining 'rightness' and preferred ways of doing and acting in education'. And they also see an educative leader as a person who 'challenges educators to commit themselves to approaches to administrations and professional practices that are, by their nature, educative'. By that

they are not denying that leaders in education need to be efficient but that they are convinced that there is much more to educative leadership than managing for efficiency (pp.4-5).

Evers et al (1992) bring in an ethical and moral dimension to leadership. One could not agree more with them that the exercise of leadership in most contexts involve, directly or indirectly, scope for decision-making and influential action. They argue that the decisions taken affect how and what people learn which have very long-term consequences, which is precisely the reason for the ethical and moral dimension to leadership.

Within the ethical framework of leadership, Evers et al (1992, p.31) argue that the central task of a leader would be to provide *educative leadership*. They point out that just as leadership is a matter of facilitating, by example or otherwise, sound organisational decision making, the pragmatic and holistic view of knowledge growth through feedback enhanced problem-solving. That is, a leader must be an *educator* as someone concerned with creating, promoting and applying knowledge.

Evers et al provide five criteria against which educative leaders should be judged:

- their ability to develop and maintain an effective inquiry and problem-solving culture in their domain;
- their ability and tolerance of different points of view and an acceptance of criticism as the key ingredient in the growth of knowledge within the organisation;
- their ability to adapt to challenges and provide for change in policy or practices through participative feedback and reflection;
- their concern to ensure that people have the freedom to fully participate in this process of learning and growth; and
- their commitment to the holistic belief that their decisions can be defended on the basis of their contribution to the benefits of long-term learning within the organisation.

In light of discussions on leaders being educative, Duignan et al (1992, p.183) developed a holistic practical theory of educative leadership, which they have represented in three metaphysical realms as shown in the figure on next page:

- activity conducted in a material world,
- cultural agency in a social world, and
- reflective practice in an abstract realm of ideas.

Duignan et al recommend that educative leaders give balanced and integrated attention to the imperatives of all three realms, providing a holistic view as indicated by the area of intersecting arcs in the figure. They explain their educative leadership model as under:

The realm of ideas demands attention to what is right and what is significant at team, individual and system locations. This requires philosophical and strategic appraisal of abstract issues and problems, prior to the development of new policy, in a way that links consequences to material and political contingencies. The tools of philosophy and the policy sciences are highly relevant.
Another realm, the realm of social reality, begins where significant but abstract concepts cease being simply ideas and become valued cultural artifacts. The cultural elaboration of a

policy is achieved through realignment of meanings given to social reality, and legitimation of changed professional practices. The tools of political science and social-psychology become more relevant.
The final realm demands attention to the practical realities of performance, resources, and consequences; reality as things. In this realm, educative leaders devote themselves to managerial and evaluative activities to relate expenditure to valued outcomes in the areas of learning, teaching and leading. The tools of management science become relevant but require substantial reinterpretation.
(Duignan et al, 1992, p.184)

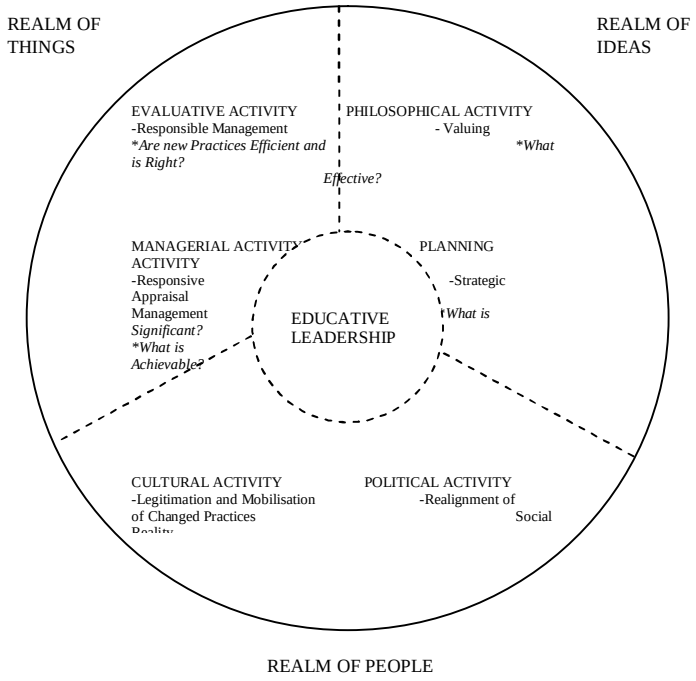


Figure: A practical theory of educative leadership (Duignan et al, 1992, p.183)

Duignan et al (1992, p.84) concluded that to ensure holographic conditions, educative leaders must help create, maintain and develop the links between the three realms. For instance, they point out that paying attention to the core values of effectiveness and efficiency will help create coherence between:

- the production and selection of valued and significant ideas;
- managerial and evaluative activity; and
- question the continuing appropriateness of the organisational culture.

In like manner, they further go on to say that 'collaborative decision making will help create coherence between the making of policy, its cultural elaboration, and, therefore, its implementation'. They also believe that educative leadership should be 'holistic, pragmatic,

values-driven and cultural activity intended to enhance performance in the areas of learning, teaching and leading' (p.184).

Curriculum and its development

Thinking about curriculum, one begins to wonder: 'What is curriculum, anyway?' In order to address this question, areas such as curriculum and teaching, its interpretation, its contestation, and its development will be explored in this section.

Curriculum and teaching

Curriculum is often thought of as syllabus documents, policy statements, teacher guides, etc. This is a narrower view of the curriculum. Grundy (1994, p.28) tells us that there are two different, yet complementary ways of thinking about the curriculum: thinking of it as an *object* and the other as an *action*. She says that while we use the same word in each case, the meaning and implications can be substantially different. She illustrates how this can be so using the term *football* as analogy, in which football can be an object (the ball itself) or an action (the game). Grundy notes referring to football as an object means something tangible – one can feel and touch it – a constructed object whose design and construction will vary according to the game for which it has been constructed, such as Rugby, Soccer, etc. In like manner, thinking curriculum as an object means seeing and pointing it in syllabus documents, policy statements, teachers' work programmes, etc., which appears to be something to be given, transmitted or passed on to students. Grundy points out that even considering curriculum as an object, it is no longer widely assumed that it has necessary or pregiven form, arguing that the curriculum changes over time and is different in different places and also can be changed from time to time as the educational game changes.

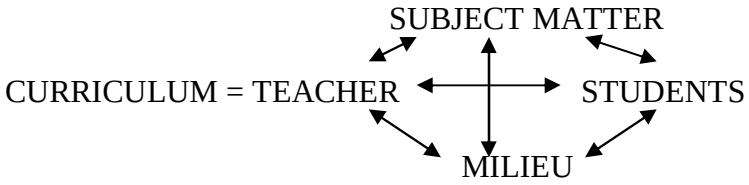
On the other hand, when curriculum is thought of as being analogous to the *game* of football, it becomes clear that the object that is provided for the playing of the game is only one component, Grundy (1994, p.29) points out. She says what is important is the game itself, 'how it develops, how the player engage in it and the strategies by which the game is played'. From this metaphorical viewpoint the curriculum is constructed in the playing. Grundy draws further comparisons: 'just as there are different codes and rules by which the activity of football is played out, so also there are different ways of constructing the curriculum during the process of teaching and learning' (p.29). Furthermore, Grundy points out that the game of football gains its meaning through being played and not really by reading the rule book. So is the case with curriculum, the important thing being the way it is 'played out' in the teaching/learning situation.

The two views of the curriculum, in other words, are the syllabus view and the pedagogical view. In the syllabus view of the curriculum, Grundy (1994) points to an incongruity that the syllabus for whom it is intended, the students, are not the direct receivers. Unlike in the game of football, the curriculum that students receive is essentially the syllabus mediated by and through the teachers' skills', which is seen as:

SYLLABUS + TEACHER'S SKILL = CURRICULUM STUDENTS →

Taking the pedagogical view of the curriculum, Grundy (1994:32) points out that there is a suggestion that one cannot actually have a curriculum without active participation of the students. The official documents of curriculum are simply texts for teachers to interpret and

not the curriculum per se, she argues. She goes on to say that the authentic curriculum is produced as a result of the teacher and the students interacting together in the light of policies and the syllabus, within a social and cultural milieu, which is represented as:



Grundy (1994, p.38) points out that understanding that the curriculum is a construction in which all participants in the educational enterprise are actively involved is centrally important to the understanding of the meaning of curriculum and the work of teaching. She further puts forward that it is not an adequate position for teachers to assume that the 'curriculum is developed in one site and that their task is to deliver it to their students'. Rather 'schools are the primary sites for the construction of the curriculum and teachers along with their students are principal participants', she argues.

Interpreting the curriculum

Grundy (1994) argues that the curriculum is a social construction and that it is determined at particular historical times in particular locations, within a particular society or even a particular school, according to what is judged to be the most appropriate subject matter, learning environment and ways of learning. This follows that 'the curriculum is not value-neutral, but represents the dominant or hegemonic values of a society and/or community at that historical moment' (Grundy et al, 1994, p.111).

School curricula might be interpreted through some of the common curriculum discourses. While there is an abundance of discourses, there are certain common patterns in value positions (Grundy et al, 1994, p.115). Kemmis et al's (1983) work represents such a discourse in which they have identified and analyzed three curricular discourses – the *vocational/neo-classical,* the *liberal/progressive,* and the *socially-critical* orientations – each 'embodying quite specific beliefs and values about people, power and the role of education in society' (Grundy et al, 1994, p.115).

Grundy et al (p.115) point out that the three orientations discussed by Kemmis et al outline some of the areas manifesting themselves in contrasting values which present three distinctly different discourses of education for consideration. Put differently, Grundy et al (p.115) emphasise that this is not just about 'idiosyncratic differences in styles of school or classroom operation, but about some fundamentally different, but taken-for-granted, assumptions about what education is about and in what ways it should be engaged'. A brief discussion of the three orientations identified by Kemmis et al (1983) would be helpful.

The *vocational/neo-classical* discourse viewing schooling as 'preparation for work' would interpret education as predominantly concerned with the ends of schooling and manifested itself in an assumption that curriculum consists of a body of content to be delivered to students (Grundy et al 1994, p.115). Similarly, the *liberal/progressive* viewing education as a preparation for life with aims of development of autonomous persons would 'help individual students realise their full potential and to take their place in society as responsible students

rather than simply as economic contributors' (Grundy et al, 1994, p.116). Further, acknowledging students as active constructors of their own knowledge rather than receivers, there would be an emphasis on the process by which the curriculum gets constructed and learning takes place, rather than on the end product of schooling (p.116). Education regarded as an intrinsic part of life and work within a *socially-critical* discourse, it would interpreted as education must 'engage social issues and give students experience in ... critical reflection, social negotiation and organisation of action' (Grundy et al, 1994, p.116).

Grundy et al (1994, p.117) point out that while it might be quite acceptable that a teacher's strategies may include a range which could be associated with any of the orientations, they argue that 'educators have a responsibility to interrogate their practices and strategies to determine if the patterns of their language and actions imply value positions inimitable to principles about social justice'. They also note that 'while all three discourses allow for concern about justice, only the socially-critical orientation is concerned to redress disadvantage by encouraging direct action' (p.117).

Curriculum contestation

As Laird et al (1994, p.137) note, 'the history of schooling reveals that the policies which shape the curriculum are always the subject of contestation amongst individuals and groups reflecting a range of different value orientations'. This contestation can be found at all levels ranging from the classrooms to the political levels.

The three curriculum discourses identified and analyzed by Kemmis et al (1983) is an example of curriculum contestation. For instance, the *vocational/neo-classical* discourse treats education as a preparation for the future, particularly a future as a member of the workforce and contends that education must be a means to an end. Similarly, in *liberal/progressive* discourse, education regarded as a means for life as well as for its own worth, contests the role of education in facilitating the realisation of individual potential for students (Kemmis et al, 1983). In like manner, a *socially-critical* discourse contests that education must 'engage social issues and give students experience in ... critical reflection, social negotiation and organisation of action' (Kemmis et al, 1983, p.9).

Like Walmsley's (1981 in Laird, 1994, p.137) assertion, 'curriculum development is a values-driven process'. Even Tyler's (1949 in Stenhouse, 1975) objectives model can be said as values-driven as, for that matter, he finds value in framing the curriculum through objectives model. What is important for now is to recognise and be aware that there are ample contestations to the curriculum development, whether or not the contestations are based on sound philosophy of education and the values attached to it.

Curriculum development

Warhurst et al (1994, p.167) point out that one dominant, but contested, way of understanding curriculum development is the syllabus view of curriculum (Grundy, 1994). They observe that as per this view, 'the curriculum is developed by experts outside the school environment and then given to teachers to deliver to students' (p.167). Within this view, they point out, resides 'the traditional power relation dependency' of curriculum delivery: 'Teachers are dependent upon curriculum experts to tell them what to teach, and students are dependent upon the teachers to tell them what they should learn', besides a false assumption that all students will receive the same curriculum.

Similarly, the alternative approach, the pedagogical view (Grundy, 1994), finds the central place of both teachers and students in engaging with the content and the processes of learning in the construction of the curriculum, whilst not denying the importance of policies and syllabi developed by those with expertise outside the school (Warhurst et al, 1994, p.167). Warhurst et al note that pedagogical view approach to curriculum construction 'acknowledges that policy, history and tradition, geographical environment and economic climate, as well as community expectations, are part of the dynamics that shape the curriculum of a particular school' (p.167). They point out that these contextual factors either assist or constrain teachers in their classroom practice. They find this view of curriculum construction 'a dynamic and ongoing process in which teacher, student, content and milieu all exert a powerful influence on the teaching/learning process' (p.167). They also point out that the knowledge the students bring with them to the classroom is as critical to the teacher's professional knowledge and judgment.

However, Warhurst et al (p.168) find certain unpredictability in this process of constructivist approach to curriculum making, and therefore they suggest focusing on the four commonplaces of schooling: milieu, subject matter, students and teachers, in order to enhance learning outcomes for students.

Of the many aspects to milieu, Warhurst et al (p.168) decide to consider just two – the policy context of schooling and teaching and the social and cultural context of the school. In terms of the milieu as policy context, Warhurst et al (p.168) observe that 'there is a tendency to assume that teachers working at the school level have nothing to do with curriculum development because curriculum policy is developed elsewhere, and teachers are the implementers, not initiators, of curriculum change'. In this regard the authors remind that policy should not be seen merely as a restraint on teachers or as a recipe for certain approaches to teaching. They argue that while policy will certainly be influential in shaping the curriculum of any school, there is still curriculum work to be done by teachers.

Similarly, Warhurst et al (p.170) point out that societal issues are also school issues and that what goes on in the wider society affects what goes on in schools. For instance, they argue that an isolated rural school provides a completely different set of circumstances and challenges for a teacher than does a school in a very affluent area of a large city. Yet, the syllabus view of curriculum makes these differences invisible as well as hide the educational dilemmas faced by teachers in such disparate schools. They point out that teaching is not a technology to be applied in different sites in similar manner and that teachers' work is context dependent and so is the curriculum of a school.

Relationship between leadership and curriculum development

Having given a fair treatment on the concepts of leadership and curriculum in the previous sections, a cursory treatment of leadership in curriculum development will be made in this section.

As with Walker et al (1992, p.47), we might expect leadership in education 'should contribute understanding of and respect for genuine differences in needs, problems and opinions. It should facilitate the learning that leads to such understanding within decision making about education as much as in classroom teaching and learning. Leadership in education should

be *educative*, in intent and outcome'. Of course leaders in education going through intense pressures, one might wonder how this is possible (Walker et al).

Walker et al offer some practical solutions to the problems of educational leaders. They argue that school principals, team leaders and system administrators will be better equipped to tackle their problems and promote their roles as educational leaders by taking: decisive role in curriculum development. In particular, they point out that 'it is in the interest of educational leaders to *take the lead* in public as well as in professional debate about the direction education is going, otherwise they would find that in a context of increasing public concern about and political pressure on education, their roles as educational leaders could slip away from them' (p.47).

The practical solution Walker et al offer is a problem-solving approach to educational leadership. They claim that 'there is a practical payoff for leaders if they take the trouble to analyze their situation carefully, clarify their own values and views of knowledge and learning, and try to understand the problems of others in education' (p.47).

In this practical solution Walker et al advocate a clear role for educational leaders, consistent with this problem-solving approach. The role they advocate for educational leaders is *educative* (ELP): 'the educative leader is a negotiator, an analyst of educational situations, an evaluator of the relative merits of a variety of often conflicting viewpoints, a confident decision maker, a teacher, and, most importantly, a learner' (p.48). They point out that the leader brings all these together in curriculum development.

Walker et al claim that this role and the problem-solving approach it reflects derive, in turn, from a definite philosophy of educative leadership. They point out that 'leaders themselves develop their philosophy by critically but practically scrutinising their own educational values, their views of learning and the nature of knowledge. This philosophy, then, makes no bones about insisting on the importance of theory for effective educational leadership' (p.48). They, however, argue that theory is not merely a product of academic theorists; that it is always present in practical decisions and actions. Indeed 'our actions as leaders reflect our values, our views of learning and knowledge in the curriculum, and our approaches to the politics and administration of education' (p.48).

In the subsequent paragraphs, the playfield of the curriculum development within which *educative* role will be played by the educational leaders through problem-solving approach will be briefly explored based on the work of Walker et al (1992).

The Scope of Curriculum theory:

Given the wide variety of views of the scope of curriculum theory and research and the diversity of opinion over curriculum in terms of planning, design, implementation, evaluation, and so on, Walker et al (1992) make one basic claim:

Any approach to curriculum development which fails genuinely to acknowledge the plurality of views is doomed to founder. (p.49)

And consequent of which claim the bearing on the work of the educative leaders is:

For reasons of both efficiency and democracy, educative leaders might well be expected to be familiar with the current scope and content of curriculum theory, or at least confident that they can take relevant views into account. (p.49)

Walker et al considering the enormously complex nature of curriculum and traversed by cultural and social considerations make another claim:

As with the plurality of views, any approach to curriculum development and theorizing which fails to acknowledge the complexity of the issues is unlikely to succeed. (p.50)

Concerned that *eclecticism* and *compartmentalisation* may lead to lack of coherence with resultant conflict and the creation of more problems in curriculum development, Walker et al suggest that:

Neither eclecticism nor compartmentalisation is satisfactory, on either efficiency or democratic grounds. (p.50)

Observing that the current strength of curriculum theory lie more in its links with practice than in the intellectual merits, Walker et al point out that:

The interests of educative leadership in curriculum development can be advanced by increasing theoretical sophistication, which enhances rather than conflicts with practicality. (p.51)

What is an 'Educative Curriculum'?

Walker et al (1992, p.51) point out that 'if we are going to insist that leadership be educative, and that this be linked to the role of leaders in the development of the curriculum, then we need some way of judging the educational worth of curricula'.

Walker et al observe that few people still believe that 'we can establish clear and definitive criteria for what counts as educative, which must be applied across all theoretical and practical approaches to curriculum' (p.51) and propose an alternative in recognition that: 'What counts as educative is itself dependent on the theoretical view taken' (p.51). This acknowledges that to determine what might be an educationally worthwhile curriculum requires us to assess relative merits of alternatives, complementing or competing theories in education. This follows that we need a practical set of procedures for judging between competing views (Walker et al, p.52)

Further, an educative leader is also reminded of an important issue that because of the practical nature of curriculum theory, apparently two distinct questions cannot be separated: 'What criteria should be used in planning curriculum, selecting content, and in evaluation?' And 'Who should make decisions about curriculum, using what procedures and in what social structures?' (Walker et al, p.52)

Values in the Curriculum

In order for the educational leaders to play their roles effectively in the curriculum development, educative leaders will need to appreciate the range of value positions that have claims to curriculum and understand at least their major emphasis. Some of the major value

positions, according to Kemmis et al (1983) are: Vocational/neo-classical, Liberal/Progressive, and Socially-Critical. However, Walker et al (1992) have broken them down further and added Religious and Pragmatic orientations on to the list. These are: Neo-classical *(conservation of an authoritative cultural tradition)*, Vocational *(individual survival through employment)*, Liberal-Meritocratic *(personal autonomy and egalitarian freedoms)*, Liberal-Progressive *(personal autonomy in a context of social and cultural harmony)*, Socially-Critical *(social change through educational action)*, Religious *(development of personal beliefs and attitudes in the context of specific moral and practical commitments)*, and Pragmatic *(coherent and mutually productive problem-solving and learning capacities of individuals and social groups)* Walker et al, 1992, pp.53-54).

Walker et al (pp.54-55) point out that each of these value orientations makes certain social and psychological assumptions. They argue that values are neither developed nor put into practice in an empirical or theoretical vacuum. According to them, in the educational context, the crucial links must be with our assumptions about the conditions for learning. Accordingly, Walter et al, taking a pragmatists stand, suggest us to note that:

Both the justification and the practicality of value judgments requires us to render them coherent with, or at least check them out against, our psychological and sociological knowledge, particularly our knowledge of learning. (p.55)

Given the variety of value-orientations and the differences of opinion about how to justify particular value judgments as they arise in curriculum development, we need an approach which achieves the most coherent value package possible within a democratic framework. (p.56)

Learning, Teaching and the Curriculum

Walter et al (1992, p.56) observe that no curriculum development is possible without assumptions about how learning and teaching can and should proceed. They relate this to a huge variety of views on these questions, and a vast amount of research and theorizing that has been published (Bower and Hilgard, 1981 in Walker et al, 1992, p.56). They further note that our approach to learning and teaching will also be influenced by our views on motivation, evaluation, classroom management and the institutional and societal contexts. Walker et al point out that 'whilst the educative leader cannot be expected to be an expert on all aspects of this, it is important to clarify one's own views of teaching and learning and be able to relate them, in curriculum design and implementation, to the views of others' (p.56).

However, while it will be useful to be familiar with some major kinds of view on offer, for want of time and space, herein they will only be named, only to keep them in the view of the educative leader: Behaviourism, Social Learning Theory, Cognitive Theories, Information-Processing, and Learning as Cultural Action.

While the intention is restricted only to naming the learning theories, a thought or two will be discussed within 'Learning as Cultural Action'. Walker et al (1992, p.58) contend that 'curriculum itself is a cultural construction'. They argue that if an open, experimental attitude is adopted to the culture and subcultures of societies, learners in all social positions, including educative leaders, will be enabled to be active inquirers into their social and natural environment. This is argued to 'promote the kinds of adaptation which are

conducive to the development of that human knowledge which is necessary for human progress and even survival' (Piaget, 1978 in Walker, 1992, p.58)

They argue that for a creative and flexible culture, an active and an inquiring learning is required. They further argue that a culture, whether inclined to conservatism or change, is the product of the learning of the individuals whose culture it is.

The curriculum cannot but start with the cultural context as it is; what should be conserved and what should be changed has to be sorted out by cultural action, in which educative leaders, as learners themselves, discover problems and possibilities of educational action through curriculum development (pp.58-59).

Walker et al argue that the process of discovery through cultural action is itself a learning process, through which knowledge is produced and the acquisition of this knowledge becomes critical for leadership in curriculum development. Further, they point out that the knowledge which is selected or developed in the actual, or enacted curriculum has always been recognised as a fundamental issue in curriculum development, suggesting that learning or development of knowledge is also central in the curriculum development.

Curriculum Knowledge

Various epistemologies: Partitionist Theories, Phenomenological Theories, Critical Theory (known as foundational theories), Holism (non-foundational theory), have been influential in contemporary curriculum theory. While other theories will not be discussed, Holism will be glossed over.

Walker et al (1992, p.60) point out that foundationalism faces several severe problems, a major one being the vicious regress of knowledge claims. Holism claims to be non-foundational epistemology, emphasizing coherence among theoretical, empirical and value items. Walker et al's claim can be better appreciated through the following statement:

Our beliefs, or knowledge claims, are justified to the extent that they cohere with each other, meaning how logically consistent or tightly integrated they are with each other. Our knowledge claims, including reports of empirical evidence and personal experience, are judged by the degree to which they cohere with the whole of our current knowledge and with the assumptions underpinning the most effective solutions to out practical problems. Thus we judge theoretical views on education by their internal coherence, their coherence with evidence (including practical experience) and their coherence with the rest of 'our theory of the world'. We judge theories as wholes, and as wholes within a whole 'theory of the world'. (pp.60-61)

Walker et al make two further claims:

The pragmatist holist epistemology is superior to its competitors as an account of the nature of knowledge, methodology and values. Nevertheless, it is not necessary to accept the epistemology in its entirety to see merit in some of the practical research, development and decision-making principles it generates. These may be found useful by people of various epistemological persuasions. (p.64)

Holism, Pragmatism and Curriculum Development

Walker et al (1992, p.64) claim that 'the holistic epistemology supplies both a framework for making decisions about curriculum content and a set of procedures for judging between competing views, whether they concern curriculum, values, knowledge itself, or the desirability of particular decision-making processes and administrative/political structures'. With regards to 'curriculum content' Walker et al make the following claims (pp.64-67).

i) To discover what are the shared and unshared problems in any given situation, we need to conduct a situational analysis.
ii) Educative leaders should take a lead in building a partnership between the schools and the wider educational environment which facilitates frank communication and shared decision making.
iii) A relevant view is defined as a view which addresses the problems arising in a particular situation at a particular level, and therefore has some bearing on the solution of those problems.
iv) Educative leaders should be aware of and capable of responding to the changing balance of relevant considerations, in both their horizontal and vertical relationships in the educational framework.
v) Curriculum knowledge, or knowledge produced in curriculum development, is produced through a search for coherent proposals for action to solve problems. It works through theory competition and touchstone, as does the process of research in any sphere.

In terms of the 'Procedures' Walker et al provide five practical steps to be taken by the educative leader in curriculum development within a pragmatic, holistic model of curriculum development as under (pp.68-69).

i) Find out, through situational analysis, what the relevant people in the situation regard as their problems. The leader's own problems are of course part of this. Identification of perceived problems can be done explicitly, by obtaining written or verbal accounts from people of what is preventing them from obtaining their goals, or implicitly, by observing and interpreting their responses to situations and their more settled practices.
ii) Given their explicit or implicit understanding of what their problems are, how do they see their options for dealing with them? How are they related to their theories and values, their views of learning and knowledge? Can the educative leader find out what participants in the situation think are available and practicable solutions to their problems?
iii) Analyze each account of perceived problems and solutions (or each theory of the situation) and assess the degree of internal coherence in each account. Are there inconsistencies or very loose internal connections in the set of views and practices of the people whose account it is? Our assumptions, of course, is that the greater the coherence, the greater the practical efficacy of the account.
iv) Analyze the relations between these accounts, the different problem-solutions frameworks of participants in the situation, to determine the degree of mutual coherence between them. How do the perceived problems and solutions of one individual or group match up with the perceived problems and solutions of other individuals and groups? Where is the overlap (touchstone) and where is the conflict (theory competition)? How much of each is there and how significant, practically speaking, are they? Since, of course, these are rooted in the practical situation, the analysis for coherence means addressing the issue of culture, harmony, diversity or divergence between the ways of life present in the situation.

v) Work out what options may be available, either derived from or negotiated through touchstone, for tackling the shared and unshared problems of the participants in the situation. To maximise touchstone, it is possible that through further learning and negotiation some participants may come to see hitherto unperceived solutions to their problems or revise their ideas of what their problems are. If so, competition and touchstone will have been reconstructed.

Walker et al (1994, p.71) point out that 'the theoretical perspectives of academic educationists may give conflicting accounts of the causes of teaching-learning phenomena and of the personal and social problems relevant to curriculum development'. These differences in theoretical perspectives, they point out, 'will underpin differences of professional interest in curriculum development insofar as views adopted in practice become more powerful than those ignored' (p.71). Accordingly, they make a few claims in 'judging competing views' in curriculum development for educative leaders:

Educative leaders have a role to play in combating crude and prejudiced representations of competing views.

Educative leaders have to be prepared to make judgments between competing theoretical views and to take responsibility for those practical options which are best suited to the problems within their brief.

Educative leadership means scientific research in action. This is a fundamental contribution to the development of curricular knowledge, which like all knowledge, proceeds and grows by the elimination of error through the trials of practical action. Leadership needs to be experimental. To admit you are wrong and change your mind does not mean you are a failure.

Collaboration in curriculum development

It is clear from the discussions about the nature and principles of organisation of curriculum knowledge that there will need to be decisions about curriculum design, implementation and evaluation taken at various levels, ranging from the national to local and classroom levels. Walker et al (1994, p.73) point out that this puts the curriculum theory as part and parcel of our approach to politics and administration, and therefore the curriculum negotiations must transcend vertically as well as horizontally.

Walker et al point out that the degree of success and coherence achieved in curriculum development is going to depend on the overall situational analysis and vertical and horizontal negotiation at and between all levels. In this regard, an important role they subscribe for educative leaders is:

People with a grasp of the theory, politics and administration of curriculum are required who can stimulate and foster convergence of action at and between levels, which means promoting overall situational analysis as well as horizontal and vertical negotiation. (p.75)

In this section, philosophically justified and practicable approach to educative leadership in curriculum development as proposed by Walker et al (1992) has been glossed through. The following quote from Walker et al (1992) sum up this section:

The educative leader is both a careful thinker and theorist and a practically effective problem solver. The leader, whatever the level at which he or she works, carries out a role requiring cooperation and negotiation, openness to the views of others and the capacity to make confident but revisable decisions. Pragmatism opens up rather than precludes opportunities for serious consideration of values, related to learning and growth of knowledge. The creation of a genuinely educative cultural community, rooted in but transcending the school context, is a challenge for people of vision as well as hard-headed commonsense. The measure of both will be the quality of the curricula developed and implemented in our schools. (p.77)

Conclusion/Recommendations

In section two having made an attempt to understand the concept of leadership through exploration of merits and demerits of various leadership theories, it has been argued that an appropriate leadership in education be *educative*. In that an *educative leadership* is 'concerned with the ways of knowing organisations and ways of leading that find expression in the cultural norms of the group, the educational organisation or the group' (Duignan et al, 1992, p.3). The section concluded with by offering a practical theory of educative leadership.

In section three an attempt has been made to understand the concept of curriculum and its development against a backdrop of various curricular claims. The concept was discussed through the ideas of curriculum and teaching, interpretation of curriculum, contestations in curriculum and curriculum development. It was concluded that, while curriculum as an object has its importance, curriculum is constructed in the interactions between teacher and students during the process of teaching and learning, the pedagogical view.

The final section attempted to establish the crucial roles educative leaders at various levels will have to play in the curriculum development. It was argued that in order to play that role effectively, the educative leader must have a broad understanding of the scope of curriculum theory, values in education, teaching and learning, curriculum knowledge, and how it impacts on matters of curriculum development, the measure of which will be the quality of the curricula developed and implemented in the schools

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Why aren't children in Bhutan reading?

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Children in Bhutan are generally not reading and this has been a concern for many educators and parents in Bhutan. Though there were no studies done on this issue, the concern has been raised in teachers' workshops and during teacher training. As a teacher and a mother, this concern gave rise to a question in my mind, 'why aren't children in Bhutan reading?' To find out the reasons to this perennial question, I carried out a micro study in one of the primary schools in a rural area in 2002. I chose to do this study at the primary level where attitudes about school-based literacy are established and foundation for reading and writing already exists. I focused my study on reading in both the languages taught in Bhutanese schools: Dzongkha, the national language, and English, the semi official language. I did a case study with 100 students of Class V and VI from that particular school. I collected my data using a questionnaire where children simply ticked and wrote brief answers. I also talked informally with some of the students. My study identified four main areas of concern.

1. Lack of motivation

Most reading is done in schools and in the schools it is for academic purposes only. There is no proper motivation given for children to do reading. The only reading for pleasure is once or twice in a month where the teacher brings some books and issues to the children. Children must find their own time to read the books as there is no proper timetable for reading books for information, ideas or simply for pleasure. They get to change the books only after another month. The school organises a so-called Reading Week, in which only the good readers take part for competition. According to the study, many students wanted to participate but only selected ones could take part because of insufficient materials, space and time.

2. Lack of appropriate materials

Most children like to read books with pictures and medium print size. Among the reading materials the comic seems to be the most popular kind of book but in the rural Bhutan, comic books are not available. Children seem to look for the comic section of the national newspaper, the only source that they could get once a week. There are almost no books written in the national language besides the school textbooks, so not much reading can take place in their national language. Children can get some reading materials written in English and they like to read them but these materials are very scarce and scanty in number. Teachers are not able to choose books that appeal to the children, as there is not much reading material available.

3. Lack of modeling

Children do not have role models to look up to and see how reading is done for recreational activity. Teachers have prescribed manuals and syllabuses to follow

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and they are required to meet the deadlines. So reading aloud an enjoyable book of personal choice cannot take place. At home, reading for pleasure hardly ever takes place. Occasionally children see monks reading sophisticated prayer books to grasp the meaning of which is beyond the knowledge of most lay people not schooled in the sacred scriptures.

4. Bhutanese culture and home factors that militate against development of literacy:

Although some Bhutanese do read, the society at large follows an oral culture. People prefer to talk than read. Even in operating machines instead of reading the manuals, 'trial and error' is the common practice of the society. On the other hand, children in rural areas have to attend to a number of regular household chores. Illiterate parents and elders in homes cannot understand the value of reading if it is not connected to school, religion or daily tasks.

This small study has led me to my current interest of finding out more about these four main reasons why children are not reading in Bhutan. I have researched the four factors to give me a greater understanding of this problem so that I can create a strategy to help Bhutanese children enjoy reading and become lifelong readers.

Motivation

'Skill makes reading possibility. Motivation makes a reality' (Colker 2005).
Although many studies done on reading in the 1980's were mainly focused on the cognitive aspects such as word recognition and comprehension, it was only in the 1990's that affective elements of reading were also given equal importance with cognitive aspects of reading. Motivation, in particular, was voiced by many researchers and teachers as their top priority (Colker, 2005: para 1).

A leading researcher, Guthrie (2001), defines readers who are highly motivated as those who 'generate their own literacy learning opportunities, and, in so doing, they begin to determine their own destiny as literacy learners.' Guthrie and other researchers such as Gambrell, Wigfield, Alvermann and Baker agree that reading motivation is the main component of engagement. According to Guthrie (2001) an engaged reader reads for a variety of purposes and uses pre-knowledge to build on new purposes and to be able to socially participate in meaningful interaction involving reading. Motivated readers will look for meaning, have enjoyment in learning and trust their own reading abilities (self-efficacy). Therefore, from the above point of view, motivation is seen as a part of engagement.

Although motivation is found to be multifaceted, three factors influencing motivation are discussed as the main components by Colker (2005).

Self-efficacy

It was found that if a child has a high self-efficacy and sees reading as a challenge, which he can master if he works diligently, there is a relationship to accomplishment of success not only in reading but also in maths.

Interest

Interest in reading opens doors for the reader to get engaged. An interested reader can comprehend difficult materials better compared to a child at a similar level who lacks interest. Hence, interest is based on two factors: attainment value and utility. Attainment value refers to the importance of the task, utility value, the perceived usefulness of the reading task.

Reading challenge

Reading challenge is defined as the satisfaction the reader derives from mastering a complex text. Researchers have found out that the degree of difficulty is tempered by the amount of time it takes to accomplish the goal. Goals, which are challenging at an appropriate level and achievable in a short time, are most likely to be pursued by readers.

There are two types of motivation being discussed among researchers and theorists namely, Intrinsic and Extrinsic motivation.
Intrinsic motivation has been declared as 'our greatest human resource' by educators such as Dewey and Montessori. According to Guthrie (2000 online), intrinsic motivation seems to emerge from the desire and interest that the reader has within him/her.. There is no imposing force from outside for reading. The readers read because of their own interest, to fulfill their curiosity and for their own joy of learning new things. Intrinsic motivation is connected with deep and internalised learning thereby producing lifelong readers. Extrinsic motivation, on the other hand, is based on rewards and social controls. For example, an externally motivated reader reads to complete a course requirement or for recognition and in a competition.

(Gigfield and Schiefele (1998) consider that putting too much focus on social comparison between children, organizing too many competitions and not putting much effort into sparking children's interests in different topics can lead to a decrease in the competence, beliefs, mastery goals, in intrinsic motivation decrease and increase in extrinsic motivation and performance emphasis on performance goals.

While the use of intrinsic motivation is associated with success in reading, extrinsic forms are labeled as shallow and superficial learning. However, current researchers have found out that, extrinsic motivation can be used to bring about intrinsic motivation to read. As Gambrell and Marinak (1997) observed, 'The appropriate use of incentives can lead learners to engage in reading and can lead to the internalisation and integration of the value of reading. When incentives are linked to the desired behavior and promote engagement in the desired behavior, motivation can become self-determined and can foster high-quality learning. Further, appropriate incentives for goal-oriented, challenge reading performance can enhance intrinsic motivation to read'. Cameron and Pierce (1994) suggest that giving extrinsic rewards related to reading and reading behaviors such as books, book marks, teacher praise, helps develop intrinsic motivation for reading.

So having a balanced view of reading that includes emphasis on both affective and cognitive development is worthwhile.

Lack of appropriate reading materials

Many studies show and support the notion that a book-rich classroom environment will increase the motivation levels of the children to read. 'Offer students a print rich environment within which to interact. Engage students with surrounding print as both readers and writers' states (Winch, 2004).

According to Elley (1996), the late 90s the IEA Study of Reading, which was carried out in 32 different countries, had findings relevant to the concerns of developing countries. A clear contrast of classroom libraries was evident when they compared standardised reading tests scores. The scores of the representative students from each country, who also completed questionnaires about their home and school circumstances showed that the high scoring countries reported having more classroom libraries and more books compared to low scoring countries. The size of the school or classroom libraries differentiated education systems that produced high and low literacy scores. In a similar result of a national survey carried out in Fiji and Indonesia, it was found out that not only having large classroom library is enough 'the quality and use of the library is also important' (Elley 1996). It was found out that in most developing countries, the libraries have a majority of textbooks than fiction. The evidence showed that 'ready access to a wide range of books is a key factor in raising literacy levels' Elley(1996). High reading scores were not found in countries that do not contain good school libraries. Therefore, the availability of books is a key factor in reading development.

However according to one of Gambrell's major findings, 'The availability of books is the key factor in reading development' (1996: online) only if children are instructed how to use the books. Although it is obvious that having a book-rich environment has a positive effect on children's reading, studies have shown that what matters most is what is done with the books. Gambrell says that as having a piano in the room will not necessarily make a child pianist and similarly having books available is not sufficient for the development of highly motivated readers. On the other hand, as pianist needs a piano to perform, there should be high quality books and other reading materials for children to become good readers.

Greaney (1996) says that having access to and use of a wide range of self-selected material are associated with acquisition of vocabulary and comprehension skill in addition to development of reading habit. In many developing countries it is not possible to get interesting reading materials in the first language, either locally produced or imported. Also the subject matter and illustrations in many imported books are often unfamiliar to the cultural backgrounds of young readers. (Alemna,1992).

> Supplementary reading materials that meet students' interest are rarely found in classrooms of developing countries. Apart from the general unavailability of funds and high unit cost of books, other factors that contribute to the

> shortage of materials are lack of local booksellers, publishers, and writers of children's literature, and teacher discomfort with students' reading material that is not on an examination or in the curriculum. (Vincent 1996:25)

Gambrell (1996) found out that about 80 percent of children that he interviewed indicated that narrative and information books that they enjoyed most were self-selected from the classroom library. The research supports the notion that the books and stories that children find most interesting are those they have selected for their own reasons and purposes. In a study done by Schiefele (1991), students who were allowed and encouraged to choose their own reading materials spent more effort in learning and understanding the material. 'It appears that opportunities for choice promote students' independence and versatility as readers' (Turner, 1995).

Role models

Gambrell (1996) in his Literacy Motivation Project has focused on the role of motivation in literacy development and on identifying classroom and home practices that encourage children to spend time reading. He found in his interviews with children that they made spontaneous comments about teachers being the motivating influence. To his question, 'Who gets you really excited and interested in reading things?', teachers, parents and peers were frequently mentioned. According to Lundberg & Linnakyla, (1993), teachers who love reading and are avid readers themselves have students who have higher reading achievements than teachers who rarely read.

Although showing a good model during a silent reading is an admirable practice, Gambrell (1996) suggests to be an explicit reader by sharing reading experiences with students and showing how reading can enhance and enrich their lives. For instance, the teacher can look for something worth sharing with the students- 'an exciting or informative paragraph, a description of a character or an interesting turn of a phrase', Gambrell (1996online). Many teachers read small sections from a story book to their class each days, i.e. they serialise the book.

When we as teachers or even as parents share our reading with children, we are showing them how reading enhances our lives. In this way, we demonstrate to our children that reading helps us learn more about the world in which we live, gives us pleasure, increases our vocabulary, and makes us good speakers and writers. Another important reason mentioned is that when we share our personal reading, children learn to see us as real readers. Explicit reading models for our students will help them find out that reading is enjoyable and learning is pleasure, Children will be encouraged to become life long readers. (Gambrell, 1996 online).

'Reading problems are difficult to fix, but very easy to prevent. Prevention happens long before a child starts schools,' says Fox (2004:10), an internationally respected literacy consultant. According to her, parents should start reading aloud to children at home even before they go to school or soon after they go to school. Reading aloud to children at home would greatly contribute to the child's learning to read as paying attention to one or two children at home by the parents is much easier than having a teacher trying to deal with a classroom of non readers. She

strongly believes that 'if every parent understood the huge educational benefits and intense happiness brought by reading aloud to their children, and if every parent – every adult caring for a child –read aloud a minimum of three stories a day to the children in their lives, we could probably wipe out illiteracy within one generation,'(Fox:004:10).

According to her, the foundations for learning to read are laid as soon as the child hears the sound of people talking, tunes of songs, repetition of rhymes and stories. Therefore, if children have not been talked to, sung to or read aloud to from birth, she believes that these children will find school a burden and 'in particular learning to read becomes a major stumbling block rather than a surprising delight', Fox (2004:13).
The benefits of reading aloud and discussing what has been read are stimulating to sharpen children's brains and development ability to concentrate for a longer time in solving problems with logic and subsequently being able to express themselves easily and clearly.

Culture and home factors

As stated by Dede (2005), before they come to school , all children have extensive exposure to popular culture forms such as music, television, movies and games, toys and books. Children also 'use their power of adaptation and improvisation' from a wide range of narrative sources to create meaning for themselves (Dede, 2005). According to Dede, the role of the reader is also known as 'audience theory of communications,' linked to the differential interpretation of a text determined by a reader's background in combination with the evidence within the text (2005).
In some families or cultures, reading is seen as 'work' by both parents and children and thus reading for pleasure hardly takes place.

Many researchers such as Adams (1990) Guthrie & Siefert (1984), Hess & Holloway (1984) and Ingham (1982) emphasised how home can contribute to the development of positive reading habits and attitudes. 'Once the ability to read has been mastered, whether a young person develops the reading habits depends to a great extent on home attitudes and circumstances,' (Gopinathan, 1978; Guthrie & Greaney, 1991; Southgate, Arnold, & Johnson, 1981; Spiegel, 1981). Elley (1994) showed that there is a large positive relationship between the amount of voluntary reading and number of reading materials at home to the reading achievement.

The IEA Reading Literacy Study too found that students whose home language differed from the school language performed less well on the reading tests than those who were tested on their home language (Vincent, 1996). Pennycook (1994) mentions that one of his Hong Kong students who made a shift from Chinese-medium elementary school to English-medium wrote ... 'I had to speak and listen to English in all subjects except Chinese and Chinese History. It was a hard time indeed. Every word looked like a monster, I had to kill them'. Another student wrote: 'Many students find difficulties in learning not due to their inferiority in ability, but the differentiation in their English proficiency. Thus, students are subjected to the hindrance in studying through a second language'. Similarly, in

Bhutan another impediment to get children to read is because the reading materials are available in their second language.

Because reading is primarily a thinking task, readers relate what they draw from the text to what they already know about the topic, about the text of this type and about the context. 'Reading is described as a process of being literate and *bringing meaning from text in a social and cultural context'* (Winch, 2004:12). Both choices of books and access to knowledge and context that surrounds the book, enables children to gain meaning from the text. Therefore, the content of some books, have been criticised for the failure to reflect children's interest (Bunanta, 1993).

Conclusion

After having read many materials on how to get children to read, I have realised that children must learn to love reading to develop reading habits. From an early age, children need to encounter a wide variety of books that entertain, arouse their interest and excite their curiosity. In countries like Bhutan, there are not many books available for pleasure and the only reading materials are the textbooks. Children miss opportunities to read for enjoyment that results in reading impediments. When children's reading skills are under developed and the only reading materials are the textbooks, reading becomes difficult and not enjoyable. The prescribed text books which are difficult for children and the competition based reading programmes might lead to the development of aversion to reading in children. For children who live in a bookless society, in an oral culture where reading is thought as work rather than pleasure, teachers need to think of creating interest among young learners from a very early age with a wide range of books rather than using only pressure to make children read. Success in bringing up a generation of children who will read for pleasure can be fulfilled only when access to books is easy, when children have the choice and time for reading and finally when they are shown the real value and purpose of reading.

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GENDER DIFFERENCES IN MATHEMATICS ACHIEVEMENT: A BHUTANESE PERSPECTIVE

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Abstract

This paper is primarily an attempt to study the perceived difference in performance and achievement in Mathematics between boys and girls in Bhutan, and to find out some factors attributed to it. To investigate the perceived difference over the course of three years, I studied the achievement of students in three different stages of education, i.e. in Classes VI, VIII and X. Gender difference in achievement of Class VI and VIII students was examined by using their mathematics scores in the Annual Examinations of 2002 and 2004 respectively. To investigate the possibility of gender difference in Class X students in 2006, I visited ten randomly-chosen schools to administer a Mathematics Proficiency Test based on the Class IX syllabus, as the students had not yet learnt all of the Class X syllabus during the conduct of the study. The students also filled up a questionnaire on some pertinent issues related to gender difference in mathematics achievement.

With the help of the Independent Samples T-test, I found out that the difference in achievement of boys and girls was not at all significant across all the three years of education. Though there existed a small difference in the way male and female students perceived mathematics, their study timing, their preference for teachers, and the overall difference in achievement was insignificant.

Some of the findings in this study are not necessarily related to gender difference in mathematics. After having found the difference to be insignificant, I chose to look at the achievement of all students in general. A couple of findings and recommendations in relation to Bhutanese students in general would be useful to improve the standard of mathematics in Bhutan.

Background

Mathematics has been regarded as a vehicle to promote scientific perception. It has become a fundamental element in most areas of the modern world apart from its dominant role in the field of science and technology. It equips an individual with tools such as logical reasoning, problem-solving skills, and the ability to think in abstract ways. It is also important in everyday life, in many forms of employment, medicine, economy, environment and development, and in public decision-making.

Ever since the inception of modern education system in the 1960s, Bhutan has appreciated the importance of mathematics. It has been included in the curriculum as a mandatory subject, at least at the Basic Education Level i.e. until Class X, which emphasises that all children are given equal opportunities to learn mathematics.

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The education system in Bhutan also emphasises the primacy of gender equality. The traditional educational system in Bhutan, which was based on the monastic system, restricted most Bhutanese women from being educated. However, more than four decades after the advent of modern education, the enrolment of girls in schools across the country is almost at par with that of boys.

> *There is no evidence of gender preference for school enrolment (page 6). The establishment of Community Primary Schools has helped the enrolment of girls (page 8). The situation of equity in Bhutan is not the lack of awareness in educating children, especially girl child but it is the question of the proximity of the schools. Children, especially girls, are either not enrolled or drop out of schools when the nearest schools are long distance away from home.*
> (Ministry of Education, 2005)

The Education General Statistics (2006) states that the enrolment of girls in primary and secondary education in 2006 was 49 percent and 50 percent respectively. Looking at the girls' enrolment over the last five years, a slow but steady increase towards gender parity is observed (Class VIII in 2004).

However, when the question of differences in achievement arises, there has always been a general consensus among the Bhutanese population that men tend to perform better and achieve higher than their female counterparts, especially in subjects like mathematics. This assumption is, however, not based on any pragmatic research conclusions but perceived due to our traditional societal beliefs and stereotypes that associated women with frailty. Lucy Sells (1973, quoted in Hyde, J.S. et al, 1990) identified mathematics as the 'critical filter' that prevented many women from having access to higher paying and prestigious occupations.
People have realised that gender bias in schools hinders the ability of the school system to enable students develop their personalities and talents to the full potential. But in practice, the educational system may still be influenced by stereotypical gender concepts that widen the gap in achievement levels of boys and girls, especially in mathematics.

Purpose and Significance of the Study

The main purpose of this study is to examine the perceived gender difference in mathematics achievement in relation to students' attitude towards the subject and teachers' influence. The skills and capacities of teachers are viewed as the key elements in promoting child-centred, quality education (Education Sector Strategy, 2003). The study is also expected to highlight the issues like decline in the standard of mathematics of the Bhutanese students and teacher morale, especially that of mathematics teachers.

Since there is no study this kind done, the study is aimed at establishing a benchmark for gender difference in mathematics achievement in Bhutan. This study could be subjected to critical viewpoints.

As the world is making greater advancement in the field of development, we must acknowledge the importance of mathematics. From simple daily calculations to

more sophisticated engineering works, mathematics plays a very significant role. Mathematics is used to communicate information about a wide range of different subjects (Wikipedia.com, online):

- **Mathematics describes the real world**: many areas of mathematics originated with attempts to describe and solve real world phenomena - from measuring farms (geometry) to falling apples (calculus) to gambling (probability). Mathematics is widely used in modern physics and engineering, and has been hugely successful in helping us to understand more about the universe around us from its largest scales (cosmology) to its smallest (quantum mechanics).
- **Mathematics describes abstract structures**: on the other hand, there are areas of pure mathematics which deal with abstract structures, which have no known physical counterparts at all.

Mathematics was useful in some discoveries which now seem so trivial:

> *Mathematics led to the perfect ratios shown in Renaissance painting. The study of astronomy in the early times of its inception demanded the expansion of our understanding of mathematics and made possible such realisations as the size and weight of the earth, our distance from the sun, the fact that we revolve around it, and other discoveries that allowed us to move forward in our body of knowledge without which we would not have any of our modern marvels of technology* (Online).

We are living in the age of IT where we need mathematics to take Bhutan to greater heights of achievement and development. Therefore, it is of utmost importance to acknowledge mathematics and keep the pace of development with the world. Hoang Tuy states:

> *...in a world quickly moving towards the age of information highway, mathematics should be considered a key to development. Every people concerned with the progress of science and the problems the society is facing in the transition to the new era should be aware of the impact that the mathematisation process will have on our life and work in the next century.*

Research Question

Is there a difference in the mathematics achievement of male students and female students in Bhutan?

Gender difference in mathematics achievement has been a topic of research around the world for the last three or four decades. Researchers like Fennema and Hyde have been tirelessly attempting to determine the factors that could bridge the gap. Studies from different places, cultures, and societies show different results favouring both men and women as in the studies of Maccoby and Jacklin (1974) and Alkhateeb, H.M. (2001)

The government's emphasis on gender equality and empowerment of women brought this study into the spotlight. This study will bring out the factors that influence the performance and achievement levels of individuals and reveal those, which can be applied to bridge the gap, if there is any.

This study will ask the following questions related to gender difference:

- Is there a difference in the performance level of male students and female students?
- Is there a difference in the confidence level of male students and females students in mathematics?
- Is there a difference in the effort put in by male students and female students to learn mathematics?
- Is there a difference in the expectations of the teachers from the male students and female students?
- How does the teacher influence student achievement?

LITERATURE REVIEW

There have been a lot of research done on gender difference in academic achievement. However, researchers have reached a consensus on only a handful of findings. Elizabeth Fennema (2000), even after studying for three decades on gender difference and mathematics, decided that 'complexity' best described the phenomenon.

> *Gender differences in learning mathematics are complex; the multiplicity of forces and environments that operate within our society to influence that learning are complex; it is complex to design effective intervention programs; the role that biological factors might or might not play are complex; it is certainly complex to conduct research about gender and mathematics; it is even more complex to interpret research for practitioners.*

The gap in achievement levels in mathematics around the world appears to be evident and in most cases, it is attributed to gender difference. Maccoby and Jacklin (1974, quoted in Hyde, J.S. et al, 1990) concluded that one of the four sex differences that 'were fairly well established' was that 'boys excel in mathematical ability' (p.352). They also noted that there were a few sex differences until about ages 12-13 when 'boys' mathematical skills increase faster than that of girls'' (p.352).], whereas, in the UAE, high school females outperformed males in mathematics achievement (Alkhateeb, H.M., 2001).

Studies have revealed different constructs like mathematics self-efficacy, self-concept or self-perceived skills, which are strongly related to achievement levels in mathematics and a variety of motivational indicators (Skaalvik, 2004). A 'construct' refers to a characteristic or attribute of an individual or an organisation that can be measured or observed and that varies among the people or organisation being studied (Creswell, 2002 quoted in Creswell, 2003). Research indicates that mathematics self-efficacy (Randhawa et al, 1993, quoted in Mwamwenda, 1999) and self-concept (Skaalvik, 2004) was inferior in girls, which affected their mathematics achievement. Charles Shields (1991, quoted in Tencza, T. O., n.d.) claims that females do not obtain the highest level of achievement in mathematics because of their low confidence level and not their ability.

Literatures mentioned above show the existence of gender difference in mathematical achievement levels and some factors related to it but these studies

were conducted on students who are different from the students of Bhutan in many ways. AlkhaTeeb, H. (2001) reported that the difference in mathematics achievement was due to societal influence and not genetic. Therefore, I presume that gender differences in Bhutan may not be in consonance with that of other countries.

Students' Attitudes and Mathematics Achievement

Critical to learning mathematics are beliefs about the usefulness of mathematics and confidence in learning it. Males provided evidence of more confidence in learning mathematics than females because they believed that mathematics would be more helpful to them (Fennema, 2000). There was a strong correlation between students' attitude towards mathematics and their achievement in the subject. Generally, girls have lower expectations for themselves in mathematics than boys and girls believe that they do not have mathematical ability. When girls do poorly in mathematics, they attribute their poor performance to their inability (Stipek et al, 1991 cited in Perez, online).

The study explores the beliefs of third-graders and junior high school students (male and female). It shows that girls' beliefs begin early in their education and persist into junior high school (and probably beyond). Therefore, starting at the elementary school level, teachers need to,1) encourage girls to have higher expectations for themselves in mathematics, 2) offer girls alternative, positive explanations of their mathematics performance.

Teacher's Influence on Student Achievement

As early as in the second grade, both boys and girls express gender stereotyping by describing mathematics as a male domain. By the third grade, females, in comparison with males, rate their competence in mathematics lower - even when they receive the same or better grades. By sixth grade, girls see mathematics as less important and useful to career goals than boys do (Hanson, 1992 cited in Perez, online).

Teacher practice contributes to the continuation or elimination of these patterns. Some of the most commonly cited research studies show that teachers of all grade levels tend to call on boys more often than girls, ask them more complex questions, provide them more analytical feedback, and attribute their success to ability. Teachers more often think girls succeed in mathematics because they try hard. (Grayson and Martin, 1997 cited in Perez, online).

Teachers' expectations can have a direct influence on students' grades, with students who are expected to do well consistently outperforming those who are expected to do poorly (Feldman & Theiss, 1982 cited in Gutbezahl, online). Teachers expect less academic success from girls than from boys and treat girls quite differently from the way boys are treated. Boys are praised for their ability when they do well, and criticised for not working harder when they don't. Girls are complimented on their hard work and neat performance when they succeed in mathematics; they are told they are not bright when they fail (Dweck, 1986 cited in Gutbezahl, online). Boys are also attended to by teachers more than girls, receive more help from teachers on areas in which they have problems, and are called on

more often to give answers in class (Becker, 1981; Fennema & Reyes cited in Gutbezahl, online).
In schools which group students by ability, girls are significantly less likely to be put in high-ability groups, and they are significantly more likely to be mis-assigned than boys (Hallinan & Sorenson, 1987 cited in Gutbezahl, online). Even in the same classroom, the questions asked of girls tend to be at a lower cognitive level than the more conceptual questions asked of boys (Fennema & Reyes, 1981 cited in Gutbezahl, online). These lower-level questions do not provide the opportunity to apply basic mathematical skills to higher-order concepts. Students who have the opportunity to apply skills to higher order concepts themselves (as opposed to simply seeing teachers or peers go through the process) perform better mathematically (Fennema & Peterson cited in Gutbezahl, online).

Thus, teachers expect girls to do poorly in mathematics. Their failures are accepted as a necessary shortcoming of being female, and their successes are discounted. Not surprisingly, girls come to have lower confidence level in their mathematical ability than boys have.

Teachers' expectations and influences determine students' attitude towards mathematics, which are the important factors that determine students' achievement in mathematics.

RESEARCH DESIGN

Participants

The education system in Bhutan adopts a 7-year primary education cycle followed by 6 years of secondary education leading to tertiary education. Basic education level has been defined to include 11 years of free education – primary + 4 years of secondary or till Class X. The main focus of this study is on the basic education level.

A set of three samples comprising Class VI students of 2002, Class VIII students of 2004 and Class X students of 2006, were chosen. This was to identify the pattern of mathematics achievement between the same batches of students at different levels of education. Even though their mathematics scores cannot be strictly compared, we can at least have an idea of the achievement levels at these stages. Based on purposeful sampling, the sample comprised schools from different backgrounds in Bhutan.

A. Class VI students in 2002

Nine schools from across the country were chosen as sample schools from which 677 students (356 boys And 321 girls) out of 9491 students were selected. The sample of Class VI students in 2002 represents 7.13 percent of the total population.

Name of School	Gender		
	Male	***Female***	
Chang Gangkha LSS	48	50	98

Drametse LSS	27	7	34
Kanglung PS	28	39	67
Samdrup Jongkhar MSS	36	36	72
Tsimalakha LSS	50	42	92
Zilukha LSS	51	49	100
Phuntsholing LSS	90	89	179
Sakteng PS	9	2	11
Kangpara PS	17	7	24
Total	356	321	677

The number of students in Class VI in 2002 chosen from different schools as sample

Data from Sakteng PS and Kangpara PS were collected from an old record of my colleague, Mr Needrup Zangpo.

B. Class VIII students in 2004

Mathematics scores of Class VIII students in 2004 was collected from Bhutan Board of Examinations (BBE). Nine schools, representing both urban and rural areas, were randomly chosen as sample schools for data collection. Schools like Drametse LSS and Chang Gangkha LSS, which best represent schools in their location (rural and urban respectively), were chosen based on purposeful sampling.

Name of School	**Gender**		
	Male	**Female**	
Chang Gangkha LSS	50	50	100
Drametse LSS	50	39	89
Shaba MSS	15	13	28
Samdrup Jongkhar MSS	26	36	62
Tsimalakha LSS	39	37	76
Kanglung LSS	29	27	56
Phuntsholing LSS	50	50	100
Damphu LSS	50	44	94
Zhemgang LSS	15	15	30
Total	324	311	635

The number of students in Class VIII in 2004, chosen from different schools as sample

A total of 635 students (324 boys and 311 girls) were chosen from the total population of 7583 students. The sample represents 8.4 percent of the total population.

C. **Class X students in 2006**

Ten schools from across the country, representing both rural and urban locations, were selected as sample schools based on purposeful sampling with the rationale of selecting information-rich cases whose study would illuminate the question under study. The Class X students were randomly selected from these schools.

Name of School	Gender		
	Male	Female	
Shaba MSS	28	36	64
Motithang MSS	26	32	58
Jigme Sherubling HSS	38	35	73
Samdrup Jongkhar MSS	30	35	65
Monggar HSS	41	37	78
Zhemgang HSS	35	36	71
Damphu HSS	38	28	66
Chukha HSS	39	33	72
Darla MSS	56	43	99
Ugyen Dorji HSS	46	55	101
Total	377	370	747

The number of students in Class X in 2006, chosen from different schools as sample

Out of 6856 Class X students, 747 (377 boys and 370) girls were selected as sample. The sample represented 11 percent of the population.

Ten mathematics teachers from the sample schools were interviewed on the different issues affecting the achievement levels of male and female students. The interview was semi-structured. The reliability and validity of the qualitative data collected was verified by within-method data triangulation, in which one examines evidences from various sources and use them to build a coherent justification for themes.

Methodology

Recognising that biases inherent in any single method could be significantly neutralised by Mixed Methods (Creswell, 2003), this study uses both quantitative and qualitative methods. This study consists of an analysis of statistical relationship between students' test-scores which determined the existence of gender difference in achievement and the factors that affected their performance. The qualitative data collected through student questionnaires and teacher interviews were further analysed by within-method data triangulation, which was then used for between-methods data triangulation.

Data Collection

The main tools used in the study were Mathematics Proficiency Test for Class X students, Student Questionnaire, and Teacher Interviews. Mathematics scores of Class VI students in 2002 and Class VIII students in 2004 were collected to look at the achievement of the same batch of students as they moved to upper grade levels.

For the collection of mathematics scores of Class VI students in 2002**,** selected sample schools had to be visited as the administration of the Class VI Examinations had been decentralised to schools in 1999 and schools maintained the examinations results since then. Data could not be collected from some of the schools due to their loss or misplacement.

The mathematics scores of Class VIII students in 2004 were retrieved from Bhutan Board of Examinations (BBE) database. BBE maintains a record of the results for every Class VIII, Class X and Class XII examination. Mathematics scores of the selected students were then transferred to SPSS.

For the present batch of Class X students (in 2006), a mathematics test was administered. Selected schools across the country were visited from May 22, 2006 for the conduct of the test. The maximum score of the test was 25 and the test comprised 25 multiple choice questions. Two sections of Class X students sat the test.

The students also filled out a questionnaire. The questionnaire was divided into two parts: the first part asked the students for their demographic information such as gender, age, etc; the second part included questions related to students' attitude towards mathematics and their perspective on different pedagogical practices of their teachers.
Ten teachers from the ten higher secondary and middle secondary schools were interviewed on the current state of mathematics education in Bhutan. The interviews were tape-recorded.

Data Analysis

This study used two sets of data: quantitative data gathered from the past examinations results of selected Class VI students of 2003, Class VIII students of 2004, and Mathematics Proficiency Test conducted on the Class X students of 2006; qualitative data gathered from questionnaires administered to 747 Class X students who sat the Mathematics Test and teacher interviews.

I examined the difference in mean test-score between genders for Class VI students of 2002 and Class VIII students of 2004. I also examined the differences in mean test-score between genders with respect to schools. Since it was not possible to collect qualitative data from Class VI students of 2002 and Class VIII of 2004, the statistical analysis of the mathematics test-score of those students would reveal only the state of mathematics achievement of the Bhutanese students. Therefore, the magnitude of the difference in mathematics achievement between the genders in 2002 and 2004.

The data were analysed using a computerised statistics package called SPSS. Mathematics scores collected for each year were separately fed to SPSS. I used the independent samples t-test to compare the variance of scores from the mean and to find the significance of the difference in mean test-score between genders.

Limitations

One of the limitations of the test instruments is that no measure of validity and reliability was performed prior to its distribution.

The Mathematics Proficiency Test for Class X students, which was prepared based on my own knowledge of what a Class X student should have learnt, was not pilot-tested.

RESULTS

Although achievements of students in mathematics in 2002, 2004 and 2006 cannot be strictly compared, it would at least show the state of mathematics achievement in the three different stages.

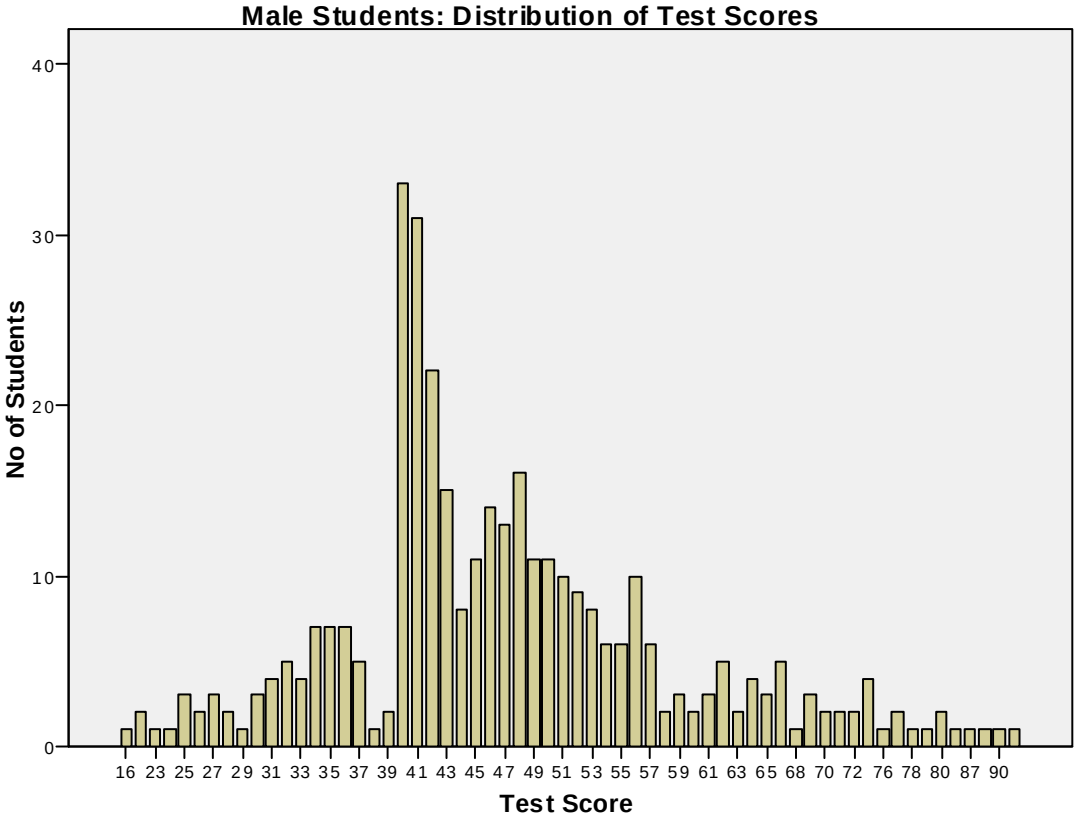
Independent Samples T-test was used to compare the variance and the mean test-scores between genders. A T-test for independent groups is useful when the goal is to compare the difference between means of two groups on the same variable (Weilkiewicz,?).

Class VI in 2002

Mathematics scores are identified as the basis of students' achievement in Mathematics. Therefore, to evaluate the existence of gender difference in Mathematics amongst the Bhutanese students, their achievement in the Final Examinations was compiled for the analysis.

To compare the difference in mean test-scores, Independent Samples T-test was used. Independent Samples T-test calculates the difference between the mean test-scores of two groups, and also the significance of the difference.

The mean test-score of 356 male students was 47.25 and that of 321 female students was 48.07. The difference in mean test-score of the two groups was -0.8 indicating that the mean of female students is slightly higher than that of male students. However, by Independent Samples T-test, this difference was considered insignificant.


Male Students: Distribution of Test Scores
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40
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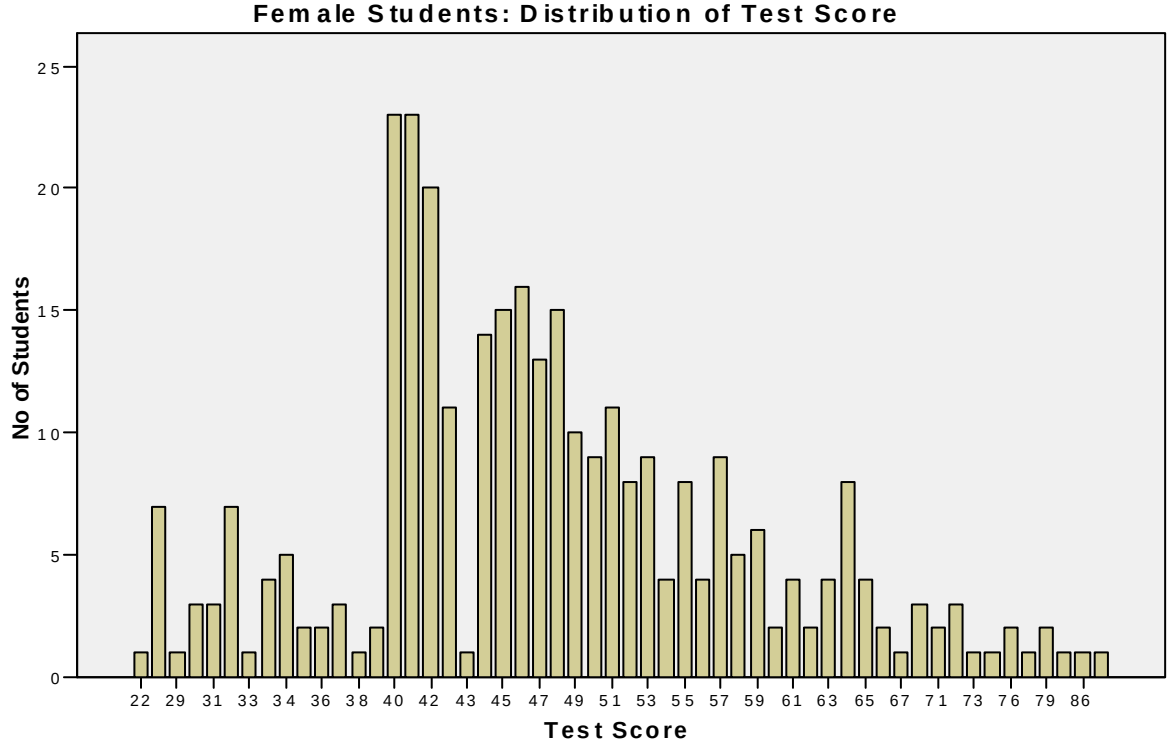
Test Score


Female Students: Distribution of Test Score
No of Students
0
5
10
15
20
25
22 29 31 33 34 36 38 40 42 43 45 47 49 51 53 55 57 59 61 63 65 67 71 73 76 79 86
Test Score

Gender	N	Mean Test-score	Std. Deviation	Std. Error Mean
Male	356	47.25	12.236	.648
Female	321	48.07	10.977	.613
Total	677	47.64	11.654	.448

The table displays the number of cases, mean test-score, standard deviation, and standard error for male and female students

The table above shows that the female students have a lower standard deviation than their male counterparts, which means that more female students have their scores closer to the mean.

Independent Samples t-Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% Confidence Interval of the Difference	
								Lower	Upper
Equal variances assumed	1.668	.197	-.922	675	.357	-.83	.897	-2.588	.935
Equal variances not assumed			-.927	674.984	.354	-.83	.892	-2.579	.925

The table above shows the result of the independent sample t-test. It has two parts: the first, Levene's Test for Equality of Variances is a test to determine the homogeneity of variances of the two independent groups. When the F value is LARGE and Sig. value is less than 0.05, the variances are heterogeneous and when the F value is SMALL and Sig. Value is larger than 0.05, the variances are homogenous; the second part, t-test for Equality of Means, is a test to check the significant difference between the means of the two groups. A low significance value for the t-test (Sig. (2-tailed)), typically less than 0.05, indicates that there is a significant difference between the two groups.

From the above table, the value of F is not very large (1.668) and the value of Sig. greater than 0.05 (0.197). Therefore, the variances of the two groups are homogenous and the data in the first row identified by 'Equal Variances assumed' is used to test the equality of means.

From the second part of the table, a 2-tailed significance value of 0.357, which is greater than 0.05, means that the difference in achievement of male and female students is statistically insignificant.

The 95 percent Confidence Interval of the difference ranges from -2.588 to .935. Note that this interval is small and the difference of zero lies in this interval. Therefore, there is a high chance of the difference being zero.

School Name	*Gender*	*Mean*	*N*	*Std. Deviation*
Chang Gangkha LSS	Male	46.98	48	10.624
	Female	52.24	50	10.241
	Total	49.66	98	10.708
Drametse LSS	Male	42.48	27	3.817
	Female	44.14	7	2.035
	Total	42.82	34	3.563
Kanglung PS	Male	42.96	28	11.007
	Female	41.28	39	6.989
	Total	41.99	67	8.853
Samdrup Jongkhar MSS	Male	52.00	36	12.201
	Female	50.78	36	8.922
	Total	51.39	72	10.630
Zilukha LSS	Male	49.82	51	13.625
	Female	47.53	49	9.113
	Total	48.70	100	11.634
Sakteng PS	Male	51.00	9	7.517
	Female	40.00	2	8.485
	Total	49.00	11	8.497
Kangpara PS	Male	49.35	17	9.905
	Female	47.43	7	6.655
	Total	48.79	24	8.978
Tsimalakha LSS	Male	47.74	50	8.081
	Female	51.64	42	7.596
	Total	49.52	92	8.061
Phuntsholing LSS	Male	45.74	90	15.643
	Female	46.78	89	14.377
	Total	46.26	179	14.994
Total	Male	47.25	356	12.236
	Female	48.07	321	10.977
	Total	47.64	677	11.654

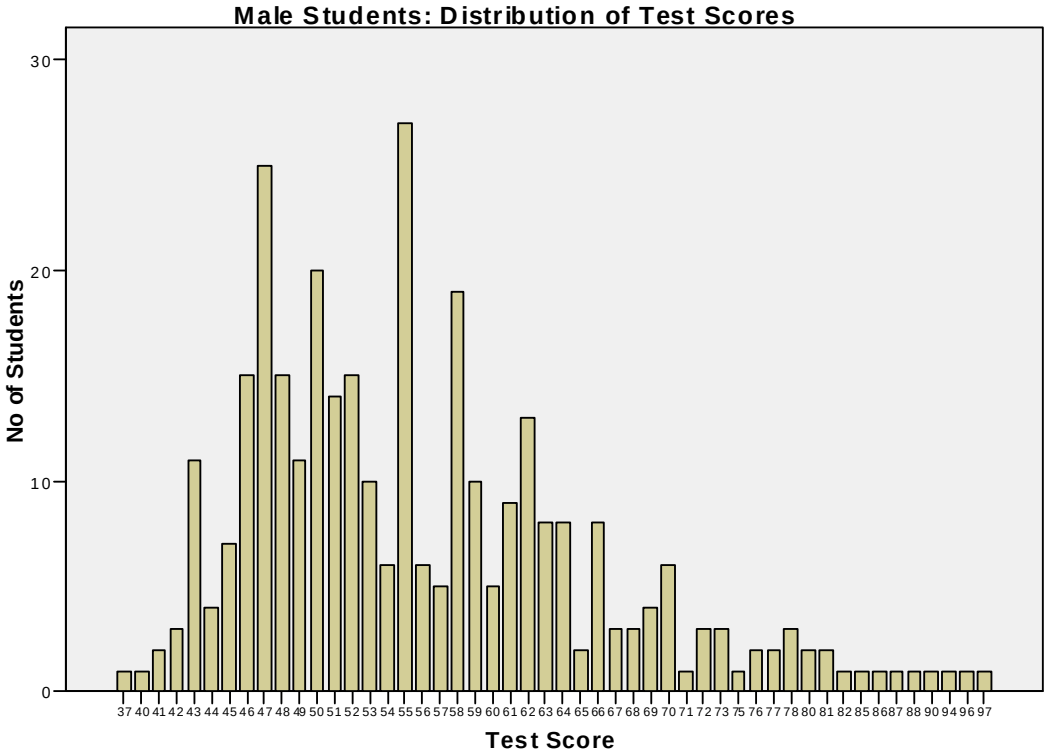
The difference in achievement of male and female students in Class VI Mathematics Examination, 2002 (School based)

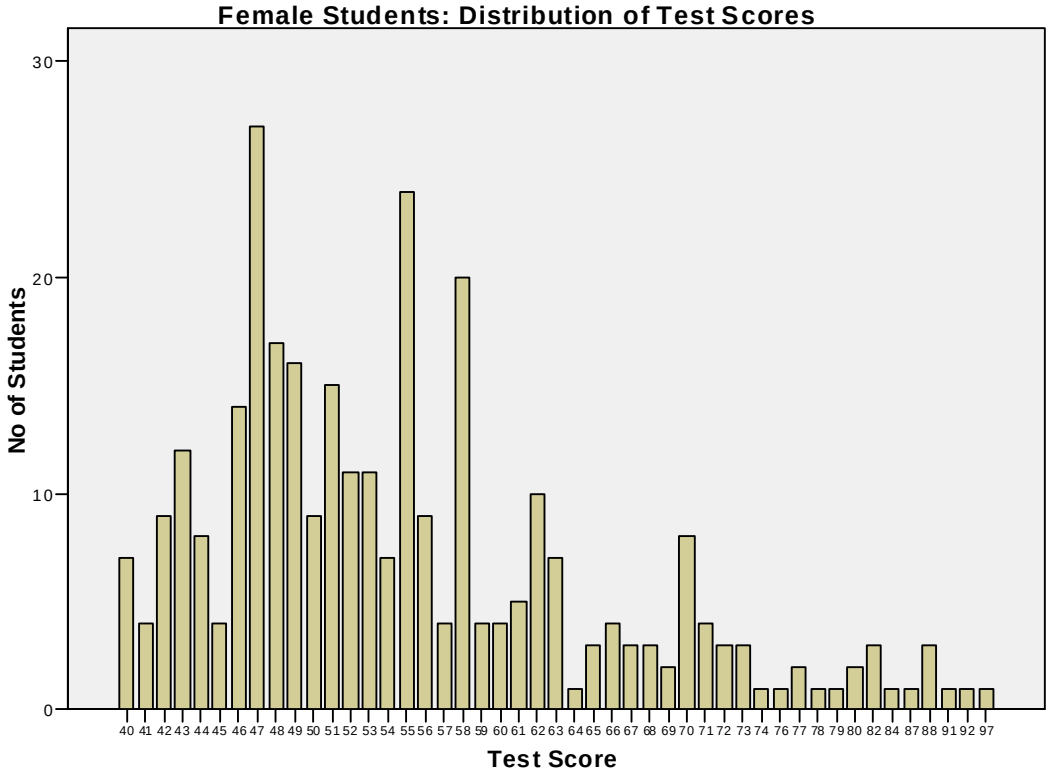
Class VIII in 2004

Mathematics scores of Class VIII students of 2004 were collected to further evaluate the state of Mathematics and find out gender difference in achievement as the students of the same batch move to a higher class level.

Similar Independent Samples T-test was used to compare the mean test-scores of male students and female students in the 2004 Class VIII Common Examinations.

The mean test-score of 324 male students was 56.16 and that of 311 female students was 55.02. The difference in mean test-scores of the two groups was 1.14 in favour of the male students. However, by Independent Samples T-test, this difference in mean test-scores was considered **insignificant**.





Gender	N	Mean Test-score	Std. Deviation	Std. Error Mean
Male	324	56.16	10.395	.577
Female	311	55.02	10.977	.612
Total	635	55.60	11.654	.421

The table displays the number of cases, mean test-score, standard deviation, and standard error for male and female students

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% Confidence Interval of the Difference	
								Lower	Upper
Equal variances assumed	.154	.695	1.357	633	.175	1.14	.841	-.51	2.792

Equal variances not assumed			1.356	629.159	.175	1.14	.841	-.511	2.793

The table above shows the result of the independent sample T-test.

In the above table, the value of F is not very large (.154) and the value of Sig. greater than 0.05 (0.695). Therefore, the variances of the two groups were concluded to be homogenous and the data in the first row identified by 'Equal Variances assumed' was used to test the equality of means.

In the second part of the table, a 2-tailed significance value of 0.175, which is greater than 0.05, indicates that the difference in achievement of male and female students was statistically insignificant.

The 95 percent Confidence Interval of the difference ranges from -.51 to 2.792. Note that this interval is small and the difference of zero lies in this interval. Therefore, there is a high chance of the difference being zero.

Name of School	***Gender***	***Mean***	***N***	***Std. Deviation***
Changangkha LSS	Male	56.18	50	8.131
	Female	60.14	50	12.070
	Total	58.16	100	10.430
Drametse LSS	Male	54.42	50	7.183
	Female	49.38	39	3.668
	Total	52.21	89	6.392
Shaba MSS	Male	48.27	15	4.920
	Female	48.08	13	6.317
	Total	48.18	28	5.505
Samdrupjongkhar MSS	Male	62.27	26	12.758
	Female	61.39	36	10.813
	Total	61.76	62	11.575
Tsimalakha LSS	Male	53.87	39	9.294
	Female	55.35	37	10.833
	Total	54.59	76	10.032
Kanglung LSS	Male	51.86	29	7.420
	Female	48.26	27	6.959
Kanglung LSS	Male	51.86	29	7.420
	Female	48.26	27	6.959

	Total	50.12	56	7.363
Phuentsholing LSS	Male	64.16	50	11.694
	Female	61.30	50	10.290
	Total	62.73	100	11.053
Damphu LSS	Male	55.18	50	11.394
	Female	49.52	44	8.365
	Total	52.53	94	10.431
Zhemgang LSS	Male	50.13	15	4.224
	Female	49.93	15	6.628
	Total	50.03	30	5.461
Total	Male	56.16	324	10.395
	Female	55.02	311	10.788
	Total	55.60	635	10.596

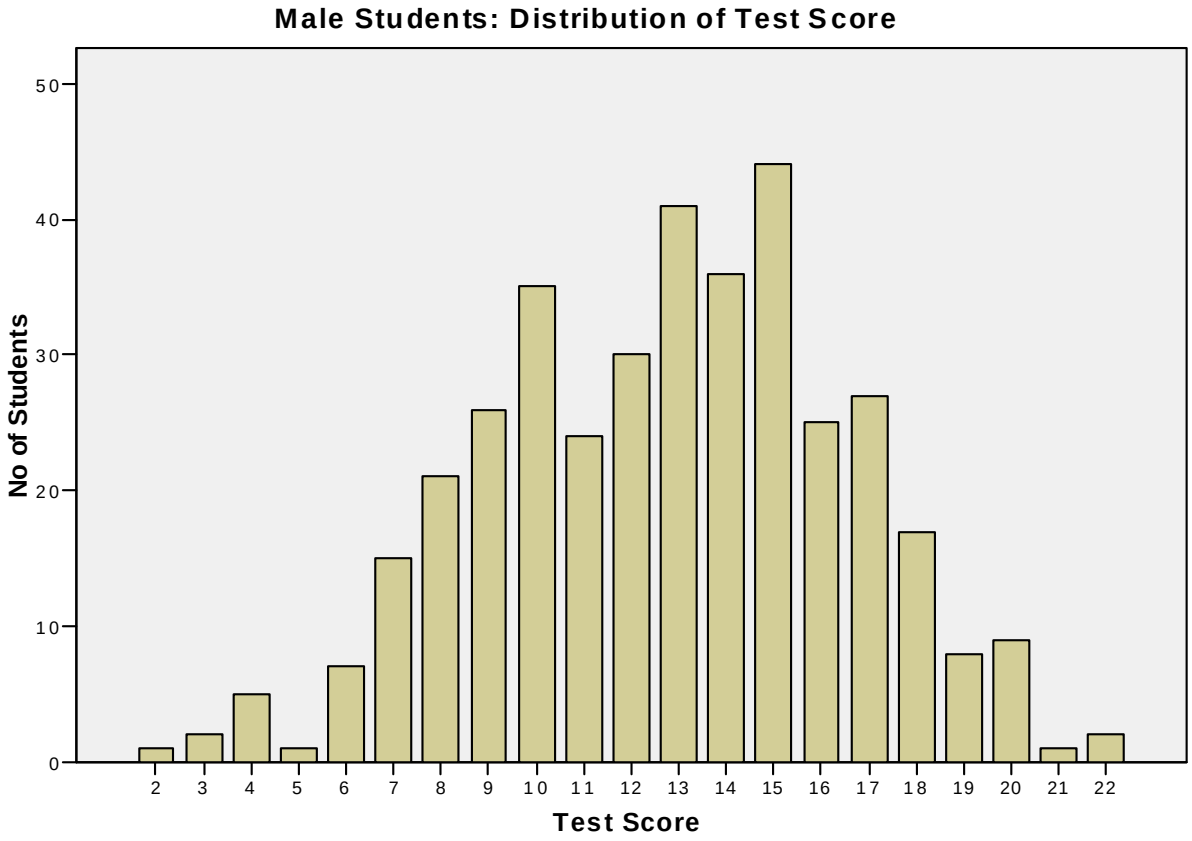
The difference in achievement of male and female students in Class VIII Mathematics Examination, 2002 conducted by BBE (School based)

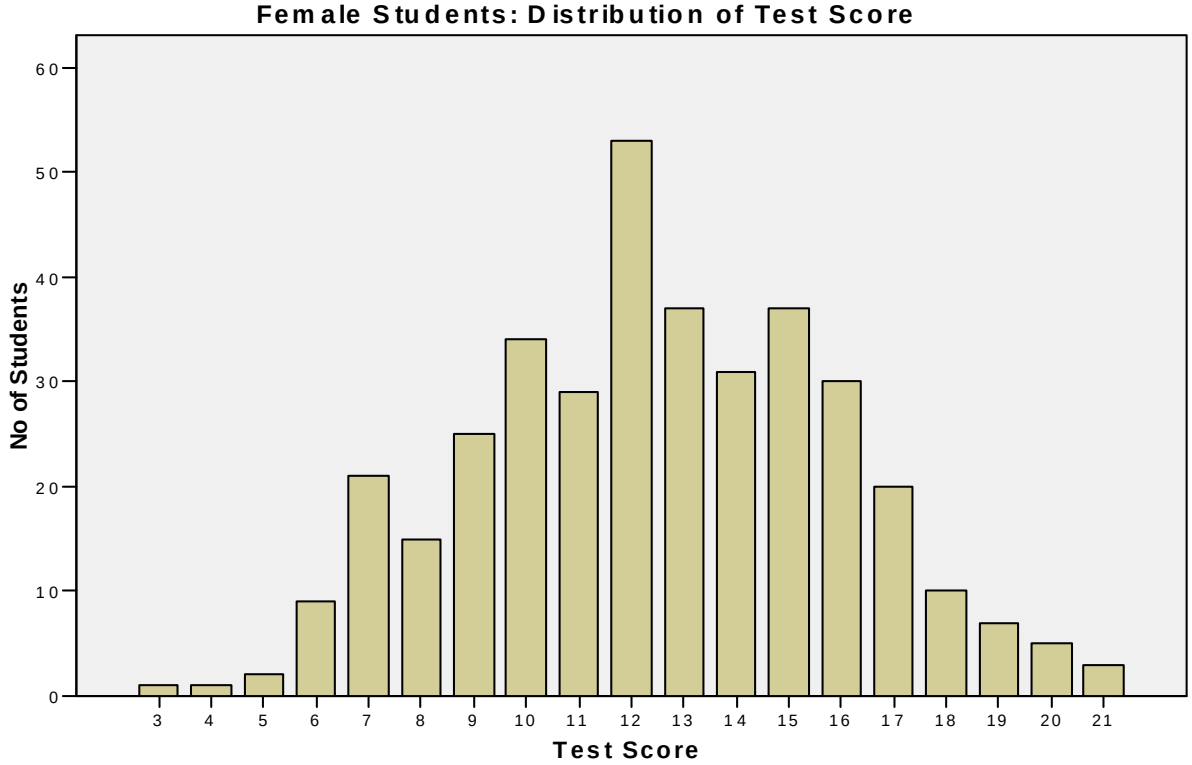
Class X in 2006

The Class X students sat Mathematics Proficiency Test based on the Class IX syllabus. The scores in the test were used to compare the performance of students. The findings were confirmed by emerging themes from the questionnaire they completed.

Independent Samples T-test was used to compare the difference in achievement of male students and female students. The test-scores secured by students were out of 25.

The mean test-score of 377 male students was 12.77 and that of 370 female students was 12.50. The difference in mean test-scores of the two groups was 0.27 in favour of the male students. However, by Independent Samples T-test, this difference in mean test-scores was considered **insignificant.**


Male Students: Distribution of Test Score
No of Students
0
10
20
30
40
50
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22
Test Score


Female Students: Distribution of Test Score
No of Students
0
10
20
30
40
50
60
3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
Test Score

Gender	N	Mean Test-score	Std. Deviation	Std. Error Mean
Male	377	12.77	3.749	.193
Female	370	12.50	3.442	.179
Total	747	12.64	3.6	.132

The table displays the number of cases, mean test-score, standard deviation, and standard error for male and female students

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% Confidence Interval of the Difference	
								Lower	Upper
Equal variances assumed	3.100	0.079	1.042	745	.298	.275	.263	-.243	.792
Equal variances not assumed			1.043	741.707	.297	.275	.263	-.242	.791

In the above table, the value of F is not very large (3.100) and the value of Sig. greater than 0.05 (0.079). Therefore, the variances of the two groups are homogenous and the data in the first row identified by 'Equal Variances assumed' is used to test the equality of means.

In the second part of above table, a 2-tailed significance value of 0.298, which is greater than 0.05, indicates that the difference in achievement of male and female students is statistically insignificant.

The 95 percent Confidence Interval of the difference ranges from -.243 to .792. Note that this interval is very small and the difference of zero lies in this interval. Therefore, there is a high chance of the difference being zero.

Name of School	*Gender*	*Mean*	*N*	*Std. Deviation*
Shaba MSS	Male	13.75	28	3.362
	Female	11.81	36	3.050
	Total	12.66	64	3.310

Motithang MSS	Male	14.31	26	3.403
	Female	13.81	32	3.569
	Total	14.03	58	3.474
Jigmesherubling HSS	Male	14.92	38	3.148
	Female	14.97	35	2.813
	Total	14.95	73	2.972
Samdrupjongkhar MSS	Male	12.93	30	4.118
	Female	12.51	35	3.951
	Total	12.71	65	4.003
Mongar HSS	Male	11.85	41	3.221
	Female	13.54	37	2.824
	Total	12.65	78	3.137
Zhemgang HSS	Male	9.37	35	3.126
	Female	9.83	36	2.933
	Total	9.61	71	3.017
Damphu HSS	Male	15.32	38	2.820
	Female	12.50	28	2.660
	Total	14.12	66	3.071
Chukha HSS	Male	11.62	39	3.911
	Female	11.42	33	2.894
	Total	11.53	72	3.460
Darla MSS	Male	12.30	56	3.536
	Female	13.81	43	3.905
	Total	12.96	99	3.758
Ugyen Dorji HSS	Male	12.28	46	3.318
	Female	11.25	55	2.661
	Total	11.72	101	3.007
Total	Male	12.77	377	3.749
	Female	12.50	370	3.442
	Total	12.64	747	3.600

The difference in achievement of male and female students in the mathematics proficiency test.

Estimation of the population mean

A Confidence Interval of the mean of test-scores for the total population can be estimated from the mean of the sample by using the standard error of mean, which is given by the formula:

$$S_{\bar{X}} = \frac{S}{\sqrt{N}}$$

Where $S_{\bar{X}}$ = the standard error of mean

S = the standard deviation of individual scores

N = the size of the sample

In the formula, sample size and sampling error are negatively correlated, i.e. when the size of the sample increases, the magnitude of the error decreases, and vice versa. It may be generalised that, as the number of independent observations increases, the error involved in generalising from sample values to population values decreases and accuracy of prediction increases.
A particular mean calculated from a randomly selected sample can be related to the population mean in the same way as an individual's score is related to the mean. The chances are approximately 95 out of 100 that the sample mean will not be more than (1.96) X $S_{\bar{X}}$ from the population (I have used only the 95percent Confidence Interval).

To find the 95 percent Confidence Interval of the population mean, the standard error of mean is multiplied by 1.96 and the result is added to and subtracted from the sample mean.

Class VI 2002
Estimation of mean of test-scores of male population
Mean of test-score = 47.25
Standard error of mean = 0.648

95% CI = 47.25 $\pm$ (1.96) X 0.648
= 47.25 $\pm$ 1.27008
Therefore, the 95percent Confidence Interval of the population mean is between 45.97and 48.52.
We could say that 95 times out of 100, we would be correct in stating that the mean of the male population is between 45.97and 48.52.

Estimation of mean of test-scores of female population
Mean of test-score = 48.07
Standard error of mean = 0.613

95% CI = 48.07 $\pm$ (1.96) X 0.613
= 48.07 $\pm$ 1.20148
Therefore, the 95percent Confidence Interval of the population mean is between 46.87 and 49.27.
We could say that 95 times out of 100, we would be correct in stating that the mean of the female population is between 46.87 and 49.27.

CLASS VIII 2004
Estimation of mean of test-scores of male population
Mean of test-score = 56.16
Standard error of mean = 0.577

95% CI = 56.16 $\pm$ (1.96) X 0.577
= 56.16 $\pm$ 1.13092

Therefore, the 95 percent Confidence Interval of the population mean is between 55.03 and 57.29.
We could say that 95 times out of 100, we would be correct in stating that the mean of the male population is between 55.03 and 57.29.

Estimation of mean of test-scores of female population
Mean of test-score = 55.02
Standard error of mean = 0.612

95% CI = 55.02 $\pm$ (1.96) X 0.612
= 55.02 $\pm$ 1.19952
Therefore, the 95 percent Confidence Interval of the population mean is between 53.82 and 56.21.
We could say that 95 times out of 100, we would be correct in stating that the mean of the female population is between 53.82 and 56.21.
C**LASS X 2006**
Estimation of mean of test-scores of male population
Mean of test-score = 12.77
Standard error of mean = 0.193

95% CI = 12.77 $\pm$ (1.96) X 0.193
= 12.77 $\pm$ 0.37828
Therefore, the 95 percent Confidence Interval of the population mean is between 12.39 and 13.15.
We could say that 95 times out of 100 we would be correct in stating that the mean of the male population is between 12.39 and 13.15.

Estimation of mean of test-scores of female population
Mean of test-score = 12.5
Standard error of mean = 0.179

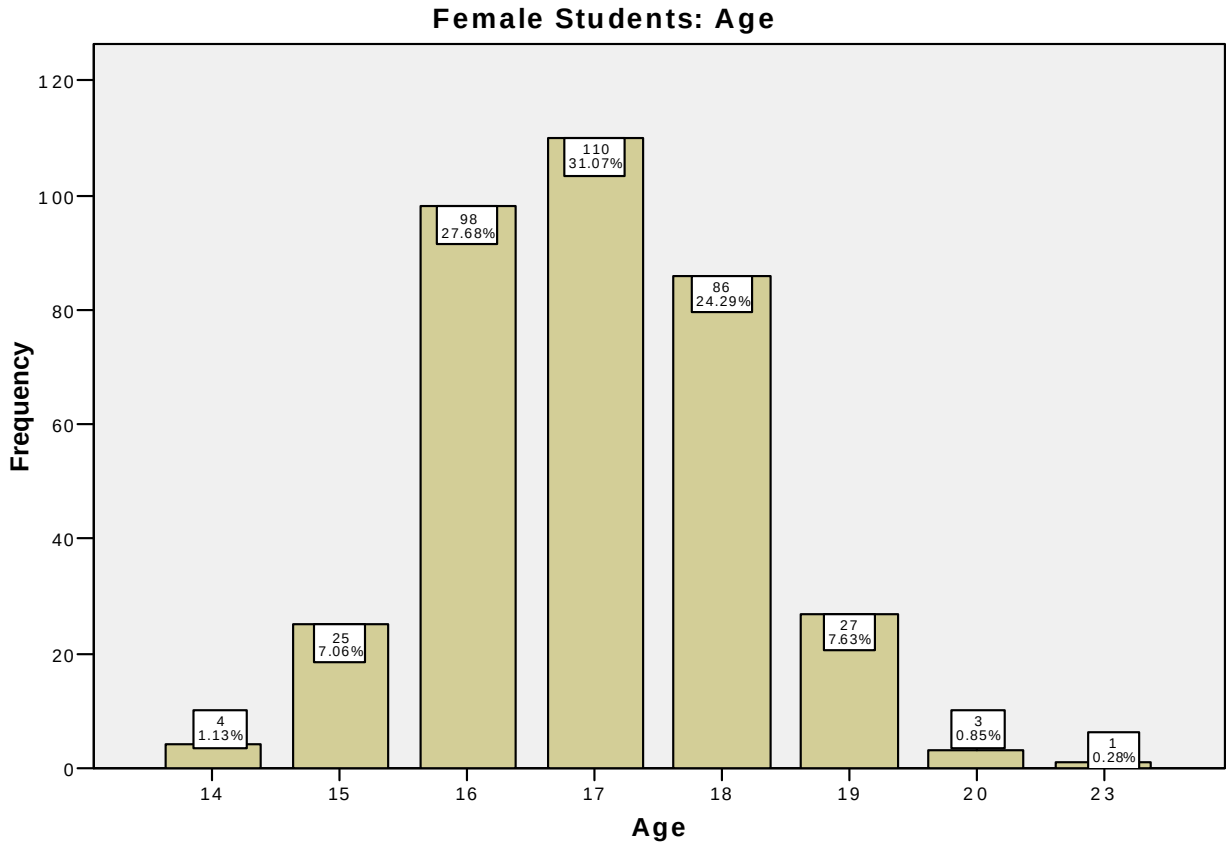
95% CI = 12.5 $\pm$ (1.96) X 0.179
= 12.5 $\pm$ 0.35084
Therefore, the 95 percent Confidence Interval of the population mean is between 12.15 and 12.85.
We could say that 95 times out of 100 we would be correct in stating that the mean of the female population is between 12.15 and 12.85.
FINDINGS

Age

Gender	***Mean***	***N***	***Std. Deviation***
Male	17.62	361	1.423
Female	16.99	354	1.179
Total	17.30	715	1.345

The table above shows the mean age of 715 out of 747 students (361 male and 354 female students) who took part in the test. The mean age of both age groups exceed

the actual expected age of 16. The Basic Education in Bhutan starts at the age of 6 (Education Sector strategy, 2003).



The sample comprised only 64 male students and 98 female students whose age was 16 years, 20 male and 29 female students who were below 16 years of age, and there were 277 male students and 227 female students older than 16 years. The oldest male and female students were 25 and 23 years old respectively while the youngest was 14 years old.

The age group of students in Class X has been found to be inconsistent, and more students are older than expected.

Factors Affecting Achievement

Students Attitude towards the Subject

Gender	*I Like Mathematics*	*Mean*	*N*	*Minimum*	*Maximum*
	Strongly Agree	14.25	129	6	22
	Agree	12.46	176	2	21
	Uncertain	10.81	37	3	17
	Disagree	10.83	23	6	18
	Strongly Disagree	11.50	10	7	16
	Total	12.79	375	2	22
	Strongly Agree	13.28	124	6	21
	Agree	12.07	174	3	21
	Uncertain	12.28	36	6	20
	Disagree	11.80	25	6	19
	Strongly Disagree	12.44	9	9	16
	Total	12.49	368	3	21
	Strongly Agree	13.77	253	6	22
	Agree	12.27	350	2	21
	Uncertain	11.53	73	3	20
	Disagree	11.33	48	6	19
	Strongly Disagree	11.95	19	7	16
	Total	12.64	743	2	22

The above table shows the response of students to the question: I like Mathematics.

From the above table, we can easily see that both male students and female students have almost the same attitude towards the subject: Out of 747 students, 743 students (375 male students and 368 female students) have responded to this question. 129 male students and 124 female students **Strongly Agree** that they liked the subject; 176 male students and 174 female students **Agree** that they like the subject. Only a few students said that they disliked the subject. The number of

male students and female students who agreed or disagreed that they liked the subject was almost the same.

Student interest in the subject seems to have an impact on their achievement. Although the difference in achievement of students is small, the students who Strongly Agree and Agree that they like mathematics seem to score higher than those whose Disagree and Strongly Disagree, except in the case of female students (see the table above).

Gender			Maths As Profession					
			Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree	
Male		Strongly Agree	52	40	22	4	5	123
		Agree	16	65	44	33	15	173
		Uncertain	1	6	14	12	4	37
		Disagree	0	0	2	12	9	23
		Strongly Disagree	0	0	2	3	5	10
	Total		69	111	84	64	38	366
Female		Strongly Agree	44	42	20	9	6	121
		Agree	14	47	54	37	15	167
		Uncertain	0	7	11	10	6	34
		Disagree	1	2	2	13	7	25
		Strongly Disagree	1	1	0	2	5	9
	Total		60	99	87	71	39	356

There seems to be a strong correlation between students' interest in mathematics and their aspirations to take up the subject for profession. There were some students who liked mathematics but did not wish to take it up for profession. More male students liked mathematics and wished to take it up for their profession.

Gender			Mathematics is Fun					
			Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree	
Male		Strongly Agree	19	19	9	33	44	124
		Agree	23	32	23	54	44	176

		Uncertain	5	5	6	12	9	37
		Disagree	3	7	0	7	6	23
		Strongly Disagree	1	3	1	2	3	10
	Total		51	66	39	108	106	370
Female		***Strongly Agree***	15	18	17	26	46	122
		Agree	22	27	22	47	51	169
		Uncertain	3	6	5	5	16	35
		Disagree	3	5	3	8	6	25
		Strongly Disagree	1	3	1	1	3	9
	Total		44	59	48	87	122	360

In the table above, some students who liked mathematics (both boys and girls) did not think that mathematics was fun. In fact, most students did not consider learning mathematics fun, but somehow they liked mathematics. It is not clear as to why they liked mathematics, if they did not think it was fun learning it.

Gender			***Remove mathematics from the curriculum***					
			Strongly Agree	***Agree***	***Uncertain***	***Disagree***	***Strongly Disagree***	
Male		***Strongly Agree***	1	2	4	20	97	124
		Agree	6	6	10	42	110	174
		Uncertain	1	2	5	10	19	37
		Disagree	4	3	2	6	8	23
		Strongly Disagree	1	0	3	2	4	10
	Total		13	13	24	80	238	368
Female		***Strongly Agree***	3	4	8	27	79	121
		Agree	6	9	12	37	106	170
		Uncertain	2	4	7	7	14	34
		Disagree	3	5	4	4	9	25
		Strongly Disagree	2	2	1	2	2	9
	Total		16	24	32	77	210	359

More female students **Strongly Agree** or **Agree** that mathematics should be removed from the curriculum (40 female students and 26 male students) although

this number is very low compared to the number of students who like mathematics and think that it should not be removed from the curriculum.

		Gender		
		Male	Female	
Need to study Mathematics	Strongly Agree	232	252	484
	Agree	103	83	186
	Uncertain	16	14	30
	Disagree	6	8	14
	Strongly Disagree	11	8	19
Total		368	365	733

The difference in number of students who felt that they needed to study mathematics was almost the same.

		Gender		
		Male	Female	
Mathematics is important for the development of Bhutan	Strongly Agree	191	184	375
	Agree	117	127	244
	Uncertain	32	25	57
	Disagree	23	21	44
	Strongly Disagree	6	4	10
Total		369	361	730

The number of students who felt that mathematics was important for the development of the country was almost the same too.

Gender	Rate Yourself in Primary School	Mean	N	Std. Deviation
Male	Very Good	13.23	66	3.628
	Good	12.65	141	4.139
	Satisfactory	13.14	84	3.227
	Poor	11.58	59	3.450
	Very Poor	13.36	22	3.416
	Total	12.74	372	3.734
	Very Good	12.59	64	3.327
	Good	12.59	146	3.192

Female	***Satisfactory***	12.48	82	3.546
	Poor	12.10	49	4.001
	Very Poor	11.80	25	3.279
	Total	12.45	366	3.408

When asked to rate their performance in mathematics when they were in Primary School, the responses of female students and male students were almost the same: 66 male students and 64 female students said they were Very Good, 141 male students and 146 female students said they were Good, 84 male students and 82 female students were Satisfactory, 59 male students and 49 female students said they were Poor, and 22 male students and 25 female students said they were Very Poor.

There seemed to be not much difference in achievement based on how they rated themselves when they were in primary school.

Gender	***Rate Yourself in Mathematics Now***	***Mean***	***N***	***Std. Deviation***
Male	***Very Good***	14.87	30	3.875
	Good	14.12	131	3.344
	Satisfactory	12.68	111	3.194
	Poor	10.74	69	3.284
	Very Poor	9.47	30	3.298
	Total	12.74	371	3.692
Female	***Very Good***	14.67	12	3.420
	Good	13.16	107	3.288
	Satisfactory	12.34	111	3.748
	Poor	11.84	108	3.042
	Very Poor	11.43	23	3.259
	Total	12.45	361	3.424

When asked to rate themselves in mathematics now, male students were more confident than their female counterparts: 30 male students and 12 female students said they were Very Good, 131 male students and 107 female students said they were Good, 111 male students and 111 female students were Satisfactory, 69 male students and 108 female students said they were Poor, and 30 male students and 23 female students said they were Very Poor.

The achievement of students was in relation to their confidence in mathematics. Students who said that they were Very Good and Good in mathematics secured high scores, and those who said they were either Poor or Very Poor in mathematics secured comparatively lower scores.

	Gender		
	Male	***Female***	

Best liked subject	***English***	42	81	123
	Dzongkha	82	94	176
	Mathematics	80	62	142
	Geography	22	17	39
	History	5	12	17
	Chemistry	9	6	15
	Physics	18	4	22
	Biology	63	47	110
	Computer Science	8	1	9
	Economics	14	15	29
	Other	32	19	51
Total		375	358	733

The table above shows responses of students to the question of their best-liked subject.

From the table above, it is clear that most students liked mathematics. The number of students who liked mathematics was 142 (Second after 176 students who liked Dzongkha). More male students liked mathematics (80 and 62 respectively). For the male students, it was the second best-liked subject after Dzongkha, and in the case of female students, it was the third best-liked subject after Dzongkha and English.

		Gender		
		Male	***Female***	
Least liked subject	***English***	19	11	30
	Dzongkha	29	33	62
	Mathematics	70	60	130
	Geography	22	20	42
	History	64	44	108
	Chemistry	104	131	235
	Physics	21	28	49
	Biology	8	12	20
	Computer Science	1	0	1
	Economics	5	1	6
	Other	17	15	32
Total		360	355	715

The table above shows responses of students to the question of their least-favourite subject.

From the table above, it is clear that a total of 130 students (70 male and 60 female students) said that mathematics was their least-favourite subject (Second after 235 students who disliked Chemistry). More male students disliked mathematics (70 and 60 respectively).

Gender	Best Liked Subject	Mean	N	Std. Deviation
Male	English	10.90	42	3.106
	Dzongkha	12.02	82	3.641
	Mathematics	14.96	80	3.132
	Geography	10.95	22	2.516
	History	10.00	5	4.472
	Chemistry	13.11	9	4.540
	Physics	14.72	18	3.495
	Biology	13.08	63	3.557
	Computer Science	15.38	8	4.565
	Economics	11.71	14	3.518
	Other	11.53	32	3.869
	Total	12.79	375	3.753
Female	English	11.65	81	3.518
	Dzongkha	11.78	94	3.605
	Mathematics	13.69	62	3.232
	Geography	13.35	17	3.534
	History	11.92	12	2.644
	Chemistry	16.50	6	3.937
	Physics	12.00	4	4.243
	Biology	13.11	47	3.059
	Computer Science	16.00	1	.
	Economics	11.07	15	3.035
	Other	13.21	19	2.123
	Total	12.47	358	3.456

In the cross-tabulation of students' liking for the subject and their score, male students who considered Mathematics as their best-liked subject secured higher marks whereas in the case of female students, there is not much correlation.

Gender	Least Liked Subject	Mean	N	Std. Deviation
Male	English	14.00	19	3.986
	Dzongkha	14.03	29	3.923
	Mathematics	11.19	70	3.376
	Geography	13.86	22	4.155
	History	14.25	64	3.550
	Chemistry	12.13	104	3.851
	Physics	12.05	21	2.872
	Biology	13.13	8	2.100
	Computer Science	12.00	1	.
	Economics	14.80	5	1.924

	Other	12.35	17	4.227
	Total	12.74	360	3.799
Female	***English***	12.55	11	2.622
	Dzongkha	12.67	33	3.479
	Mathematics	11.52	60	3.181
	Geography	12.90	20	3.655
	History	13.82	44	3.308
	Chemistry	12.05	131	3.411
	Physics	12.25	28	3.658
	Biology	12.67	12	3.551
	Economics	18.00	1	.
	Other	14.33	15	3.958
	Total	12.45	355	3.467

In the above table, students who considered mathematics to be their Least-Liked subject secured the least scores. In this case, female students who considered mathematics to be their Least-Liked Subject secured a slightly higher score than their male counterparts (female students secured 11.52 and male students, 11.19).

Teacher Influence on Student Achievement

Gender	***I Like My Teacher***	***Mean***	***N***	***Std. Deviation***
Male	***Strongly Agree***	13.11	193	3.716
	Agree	12.78	145	3.825
	Uncertain	11.29	17	3.037
	Disagree	10.63	8	3.701
	Strongly Disagree	11.00	11	3.688
	Total	12.78	374	3.758
	Strongly Agree	12.41	190	3.446
	Agree	12.50	151	3.425
	Uncertain	14.64	14	3.249
	Disagree	10.73	11	3.409
	Strongly Disagree	13.50	2	2.121
	Total	12.49	368	3.448
Female	***Strongly Agree***	12.76	383	3.597
	Agree	12.64	296	3.623
	Uncertain	12.81	31	3.516

Disagree	10.68	19	3.433
Strongly Disagree	11.38	13	3.548
Total	12.64	742	3.608

The table above shows the response to the statement: I like my Mathematics Teacher.

Most of the students, both boys and girls, like their teachers: out of 742 students (374 male students and 368 female students), 193 male students and 190 female students **Strongly Agree** that they like their teachers, 145 male students and 151 female students **Agree** that they like their teachers. Only a few students dislike their teachers (19 Disagree and 13 Strongly Disagree).

There is a correlation between students' liking for their teacher and their achievement in mathematics. Ironically, in the case of female students, those who declared their strong dislike for the subject scored higher than most students who expressed their liking for mathematics.

Gender			***I Like My Teacher***					
			Strongly Agree	***Agree***	***Uncertain***	***Disagree***	***Strongly Disagree***	
	Male	***Strongly Agree***	**76**	**43**	5	0	4	128
		Agree	**94**	**71**	6	2	3	176
		Uncertain	9	21	2	3	2	37
		Disagree	9	6	4	2	2	23
		Strongly Disagree	5	4	0	1	0	10
	Total		193	145	17	8	11	374
	Female	***Strongly Agree***	**69**	**48**	3	3	1	124
		Agree	**101**	**67**	4	2	0	174
		Uncertain	12	21	2	1	0	36
		Disagree	7	10	4	4	0	25
		Strongly Disagree	1	5	1	1	1	9
	Total		190	151	14	11	2	368

It is understood from the table above that there is a strong correlation between students' interest in mathematics and their liking for their teacher. There are only a few students who either dislike the subject or the teacher or both. Most responses from the students centred around liking both their teacher and the subject.

Gender		Strict Teacher					
		Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree	
Male	Strongly Agree	19	43	22	29	14	127
	Agree	29	45	34	57	8	173
	Uncertain	3	9	8	12	5	37
	Disagree	5	9	2	4	3	23
	Strongly Disagree	1	3	1	5	0	10
	Total	57	109	67	107	30	370
Female	Strongly Agree	15	41	21	27	19	123
	Agree	28	57	34	44	10	173
	Uncertain	7	9	4	9	7	36
	Disagree	2	12	5	5	1	25
	Strongly Disagree	1	3	1	4	0	9
	Total	53	122	65	89	37	366

Students' interest in mathematics, regardless of gender, doe not depend on the strictness of their teacher. Most of the students who think that their teacher is strict still like mathematics. Both girls and boys seem to have similar preference for teachers and attitude towards mathematics. However, more female students found their teacher strict.

Male		I Like My Teacher					
		Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree	
Male	Strongly Agree	35	16	2	2	2	57
	Agree	64	40	2	0	3	109
	Uncertain	36	25	4	1	1	67

		Disagree	40	55	5	5	2	107
		Strongly Disagree	16	7	4	0	3	30
	Total		191	143	17	8	11	370
Female		***Strongly Agree***	29	18	2	3	1	53
		Agree	71	46	1	4	0	122
		Uncertain	33	26	5	0	1	65
		Disagree	37	46	5	1	0	89
		Strongly Disagree	18	15	1	3	0	37
	Total		188	151	14	11	2	366

Students like their teachers no matter how strict there are. In the table above, we can see that no matter how strict the teacher is, students **Strongly Agree** or **Agree** that they like him or her.

	How does the teacher explain Mathematics concepts					
	Lectures	***Classroom discussions/activities***	***Group Presentations***	***Solving examples from the text***	***Others***	
Male	30	218	7	77	34	366
Female	20	234	14	61	31	360
Total	50	452	21	138	65	726

The mathematics teachers used all the teaching strategies mentioned in the above table. Response to what teaching methods their teachers used is diverse: teachers taught mathematics with more emphasis on classroom discussions and activities (452 students). They also used solving examples from the text as a method of delivery (138 students). Group Presentations is the method least used (21 students).

	Method of explanation you prefer					
	Lectures	***Classroom discussions/activities***	***Group Presentations***	***Solving examples from the text***	***Others***	
Male	5	239	29	68	29	370

Female	8	242	18	75	18	361
Total	13	481	47	143	47	731

The students' preference for teaching methods is almost the same as what their teachers actually use, except for Group Presentations and Lectures. Students prefer Group Presentations to Lectures: There are only 15 students who prefer Lectures as a method of delivery and 47 students who prefer Group Presentations. Classroom Discussions and Activities, and Solving Examples from the Text topped the priority methods of delivery (481 and 143 respectively).

Problems in Mathematics

		Gender		
		Male	***Female***	
Kinds of problems faced	***Failing to recollect formulae***	70	66	136
	Failing to understand the questions	147	161	308
	Don't know which method to use (Concept)	121	119	240
	I don't have any problems	13	5	18
	Other	22	14	36
Total		373	365	738

The table above shows the kinds of problems faced by students in learning mathematics. It indicates that most of students, both male and female, failed to understand questions: 147 male and 167 female students. The students also failed to comprehend the concept of mathematics problems: 121 male students and 119 female students. Failure to recollect formulae while solving mathematics problems was also a problem: 70 male students and 66 female students.

There were some students who do not face any problems while learning mathematics: 13 male students and 5 female students.

Gender	***With whom are problems discussed?***	***Mean***	***N***	***Std. Deviation***
Male	***Parents***	13.00	3	2.646
	Teachers	13.44	111	3.893
	Friends	12.16	195	3.668
	I Work Alone	13.50	56	3.588
	Other	12.67	9	3.775
	Total	12.76	374	3.757
	Parents	12.71	7	3.251

Female	***Teachers***	12.99	109	3.780
	Friends	12.19	199	3.161
	I Work Alone	12.71	45	3.958
	Other	12.22	9	2.438
	Total	12.50	369	3.446

Most students prefer to discuss problems with their friends (195 male students and 199 females). The second highest number of students asks their teachers for help (111 male and 109 female students). There are some students who persistently work alone on problems in mathematics (56 male and 45 females). Lastly, a very small number of students asks their parents for help.

The group of students who prefer to discuss problems with friends secured the lowest marks (males students scored 12.16 and female students scored 12.19). The students who discussed problems with their teachers secured the highest score (male students scored 13.44 and female students scored 12.99). Although this difference in achievement of the two groups is very small, it is a very important finding which could help build strong interactions between students.

Gender	***Reading time for Mathematics***	***Mean***	***N***	***Std. Deviation***
Male	***Nil***	11.75	24	3.234
	Less Than One Hour	12.69	122	3.768
	One Hour	12.60	133	3.896
	Two Hours	13.44	62	3.638
	More Than Two Hours	13.34	35	3.564
	Total	12.78	376	3.749
Female	***Nil***	11.92	24	3.670
	Less Than One Hour	12.25	99	3.305
	One Hour	12.41	150	3.528
	Two Hours	13.08	62	3.522
	More Than Two Hours	12.63	32	2.970
	Total	12.47	367	3.428
Total	***Nil***	11.83	48	3.423
	Less Than One Hour	12.49	221	3.567
	One Hour	12.50	283	3.700
	Two Hours	13.26	124	3.570
	More Than Two Hours	13.00	67	3.289
	Total	12.63	743	3.595

Except for those students who study for Less than One Hour and One Hour per day, there seem to be no significant difference in the study timing of male students and female students.
There is an extremely small difference in achievement based on the timings of study. However, these small differences seem to be directly proportional to the

number of hours spent reading mathematics: Achievement of students increased with the increase in study timing.

Gender	Memorising helpful?	N
Male	Yes	49
	No, Learn the concept	299
	Other	24
	Total	372
Female	Yes	47
	No, Learn the concept	298
	Other	12
	Total	357
Total	Yes	96
	No, Learn the concept	597
	Other	36
	Total	729

When asked if mathematics and mathematics formulae should be memorised, 597 students out of 729 who responded to this question (299 male students and 298 female students) did not agree that mathematics should be memorised and just 96 students (49 male students and 47 female students) agreed that it could be learnt by memorising.

What can be done to improve your mathematics?

This is the only open-ended question in the questionnaire. Students' response to this question were grouped into two categories. The first category comprised what they should be doing own their own to improve their mathematics and the second, what they think the government should do to help them improve.

When asked what they would do to improve their mathematics, most of the students pointed out the importance of practising mathematics daily. A student writes:

> *To improve my mathematics, I need to concentrate in the class and have to practise daily after school. If we don't know how to solve a question, we should approach our teacher or friends.*

Another student writes:

We must give 100percent concentration while the teacher in teaching. If we have any doubts, it must be solved then and there. I think, to improve my mathematics, I should practise. I should memorise the formulae and be able to use them under any circumstances.

A student, who claims that he has his own way of learning mathematics, says that they should learn the concept and formula first, and practise it using them:

From my point of view, to improve my mathematics, I think I should learn the concept first and then some formula. As a saying goes 'Practice makes man perfect', I should practise it for at least one hour during study time or leisure time.

They also feel that they should immediately clear their doubts without hesitation and fear.

Almost all the students know that mathematics will improve with concentration and practise, but they mention that they get many home works that they don't get enough time to practise and study mathematics.

To improve my mathematics, I must practise more than one hour per day. But my problem is that I can't find time to practise mathematics because we are given too many home works everyday. However, sometimes, when I manage time late at night after having done all the home works, I end up sleeping in the class.

But there are also some students, both male students and female, who think that mathematics cannot be learnt:

- *I think there's no way for me. I think mathematics should be removed from the curriculum and should be replaced by other important subjects.* [Male]
- *Mathematics makes man and woman mad.* [Female]
- *I used to practise mathematics daily. For a day, I know everything I have learnt but when I come to class, I forget all the things. Mathematics is my greatest enemy.* [Male]
- *To improve mathematics, we need to practise a lot. But if possible, it should be removed from the curriculum and another new subject should be included.* [Female]

However, there are some students expressing the importance of learning mathematics and believe that mathematics is the sole provider of good job opportunities.

I think mathematics is the most important for all the students. If we don't learn mathematics we'll not get good jobs.

When asked, 'what could the government do to help improve students' mathematics achievement?', almost all the students taking part in the test said that the answer was to recruit good, quality teachers.

- *As maths is one of the most important subjects, the teacher should be well equipped with full knowledge of every branch of mathematics. Students should be given equal opportunities in the classroom to solve questions so that he/she can enhance his/her knowledge and learn mathematics with full enthusiasm.*
- *I think my improvement depends on my teacher. If my mathematics teacher is good in mathematics and explains the concept very clearly then it's enough for me to learn mathematics.*

The students' responses also include suggestions to the Ministry of Education to conduct workshops for teachers on various teaching methods which would improve students' mathematics achievement:

> *The Headquarters [MoE] must conduct workshops for mathematics teachers on different teaching methods that would improve students' learning.*

The students also emphasised daily classroom affairs and the interactions between the teacher and the students. They basically mentioned how the teacher should teach, behave with the student and respect individual differences.

- *Repeated teachings of the lesson until the students have fully understood the concept.*
- *Teaching at a slow pace with clear explanation would improve my mathematics;*
- *-completion of syllabus is less important than how we students have understood the chapter.*
- *Mathematics teachers should teach mathematics in a pleasant way.*
- *Sometimes the teacher tends to move on even if only a person or two have understood and doesn't explain anymore, which is really bad…Slow and deep explanation, more work and equal attention to all the students is must in improving my mathematics.*
- *The teacher should encourage more classroom discussions and interaction (group activities) among students so that students would open their doubts. And, there should be a good mathematics teacher.*

Interestingly, there seem to be some contradictions in students' views on the strictness of their teachers:

- *Teacher should be strict while teaching so that the fear in students mind would make them learn more.*
- *Teacher should be friendly so that the students would feel comfortable.*

This contradiction supports our finding that students like their teachers regardless of their strictness. Of course, some of the students do dislike their teacher but number is extremely small, and they could be encouraged or asked about problems as to why they dislike their teachers and resolve them.

Findings from Teacher Interview

To have more in-depth information on Bhutanese students' perceptions of mathematics, ten mathematics teachers from the sample schools were interviewed for their views. The mathematics teachers had experiences of teaching mathematics from three years to twenty-seven years. I tried to cover all the aspects of learning mathematics during the interview keeping in mind the ethical considerations and norms of taking an interview.

When asked about the importance of mathematics, all of the teachers responded positively stating that it was the most important part of everyday life. '*We can avoid a language but we cannot avoid mathematics. I can live without speaking or using my mother tongue but it'll be difficult to live without using mathematics*'. Another teacher states: '*Mathematics makes the mind alert. Mathematics makes a mind really good. Without mathematics we cannot be 'healthy'. Mathematics is important for everybody in all walks of life'.* All of the teachers expressed the necessity and importance of mathematics in our daily lives giving examples of simple calculations during shopping to referring to it as the backbone of all science subjects.

The teachers do not stick to just one method of delivery. They change their methods and teaching strategies based on the situation and topics of discussion. They also try to use the methods most liked by the students so that the students would remain enthusiastic and active throughout the process. '*Main aim is to make them skilful, 'alert'. Therefore, every moment we change the method of delivery…from group discussions to chalk-and-talk method, but normally we discuss'.* Most of the teachers end up using the Lecture method as the other methods – Activity based Method, Co-operative Learning and Project Work Method – take a lot of time and create difficulties to finish the already vast syllabus in time. '*I use a lot of activities instead of following only lectures. Activity-based learning is more beneficial to the students but we cannot finish the syllabus on time*'.

The most common difficulties the teachers face are the students' weak foundation in mathematics. Teachers at present face problems in teaching mathematics because most students do not know the basics of mathematics and most teachers have expressed that children should be brought up building 'solid foundations'. The Bhutanese students have already perceived mathematics as a very difficult subject. It becomes difficult for teachers to convince the students that mathematics is an easy subject. '*Students have already developed a negative attitude towards the subject and students consider mathematics as a difficult subject, so it becomes very difficult for us to teach them*'. Some teachers also expressed lack of time and resources for effective teaching.

There were different responses to the question of gender difference in achievement. All of the teachers claimed that they did not allow the issues of gender inequality and favouritism to arise in the classroom. But when asked about the difference in achievement, most were in favour of male students, because most teachers believed that girls were weak compared to boys. They also thought that male students easily grasped the concept while female students just memorised. '*In Bhutan, the people have a soft attitude. And in this population, obviously the girls*

are softer. Their inhibition hampers their performance. They are not friendly, and they don't come openly to ask questions. They cannot compete with boys, and I am not just saying this because I am a male, but the results from last nine years show that girls' performance is lower than boys". Some teachers expressed their views in favour of girls as they have observed boys to be careless. But some said that difference in achievement emerged only after Class X.

There was also a same type of response to the question of difference in participation of male students and female students. Some teachers said that the male students openly asked questions and actively participated in the class, while some said that it was the other way round. But some stated that it depended on the teachers: '*It usually depends upon the teacher. I am very friendly with the students. I do not let them cross all the borders. I try to be as fatherly as I can, as friendly as I can. So in that way they would feel very comfortable. If the teacher, every time when he comes to the class, keeps scolding the students, it would demoralise the students and they would start hating the subject*'.

Like the students, the teachers also had different views on their strictness. Some teachers thought that their strictness would make the students perform better and others thought being less strict would encourage the students to come forward openly to clear their doubts.

'*There should be decorum during teaching-learning process for the benefit of all, and teachers are the administrators. But, I feel sorry to say this; there are teachers who always show anger, which is actually an awkward scene.*
A teacher should be lively, bubbly, effervescent, and happy because after all we have to be there in front of the students for about fifty minutes. And in this period of time, if I as an elder show my anger, temperament, I am not a teacher then.
I don't like to be very strict but I am particular in my subject. In this way, I am able to get what I expect from them'.

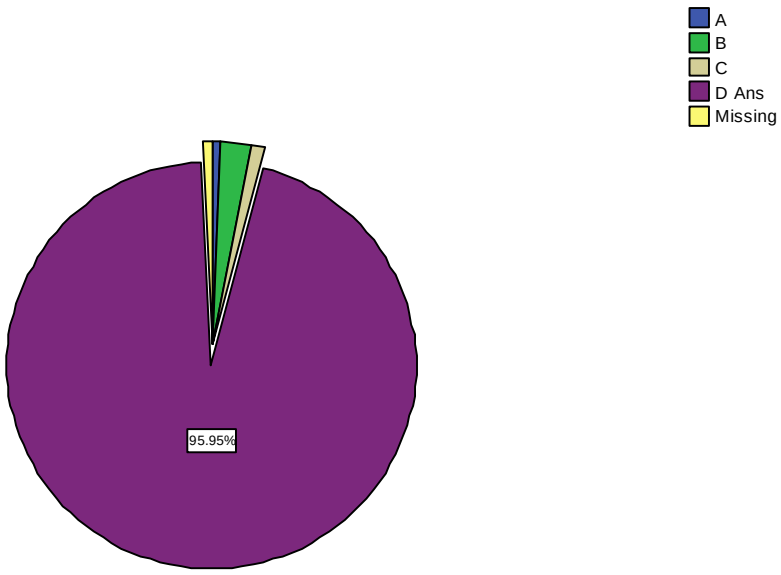
Those teachers who supported strictness mentioned that their students would have the fear and learn more, and also do the things on time. '*When a teacher is frank with the students they tend to take advantage of the teachers but when a teacher is strict the fear the students have make them work harder in the subject and do things on time, especially their home works'.*

Item Analysis from the Mathematics Proficiency Test
Standard of Mathematics: What are they expected to learn?

When the teachers expressed that the students did not have a strong base in mathematics, it encouraged me to further analyse their ability in mathematics. I have taken some questions from the Test which they would have learnt when they were in Class VI and Class VIII. Since there is no benchmark to compare their standard of mathematics, I have compared their performance with what an ideal Class X student should know. For example, a Class X student should know that 'the total sum of interior angles of a triangle is 180 °', he/she would have learnt the rule since the first time he heard about the properties of a triangle in Class VI.

A. The students could easily solve questions that required less logical reasoning: How much is 8% of 600?

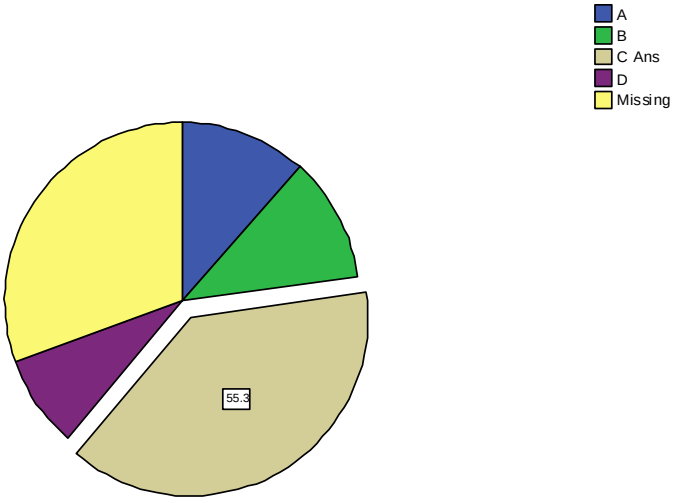
Question 4



95.95percent of the students got the question correct.

B. Nearly half of the total number of students failed to make use of the formula in the question: By selling a scooter for Nu 11200, an auto dealer makes a profit of 12% on his cost. What is the cost price?

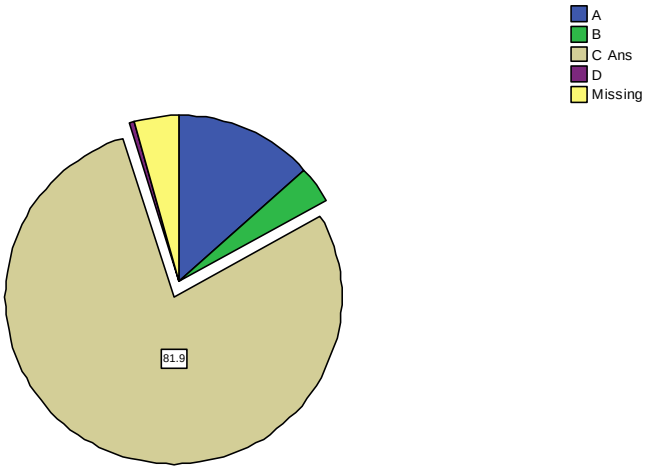
Question 5



Only 55.3percent of the students got it correct.

C. The percentage of students who got the correct answer for the question, 'The sum of all the interior angles of a triangle is equal to', is as follows:

Question 13

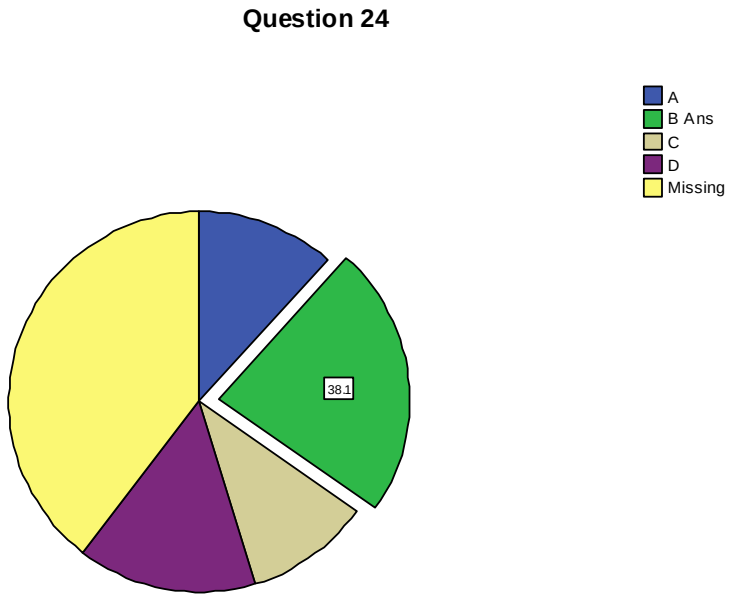


Though 81.9 percent of the students got the right answer, the result is still not satisfactory, for the property of triangles is the basis for more sophisticated

discussions on properties of triangle. I strongly feel that 100 of the students should get it correct.

D. A two-digit number is 4 times the total of digits therein. If 36 is added to the number, the digit interchange places. What is the number?

The percentage of students who got the correct answer for the question is as follows:



Only 38.1percent of the students got the right answer

CONCLUSION
Discussions and Recommendations

Students' Attitude towards Mathematics
The difference in achievement of male students and female students, at all the three stages of education (Classes VI, VIII, and X), was found to be insignificant.

The average age of students was greater than what a Class X student is expected to be. Yet, it had a negative affect on students' achievement. Older students secured lower score than their younger counterparts. More rigorous studies should be conducted to find why these older students failed to score higher marks.

The number of male students and female students who liked mathematics was almost the same, and their achievement was also the same. This could have contributed to the insignificant difference in achievement. But we are still not clear why students liked mathematics if they did not think it was fun and interesting.

Bhutanese students in general have perceived notion that mathematics is uninteresting, and their overall low achievement could be attributed to this reason. Yet, they still thought that they need to study mathematics and it should not be removed from the curriculum as it was important for the development of the country.

In both the cases of male and female students, most students' confidence in mathematics at present is lower than it was when they were in primary schools. When asked to rate themselves in mathematics, more students rated Very Good and Good in primary school. As observed from the findings, students who rated themselves Very Good and Good secured higher scores than those who rated themselves Poor or Very Poor.

Students' achievement in mathematics is also related to their choice of subject. Those students, both male and female, who chose mathematics as their best-liked subject secured higher scores, and those who considered mathematics as their least-favourite subject secured the least.

Teacher Influence on Student Achievement

There was a correlation between students' liking for their teacher and their achievement in mathematics.

In general, students' achievement strongly depended on the influence of their teachers. Though the difference was small between those who liked and those who didn't like their teachers, this difference would, I strongly believe, diminish if the teachers tried to make the students like them and the subject. The study also found out the existence of a strong relationship between students liking the subject and their teachers.

The teachers, as mentioned by themselves and the students, tried very hard to teach the students by changing the method of delivery in relation to the topics of discussion. But most seem to end up using the Lecture method because of time constraints and due to the vast mathematics syllabus. The same method of delivery would be monotonously discouraging if the students did not like it. And in the long run, students would end up disliking the subject.

When it came to the teacher being strict, both the teachers and students had two different responses. Some of them, both teachers and students, thought that they should be strict because their strictness would instil fear into the minds of the students that would drive them to learn better and perform better. But the other view was equally justifiable. Teachers and the students thought that if the teacher was frank and friendly, the students would come forward and clear their doubts more openly.

Students' Mathematics Study Time

The difference in the study timing of male students and female students was insignificant. They seem to devote the same number of hours for mathematics. Their achievement in mathematics based on the timings of study was also insignificant. However, these small differences seem to be directly proportional to

the number of hours spent reading mathematics: Achievement of students increased with the increase in study timing though this increase was very small.

When asked about the time for home works, the students said that the teachers, not just mathematics teachers, give so many home works that they failed to study every subject with full devotion and concentration. However, a mathematics teacher told that they were trying a new strategy for home works so that students would learn better and do the homework at the same time:

> *In a staff meeting on student's assessment, I put forward a proposal for home works. Home works are necessary and should be given to the students but the quantity should be checked. It's not wise to see seven teachers coming to a classroom and giving seven different home works. The students will not be able to do and submit all of them the next day. A student is in the school from 8 am to 4 pm. From 4-5 pm, it is time for SUPW, after that they need a little time for games and sports, and in the end, they hardly get 2 – 3 hours to study. So, we have decided that not more than three home works shall be given to the students (as per the subjects) per day. A chart is to be put up in all classes and all teachers are required to mark home works given by them.*

There should be more effort of this kind from the school to facilitate student learning.

When the students were asked if memorising mathematics was helpful, most of their response was no. They said that learning the concept was more helpful. Yet, most of the students seemed to learn mathematics by heart. Students were able to solve questions that required less logical reasoning, but when it came to questions demanding logical power, they failed to answer them correctly.

Although gender difference in achievement in mathematics is insignificant, I have found out many issues related to students' achievement in general. Most Bhutanese students have developed the idea of mathematics as a difficult and uninteresting subject. They have already developed some negative perceptions about mathematics, which eventually hampers their enthusiasm, devotion and performance.

As it was found out that teachers have a huge influence on students' attitude towards the subject and their achievement, teachers should try to address students' problems in a fair manner. And since teachers are the second on the list with whom students discuss their problems, teachers should try to always encourage them.

The teachers pointed out that students failed to perform better because of a weak foundation in mathematics. Some teachers seem to be frustrated because the students did not even know the basics of mathematics. They said that students should be brought up with good mathematics education so that they faced fewer problems as they reach higher levels. Most Bhutanese students fail in mathematics because of the weak foundation in mathematics. This reason should be more rigorously studied, and if it is true, new strategies for primary school mathematics should be developed.

Standard of Mathematics

Most students were able to answer the direct questions which required less logical reasoning. The students were able to use formulae which are directly applied to get the answers. For example, students are aware of what '%' symbol in 8% of 600 means. However, there are still some students who failed to answer it. When it came to the questions with some convolutions, even though all they needed to do was just apply the formula, nearly half of the students failed to answer the questions correctly. They couldn't use the formula when the question was more complex. Their intellectual capacity to use the formulae is in question. The majority of students failed to answer the questions that required them to use their problem-solving skills. Most of the students didn't even seem to understand the question and the ways in which they could approach it.

The options for Question 25 in the Test had a printing error, but it was purposefully left unchanged in hope that a few students would notice it and come forward. Out of 747 students who took the test, no one noticed the mistake. It was expected that they would notice, as the error was the answer to the question. Their problem solving skills and their confidence in mathematics are questionable.

In Bhutan, since the advent of modern education, male and female students received equal attention and opportunities for education. However, since most people are still driven by social beliefs and stereotypes, there are perceptions that women are weaker in mathematics. However, this study found out that the difference between achievement levels of females and males was very insignificant. As the first of its kind, this study will have to be followed up by similar studies to confirm or contest its findings. This study also found that the standard of mathematics in general at the Class X level in 2006 was poor.

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THE CHANGING ROLES OF TEACHERS AND LEARNERS

***Tsering Y Nidup*[5]**

Introduction

Much of the language produced in classrooms these days is based on the popular methodological cycle, often referred to as the PPP sequence. The three part cycle consists of the presentation, practice and the production of a single grammatical form or item. PPP is widely accepted throughout the world and forms the basis of many teacher training courses and sometimes it is the only methodology offered to trainees. The PPP approach is perhaps based on the assumption that what is taught is indeed learned but, from experience we only know too well that this is not the case.

Innumerable research in second language learning suggest that one cannot actually predict what learners are going to learn at a given time and that since learning is a complex process, it cannot be simply accounted for within a presentation methodology. Therefore, though the PPP model has well established itself as a reliable approach, it has many disadvantages. The flaws in it outweigh the advantages and have led many researchers to discredit such a methodology.
Based on the scenario above, the following essay attempts to discuss and propose an alternative to the PPP model in the form of the task-based framework. The essay is divided into six sections. The beginning of the essay discusses briefly the origin of modern grammar teaching with specific reference to the Grammar Translation method and the PPP model which forms the content for the Communicative Language Teaching section. The reasons for discrediting the PPP model are discussed next, followed by an alternative to it in the form of the task-based framework. The clear advantages the task-based framework has over the PPP model are discussed, followed by the concluding part of the essay, which establishes the place of task-based framework as a necessity within the current trends of language teaching methodology.

The Origins of Modern Grammar Teaching

Before the 1800s, the study of Latin and Greek was dominant. Latin and Greek and were studied purely for intellectual advancement since most of the classics were in those languages. The study of these languages was obviously not for communicative purposes, as they were spoken by no one. The development of mass transportation systems and the increase in foreign travel opened people's eyes to the growing needs and benefits of studying other languages. 'Since there was little if any theoretical research on second language acquisition in general, or on the acquisition of reading proficiency, foreign languages were taught as any other skill was taught.' Brown (1994: 16). It was due to such circumstances that the varied approaches towards modern grammar teaching gradually saw fruition. The Grammar-Translation method was one such approach to teaching grammar, and it will be briefly touched upon next.

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The Grammar-Translation method had it's origins in the study of these classical languages. Larsen-Freeman (2000) provides us with a concise introduction to what is meant by the Grammar-Translation (G-T) method although she does not differentiate it from the Classical method.

> The Grammar-Translation method is not new. It has different names, but it has been used by language teachers for many years. At one time it was called the Classical Method since it was used in the teaching of the classical languages, Latin and Greek (Chastain 1988). Earlier in this century, this method was used for the purpose of helping students read and appreciate foreign language literature. It was also hoped that, through the study of grammar of the target language, students would become more familiar with the grammar of their native language and that this familiarity would help them speak and write their native languages better. Finally, it was thought that foreign language learning would help students grow intellectually; it was recognised that students would probably never use the target language, but the mental exercise of learning it would be beneficial anyway.

It can be seen though that the G-T does differ in one important aspect from the Classical Method in the use of sentences to exemplify a grammatical point instead of passages from classical works. 'Grammar translation dominated European and foreign language teaching from the 1840s to the 1940s' (Richards and Rodgers, 2001:6). In its conception it was reformist, in that it was developed as a way of teaching large groups of students in school.

Language learning prior to this had been undertaken mainly on a self-study basis by scholars, trained in classical grammar. These classical methods did not easily adapt to large classrooms of young learners. However, G-T still remains popular in many countries around the world and this may probably be due to a number of reasons out of which its popularity may perhaps be attributed to the fact that ' it makes few demands on teachers' (Richards and Rodgers, 2001: 6). It is also easy to design tests, as the teacher knows exactly what has been taught. Tests are usually entirely written and are marked with accuracy as the most important factor. The time taken to mark these tests is minimal.
The sustained shift from traditional methods to that of a more communicative one will be discussed in the lines that follow.

Communicative Language Teaching (PPP sequence)

To analyze all of the various methods of language teaching over the past century is not within the scope of this paper and does not seem practical. However, it is important to look briefly at the communicative approach to teaching with specific reference to the PPP sequence, as this would lead directly into the main discussion of this paper.

Presentation, Practice and Produce (PPP) 'has become the dominant model for 'communicative' lessons ' Edwards (cited in Willis and Willis, 1996: 99). It involves presentation of a language point followed by practice of the point in a controlled

manner, perhaps followed by freer practice, and then finally a production stage using the language point.

In a PPP lesson, the teacher introduces a new linguistic form to learners through a focused presentation, which often includes contextualisation of the new form, a deductive explanation or elicitation of how it works, and some tightly controlled production activities in the form of repetition drills. Next, the teacher relaxes control in that the learners are given practice activities which allow them to gain confidence with the new language, while still focusing on form over meaning. Finally, in the production stage, control is relaxed and learners are allowed freer practice activities that prompt them to engage in meaningful exchanges through tasks which elicit the use of the target form. Implicit in this sequence is the idea that learners can move from zero knowledge to productive mastery of a new form in the span of a single lesson, though nowadays such a notion is highly disagreed upon by practicing teachers and researchers alike (Celce-Murcia & Hilles, 1988; Harmer, 2001).

PPP enjoys great popularity among teachers even today. This is probably because of the convenience it offers to teachers in that the teacher is seen in command and the whole sequence is very much teacher-red. There is clear evidence of the power relations that operate within the class since the teacher's professional techniques seem to be in command. However, it has come under heavy criticism, especially as a model for teacher-trainees to follow and for 'the role that teacher trainers play in perpetuating familiar but outmoded, methodologies.' Skehan(1996, cited in Willis and Willis, 1996:18) . The reasons for the sustained attack on the PPP sequence in the 1990s will be discussed briefly hereafter.

Criticisms leveled against the PPP sequence

Despite the varied reasons provided as evidence for its enduring influence, it is often criticised on the basis of its teacher-focused approach and its lack of theory and most importantly, for its lack of unequivocal neglect of the learner in question. Some of the major criticisms levied against this approach will be discussed in the lines that follow.

Harmer (2001:8) is of the opinion that, though the PPP sequence is appropriate at the beginner and elementary level, it is less likely to work at the higher levels since 'accurate reproduction and controlled repetition seem out of place.' The basis of much of the criticism on PPP is also based on the notion that an important gap exists between teaching and learning. Theories for the origin of this gap tie on the idea of the internal syllabus, the natural acquisition of linguistic structures which people must go through when learning a language. For instance, students may demonstrate a good grasp of a certain form in the class but may actually not be able to produce it correctly or exhibit the same control in a real communicative situation. Thus, PPP is seen as a clumsy attempt to ignore this natural order and input is not equivalent to output, as firm believers of the PPP would like to think Skehan(1996,cited in Willis and Willis,1996; Ranalli, 2001).

Thornbury(1999:105) thinks that another major flaw in the PPP sequence is in the claim that there is an excessive emphasis on productive practice. Asking students

to use new grammar immediately, besides being unnecessary proves to be 'counterproductive, in that it may distract attention from the brainwork involved in understanding and restructuring' of the learner's interlanguage. Rather than production, Thornbury believes that teachers should draw the learner's attention to important features of the form under study.

Furthermore, Ellis (1993) suggests that this approach is ineffective in achieving what it is intended to do and this is probably because of the controlled nature of the input that students receive. Brumfit and Johnson (1979) and Ellis (1985) (cited in Skehan 1996:18) too believe that the claims made by the PPP approach to learning and automisation in 'that learners will learn what is taught in the order it is taught, no longer carries credibility these days in linguistics or psychology.'

PPP often teaches at the expense of real input. For the same reason, the Grammar Translation method was criticised mainly because of the use of decontextualised sentences to exemplify a grammar point. Often these sentences were fabricated by the authors of textbooks as in the example, 'I have received this horse from my friend' Ahn (1834, cited in Howatt, 1984: 141). Though the goals of PPP and Grammar Translation are very different, they are similar in certain aspects in that they teach by presenting a language point, be it grammar of function, and proceed to practice it. This approach has received a great deal of flak during the 1980s and the explicit teaching of grammar became taboo in theory though not actually in the classroom.

The PPP sequence of teaching grammar is still applied in classroom and is very much around probably for the same reasons that Grammar Translation was the method of choice for so long. White (1988, cited in Skehan, 1988:94) says it is probably because it secures the teachers roles and provides clear accountability, thereby explaining 'the persistence of what is essentially a discredited, meaning-impoverished methodology.'

All the criticisms leveled at the PPP sequence can best be justified in the words of Ellis (1993: 6) when he states that, a language learning programme should:

> ...seek to draw out learners' conscious attention to problematic grammatical features, not with the expectancy that they would master these features and use them in communication immediately: but, rather, the expectancy would be that they learn what it is that they have ultimately to master.
>
> Ellis (1993:6)

Thus, despite its popularity, the PPP was deset with limitations, even when backed up by skills lessons. An alternative to the PPP sequence will be discussed next.

Task-Based learning, as an alternative to the PPP model

Early research in SLA on grammar focused instruction clearly demonstrated loopholes in the PPP approach but, it did not provide a clear alternative. Around the mid 1980s, however, alternatives were proposed by researchers who looked closely at classroom interaction as a basis for promoting concrete learning and

gradually a consensus emerged among researchers and teachers alike Duff (1986);Doughty and Pica (1986)(cited in Skehan, 1996). Among the various alternatives proposed, the task was seen as one such approach teachers could employ in the classroom. Tasks were seen as appropriate vehicles to provide meaning coupled with the ability to offer a range of interaction.
In the next section of this essay, the rationale for task-based language teaching will be provided along with an overview of why the task-based approach is a better alternative to the PPP sequence.

Rationale for task-based language teaching

Task-based language teaching (TBLT) proposes the use of tasks as a key feature in the language classroom since it has been proved that tasks provide a better context for activating learner is acquisition of a second language. TBLT is thus based on a theory of language learning rather than a theory of language structure. Richard and Rodgers (2001: 228) suggest that this is because 'tasks are believed to foster processes of negotiation, modification, rephrasing, and experimentation that are at the heart of second language learning.'

Feez (1998, cited in Richards and Rodgers, 2001) summarises the tenets of the TBLT based on its reliance on some basic assumptions. Of prime importance is the fact that the focus of attention is more on the process rather than the product. Here through the use of purposeful activities and tasks, communication and meaning are emphasised. It is assumed that learners learn language through communicative interaction through their engagement with meaningful activities and tasks. Skehan (cited in Willis and Willis, 1996) tells us of two types of tasks: tasks that learners might need to achieve in real life or tasks that have a pedagogical function specific to the classroom, whereby 'the difficulty of the task depend on a range of factors including the previous experience of the learner, the complexity of the tasks, and the degree of support available.'

A focus on form and grammar is seen as essential for efficient learning and effective communication. For instance, Nunan(1989:13) states that 'there is value in language activities which require learners to focus on form and that grammar is an essential resource in using language communicatively.' Thus, the importance of the emphasis on form in the context of meaning is of high priority in the TBLT approach. Long and Robinson (1988, cited in Shehadeh,?) stress on the importance of focus on form for L2 learning by drawing students' attention to linguistic elements, not as discrete items presented to the learner, but as they arise in a meaningful classroom context . In other words, in the TBLT approach, the learner learns by doing and engaging in meaningful activities that the learner's system is encouraged to develop. The PPP approach on the other hand looks at 'the learning process as learning a series of discrete items' and not at learning as a comprehensive whole, Skehan (1996, cited in Willis and Willis, 1996:20).

Tasks are, therefore, seen as core components of fluency-based pedagogy, although defined in varied ways depending on the angle it is viewed from. Definitions of task vary for SLA researchers who define it in terms of its usefulness for eliciting and collecting samples of learners' language, whereas other define tasks from a purely classroom interaction perspective. Nunan's(1989, cited in Richards and Rodgers,

2001:224; Hinkel and Fotos, 2002:36) definition of task is often one of the most pedagogically-cited definitions of a classroom task. He proposes that a communicative task: '... [is] a piece of classroom work which involves learners in comprehending, manipulating, producing or interacting in the target language while their attention is principally focused on meaning rather than form. The task should also have a sense of completeness, being able to stand alone as a communicative act in its own right.'
Having defined the term 'task' and establishing the usefulness of tasks in providing better contexts for activating learner acquisition in the language classroom, what happens in the task-based learning framework in the form of the well known task cycle will be discussed hereafter.

Task-based learning and language instruction

Willis's (1996) framework for TBLT, commonly cited and used by teachers and researchers alike, falls into three main categories (pre-task, the task cycle and language focus) and will be briefly discussed.
The pre-task phase introduces and familiarises students with the topic and task to be performed, thereby providing them the necessary background to the task at hand. In the task phase, learners carry out a meaning-focused activity. Learners are more likely to concentrate on fluency at this stage, producing forms of the language that come readily to them. In the report phase, learners present the results of their task to the whole class. The report stage according to Willis (1996: 56) ensures 'a smooth transition from private to more public interaction' and for this to happen, learners are given a planning phase between the task and report phase. In the planning phase, learners attend to form and try and produce more complex language. This framework provides opportunities for fluency, accuracy and complexity to develop.
The use of tasks has been advocated in language teaching with the assumption that its use will help learners develop not only communicative skills but also an acceptable level of linguistic performance. Tasks are seen as 'part of the process by which linguistic and communicative competence are developed.' Richards (2002, cited in Hinkel and Fotos, 2002:36). Thornbury (1998, cited in Hinkel and Fotos, 2002:37) believes that linguistic competence can be achieved with negligible help from the teacher although at large 'form will largely look after itself....Grammar has a mediating role,' and is not an end in itself. This very feature empowers both teachers and learners. A degree of flexibility exists for both the teacher and learner since they are presented with learning objectives and problem solving tasks, rather thaan a set of specific linguistic items, Kumarvadi(1993, cited in Hinkel and Fotos, 2002).
Therefore, in the task-based model, there is evidence to suggest teacher-class negotiations with no conscious simplification of language. This is possible because language is not pre-determined and opportunities exist for authentic and meaningful interaction, which is not the case with the PPP model. The differences between the PPP model (Grammar-Focused Activities) and the task-based model can best be summarised by looking at the general overview the table below provides below, thereby subtlely revealing the advantages that the task based model clearly has over the PPP model.

Summary of Grammar and Task-Focused Activities

Grammar-Focused Activities

Reflect typical classroom use of language
Focus on the formation of correct examples of language
Produce language for display (i.e. as evidence of learning)
Call on explicit knowledge
Elicit a careful (monitored) speech style
Reflect controlled performance
Practice language out of context
Practice small samples of languages
Do not require real authentic communication

Task-focused Activities

Reflect natural language use
Call on implicit knowledge
Elicit a vernacular speech style
Reflect automatic performance
Require the use of improvising, paraphrasing, repair, and reorganisation
Produce language that is not always predictable
Allow students to select the language they use
Require real communication

(Jack C. Richards, 2002:37)

Conclusion

It now seems easy to differentiate between the PPP model and the task-based learning framework and also see why the task-based learning model is a better alternative to the PPP model. The main difference between the two is that the focus on language form comes at the end in the task-based learning model. The communication task itself is central to the framework. Task-based learning framework is more flexible and offers students far richer and wholesome learning opportunities than the PPP model. The techniques employed and the order in which the components are arranged in the Task-based model are based on sound principles, unlike the PPP. Thus, the learner begins with a holistic experience of language in use followed by a closer look at some of the features naturally occurring in that language, something which the PPP model clearly ignores.

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EFFECTIVENESS OF GROUP WORK IN TEACHING THE MODULE 'TEACHING OF SCIENCE'

Yuden[6]

Introduction and background

Group work is one common strategy that I use with my students in the modules that I teach. Group work is a popular strategy that I have been using for the last few years, especially in 'Teaching of Science' (SCI 2406) where student teachers learn how to teach science. The group works assigned required students to plan, carry out the tasks, compile procedures and results, present the findings to the class and submit a written report to the module tutor. SCI 2406 is a module offered to the second year students of Bachelors in Education Degree (primary) at the College. The module focuses on methodologies and strategies of teaching science in the upper primary classes (Classes IV-VI).

Kostelnik et al (2004), as quoted in Soderman (2005) say that children learn new ideas best when they can actively experience them and discuss their learning. This is possible only in small groups where children have more occasions to talk.
Hartley and Macro (1997:101-102) define cooperative group work as that which requires children to work in different tasks in order to produce a joint outcome. Whilst this type of work has value, it does not necessarily encourage children to talk together and to listen to one another. A true collaborative work involves children sharing jobs and making decisions together in order to complete a task which appeals to them.

When working collaboratively, less confident children can be enthused by their better peers. And the aim is to develop thinking through communication. This type of work can be useful, not only in developing concepts but also in allowing children to practise skills. For example, when the children have to decide on a best ball, they will have to talk and agree on what a best ball is and work out a strategy to solve the problem. This will require planning and investigative skills, as well as social and linguistic skills (Hartley, K. & Macro, C. 1997).

Planning and carrying out science investigations in small groups can be useful. Hartley & Macro (1997) state that, those who are successful, are usually from schools where children are involved in decision-making and everyone's ideas are valued. Such skills are encouraged mostly through group work. The groups that I formed usually comprised at least 5 students representing both male and female members of the class. The groups were generally given tasks of the same nature to facilitate the same kind of development and learning experiences.

My experience as a participant in group works confirmed that it is a useful and appropriate tool to make learning meaningful. However, my concern is how well it helps make my students good science teachers. It is observed that students get involved in group works, but its success as a strategy is not yet clear. There had been complaints of group members not participating throughout the group

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activities. This study is expected to reveal some important reflections of my practice, the improvement of which would lead to my professional enhancement. Since group work is also widely used in teaching other subjects, it is hoped that findings of this study would help other teachers and educators use the strategy effectively.

This study thus aims to find the effectiveness of group work as a strategy especially in the teaching and learning of 'Teaching Primary Science'.

Study objectives

The study attempts to find out the following:

- the student's knowledge on group work and its uses
- their attitude towards working in groups
- the effectiveness of the instructional aids that I used
- the usefulness of group work in developing leadership qualities and social values in students
- the difficulties faced by the students in carrying out group activities
- advantages that group work offers to students
- problems and possible solutions for making group work an effective strategy for teaching the module SCI 2406
- the researcher will gain a lot of insights into organising group works that would enrich my pedagogical skills and improve my professionalism.

Methodology

A survey was carried out on the student teachers undergoing Bachelors of Education Degree (Primary) (Sections A&B) second year of 2006. There were 69 students: 42 males and 27 females who participated in the survey. Two students were missing on the day of the survey. The students spent around 20 minutes filling up the questionnaire which comprised four open-ended items and 26 pre-coded items. To solicit better responses and ensure reliability and validity, anonymity of the participants was maintained. The questionnaires were collected through a student. The open-ended items were analysed by colour-coding while the pre-coded items were analysed using SPSS 11.5 processor.

Analysis and findings

1.1. Students' knowledge on group work

Most participants describe group work as student centred where a team works together for a common goal by exchanging ideas, resources, skills, suggestions and knowledge in a cooperative manner. Group work is also described as a tool which enhances development of social values such as: team spirit, cooperation, mutual understanding, listening to others, helping others, compromise, respecting each other, socializing, sense of belonging, and confidence by speaking in smaller groups.

Most of the participants seem to have a good knowledge on group work. It is also evident that the students understand the purpose and values of working in groups. It gives enough confidence in assuming that members in groups carried out their responsibilities towards fulfilling their social obligations.

1.2. Opinion on group work

A good number of respondents perceived group works to be positive if all the group members were cooperative, hardworking, willing to work together and shoulder responsibilities. Hardworking members seem to get the major portion of work which takes away opportunities for the weaker ones to try making them more lazy. If group members are not changed often, group work can appear monotonous.

In this view, one basic requirement for the success of a group work is every individual being actively and whole-heartedly involved. A collective effort by all the members is what counts. It demands proper planning by the teacher and holding each member accountable throughout the group work. This might be possible by work delegation among the group members, either by the group leader or by the teacher. Besides change of group members, assigning new, unique and challenging tasks, I think, would also help break monotony.

1.3. Group formation

Most participants feel comfortable with students forming their own groups following guidelines by the teacher. But they point out that it is crucial for the teacher to ensure heterogeneity. This strongly indicates the preference for social grouping. Given the unequal numbers of males and females in the class, it is often quite difficult to work towards balancing, but each group was checked well to ensure the presence of a certain number of either gender as determined by the actual number existing in the class. Majority of the respondents feel that a frequent change in the group members provided a good avenue for interaction and creativity. This variation, as expressed by the respondents, helped in intellectual development. The objectives of the group work were reported to determine the nature of groups formed. Some respondents also mentioned the need to consider the abilities of members to enable transfer and support of learning within the groups. A group having some high achieving members reported of gaining incidental knowledge and realisation through the course of working together.

2.1 Advantages of working in groups

	Identify new & creative ways	Achieve common goals	Respond to needs and problems	Acquisition of values
Not well at all			(1.4%) 1	
Not so well		(4.2%)3	(5.6%) 4	(2.8%) 2
Well	(26.8%) 19	(56.3%) 40	(50.7%) 36	(35.2%) 25
Very well	(73.2%) 52	(38.0%) 27	(40.8%) 29	(60.6%) 43

Table 1: Areas contributing to individual growth and development in a group

Working in groups is seen to be advantageous in making group members realise their potential and commitments (see Table 1). Around 73 percent (52) of the students say group work helps them 'very well' in identifying new and creative ways of solving problems, and more than 26 percent (19) responded as helping them 'well'. 56 percent (40) of the students found group work to be helping them achieve common goals 'well', and 38 percent (27) were helped 'very well' to achieve common goals. Group work was found to facilitate responding to needs and problems of the group members 'well' by more than 50 percent (36) while more than 40 percent (29) felt that it helped 'very well'. Around 5 students felt that group work was not good enough to address the needs and problems of the group members. More than 60 percent (43) felt that group work helped group members acquire value 'very well'. Some 35 percent (25) felt that group work helped acquire value 'well'.

Overall, group work seems to help students develop creativity, achieve common goals, address the needs and problems of the members and acquire values. As such, working in groups seems to contribute in the personal development of students which, over time, contribute to producing a successful end product by the group. The majority of the students found group work to help personal development of individuals 'well' and 'very well', which are the highest on the rating scale.

2.2. Evaluation on benefits and satisfaction of group work

	Satisfaction from group work	Benefits from group work	Roles in group work	Organisation by lecturer
Not at all			(2.8%) 2	
somewhat satisfied	(8.5%) 6	(8.5%) 6	(1.4%) 1	(11.3%) 8
mostly satisfied	(60.6%) 43	(66.2%) 47	(64.8%) 46	(54.9%) 39
completely satisfied	(31.0%) 22	(25.4%) 18	(31.0%) 22	(33.8%) 24

Table 2: Summary of benefits and satisfaction from group work

Group work seems to have a great benefit and satisfaction to group members. The majority of the students rated group work 'mostly satisfied' and 'completely satisfied' (see Table 2). For a few of them, group work was not as satisfactory as they had expected. Two participants were not at all satisfied by their roles in the group work. Although there is a high percentage of students finding benefit and satisfaction in the lecturer's way of organisation, some eight students were only somewhat satisfied. I would like to take it seriously so that I develop better ways of organising activities to benefit all the students.

2.3. How did group work assist in developing leadership qualities?

Qualities	Never	Sometimes	Most of the time	Always
a) Formal and informal leadership	(1.4%) 1	(50.7%) 36	(38%) 27	(9.9%) 7
b) Taking responsibility		(7.0%) 5	(78.9%) 56	(14.1%) 10
c) Fostering respect, trust			(56.3%) 40	(43.7%) 31
d) Combining resource and skills		(7.0%) 5	(60.6%) 43	(32.4%) 23
e) Share materials, ideas		(25.4%) 18	(40.8%) 29	(32.4%) 23
f) Appropriate work behavior		(19.7%) 14	(49.3%) 35	(31.0%) 22
g) Comfortable decision		(5.6%) 4	(45.1%) 32	(49.3%) 35
h) Support decision		(5.6%) 4	(73.2%) 52	(21.1%) 15
i) Felt left out	(54.9%) 39	(43.7%) 31	(1.4%) 1	

Table 3: Relationship of group work and leadership qualities development

As indicated in Table 3, group work activities seem to facilitate development of leadership qualities. Group work very well seemed to have supported b), c), d), g) and h) because a high percentage of the participants have marked 'most of the time' and 'always' on the rating scale. The actual formal and informal leadership are not always developed but more than 50 percent (36) of the participants felt that sometimes working in groups helped develop these qualities. This reminds me of reorganisation and reforming of groups and rotating of responsibilities among the group members.

Working in groups seemed to encourage students to share materials, ideas and resources to a great extent. Group work also seems to promote practice of proper work behavior most of the time (f). Except for one, most of the students, 54.9 percent (39), never felt left out from group work while 43 percent felt that sometimes they felt left out.

Except for one student, rest were engaged quite well. 54.9 percent (39) reported 'never' been left out, while 43.7 percent (31) reported having felt left out 'sometimes'. The group members in many groups have been well engaged always while almost an equal percentage was engaged most of the time. In this light, all the group members seem to have contributed to group work although to different extents.

2.4. Effectiveness of the instructional support

The instructional support for group work included clarity of instruction and direction given by the teacher for different works in the class, adequacy of materials (school textbooks and manuals, handouts, science equipment, working materials such as papers, transparencies, cello tape, marker pens, and sketch pens) and quality of supervision support.

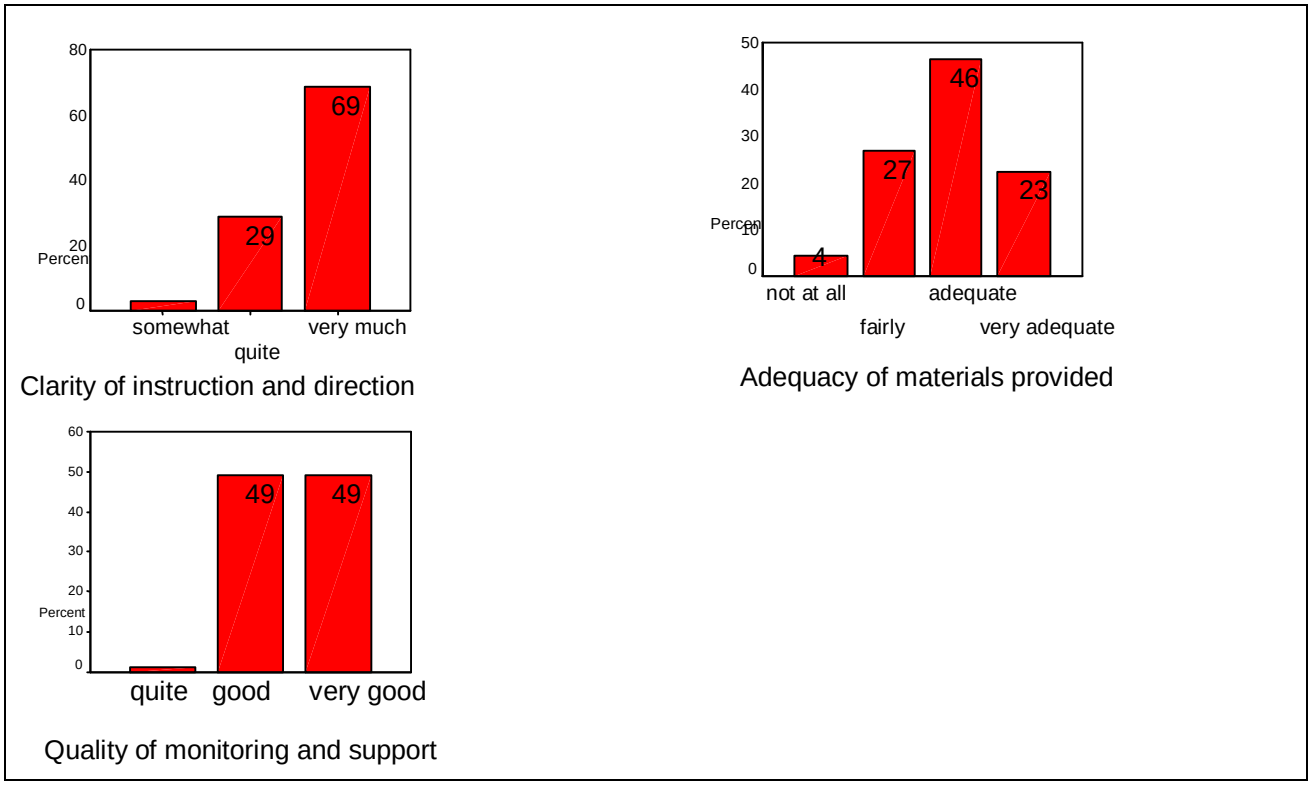


Figure 1: Support medium for effective group work

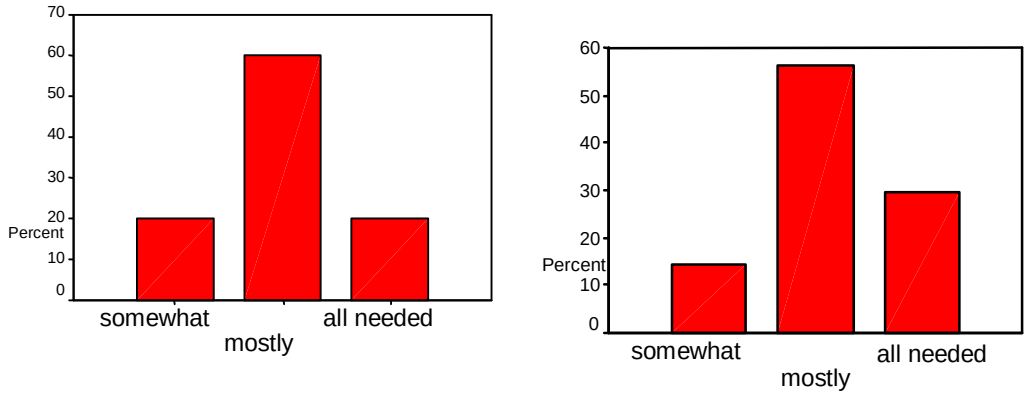
A high percentage of the students found the instructional support efficiently assisting the learning process (see Figure 1). 69 percent of the students responded that instruction and direction for activities were 'very good' while 29 percent found it to be quite clear. There are also some students who found my instructions to be 'somewhat' clear. The reason could be my fast speech and soft voice which often have been pointed out by students and colleagues. Probably the few last benchers would have missed out on my instructions. There is also a possibility of some students with hearing problems. I plan to make conscious effort in correcting my speed during speaking. I also plan to provide repeated instructions, written instructions and use other students to help the rest with problems. I would also like to make use of group leaders to relay the directions and instructions of the activities to respective groups.

46 percent of the students found the materials to be 'adequate', 23 percent very adequate and some 4 percent, just supporting the basics. The other materials were supplied quite abundantly while the school textbooks and manuals were not

always possible to be given luxuriously to all group members. The textbooks and manuals had to be shared among the group members and also with other groups. Often this led to the materials being collected for recirculation. Although the library has a stock of these materials, the students would not have been able to use them judiciously because of the need for them to borrow books for other modules using their library cards. There also were other classes using these materials, thus making the accessibility to the materials very difficult sometimes.

It is impressive to see that monitoring and support were done very well. 49 percent responded monitoring and support as 'good' while another 49 percent responded as 'very good'. Monitoring and support often comprised helping the groups start work, going around at intervals from group to group guiding, assisting, probing and prompting ideas, acknowledging and encouraging efforts and good work. When work went beyond the class hours, the groups were encouraged and welcomed to avail themselves of my services as and when felt necessary. Progress on the works was checked, and sometimes, group leaders were called to report on the progress.

2.5. What does it take for a group to work effectively?



a) Space in the class

b) Comfort in the class

Figure 2: Kept facilities to support group work

Physical space for movement and comfort of students in the class has been taken as important elements that would impact quality of group work. Generally, the classes in the College consist of 30-35 students on an average. In the two classes that I carried out the survey, there were 35-36 students. Students sat in groups of 5-6 by pulling their tables together. This allowed some tables to be removed thereby creating more room in the class.

Generally, the space in the class seems to have been good to support comfortable sitting and movement in the class (see Figure 2). I would, therefore, like to continue arranging the class in a similar way. However, almost 20 percent of the students felt that the spaces were just enough. It could have been the response of the groups located towards the back of the class, closer to the walls. I will try rotating the sitting arrangement of the groups so that every group gets the opportunity to use the space in front of the classroom.

2.6. Drawbacks arising from group work.

	Diversion of time, energy and resource	Felt frustrated or aggravated	Felt insufficient credit given
Yes	26%	17%	17%
No	74%	83%	83%

Table 4: Group work and drawbacks

While some of the students at the College are boarders, some are day-scholars. They have a wide range of other obligations and responsibilities as students learning to be teachers. Therefore, working in groups might not have been always pleasing and convenient. It would have required them to make a lot of adjustments and sacrifices.

It is also a matter of concern to find out that 26 percent of the students feel the diversion of their time, energy and resource, 17 percent feel frustrated and 17 percent feel they were not given the deserved credit for their work (see Table 3). The problems with the scheduling of meeting time, equitability of the divided tasks and individual differences in beliefs and work ethics would have undermined the low standard of achievement (Kriflik and Mullan, 2007). Soderman (2005), advocates reviews and feedback of work in large groups while small groups could be made to do actual works and individual works done own their own in the absence of the teacher. Soderman's (2005) advocacy stands a chance of reducing the pressure of time, energy and resource and keeping frustrations at bay.

2.7. Suggestions to the lecturer

Students have suggested pair work in addition to group work with 4-5 students. Supply adequate materials to the group. No enough materials makes people not want to work and want teachers to do the group work distribution (I feel that our students still want tailor-designed activities). Giving group work during the class hours and individual works for homework would be better. Maintain strict timeline for group work. Consider individual abilities and weaknesses to make a good group. Ensure that all group members take turns for presentations. Acknowledge and reinforce those members working hard. Assessment should be on individuals and not on groups. Follow up and feedback done well after group work and presentations. Organise group work hereafter too for there is lots of discussion and interactions and hence learning.

3. Conclusion

Students generally seem to have a positive attitude towards group work (see Tables 1, 2 and 3). The few unsatisfactory cases expressed by students in certain areas of organising the group work needs to be taken care of. A proper planning and execution of the plan has a high possibility of making group work popular as a strategy. In a Tertiary Institute like Paro College of Education (PCE), where independent learning is emphasised, group work could be highly relevant to students. However, the purpose of group work, strategies to assign students to

teams, assisting students to organise and share workload and involving students in peer assessment of group work needs to be identified (Kriflik and Mullan 2007).

Gauging students' opinion on group work, they believe that group work activities support and enabled them to develop personal and social skills, values and attitudes. Group work activities also enable students develop interpersonal relationships and communication skills. Although students seem to understand the value of working as a group, the drawbacks from group work as indicated in Table 4 (Yes percent) is quite alarming.

Going through the suggestions for consideration and improvement by the future teachers, they demand the teacher to coach students on group work skills such as division of work, time schedule, resource management, respecting social values, and taking responsibilities seriously. Therefore, as Soderman, A.K, et al. (2005) recommends, the role of the teacher of being a mediator, structuring time for students to interact with their learning process have to be put to action. The students might have to be made aware of the process involved in group work and the cohesive environment required for group dynamism. Considering the common goal for a group, trying to differentiate individual effort and contribution and thus assessing them based on the amount and value of their contribution is often difficult. Even upon trying to find out from other members on the contribution of each individual, the value of social conformity restricts honest and accurate feedback.

This paper just presents half of what should make a circle. The paper leaves a lot of questions and solutions to be sought after than provide a concrete solution to the problems arisen in the whole process of implementing group work as a strategy of teaching 'Teaching of Primary Science'. The findings from the survey, gaps spotted, suggestions made by the participants, and commitments that I have made in the result and analysis section and conclusion would be tried out, more useful strategies and solutions in enhancing successful implementation of group work as a teaching strategy would be for.

Comments, suggestions and criticisms on this piece of work, and experiences by the invaluable readers would be highly welcomed and appreciated anytime.

4. Acknowledgement

I would like to thank the B.Ed English Primary (Sections A&B) of 2006, Autumn Semester for being kind enough to participate in my survey and for providing honest valuable opinions and comments.

Thanks are also due to the Department of Science and the management, PCE, for always supporting and providing the space for such studies.

The presence of Centre for Educational Research and Development (CERD) next door is inspiring and encouraging.

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SPORTS AND PHYSICAL EDUCATION: BUILDING MUSCLES FOR THE NATION

Lungten Wangdi[7]

'*Physical Education looks after the child; sports look after the game; together they look after the future of children'. (Murcoch, 2000:69)*

There was a time when 'academic' meant 'the development of the mind.' Today, it seems to mean 'anything that occurs in a school'. The conventional Bhutanese school vision mentions the holistic education but the goal of education is often dominated by development of mental powers, at the cost of other developments.

Prior to 1990's, the teaching of values, ethics, and general socialisation of an individual was left to home and community. Schools did not institutionalise these goals (except through disciplinary policy). Schools did try to 'civilise' students, that is, to suppress their innate savage nature and encouraged them to behave well. Now, schools assume responsibility for the 'development of the whole individual,' for instilling social skills, teaching good health practices, and drug education.

Educational philosophies change like a swinging pendulum that swings too far to the extremes in either direction and spends the least time in the position of potential stability. It would be refreshing if the pendulum swung back to the position. The former Health and Education Minister, Lyonpo Sangay Ngedup, initiated and laid emphasis on the new dimension of education, particularly focusing on the Health and Physical Education to reinforce the academic standard.

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The sound mind and the sound body

A Greek belief says: **'*CORPSE SENA MERA SENA*',** a sound mind in a sound body. In an ideal world, the school education is focused on the wholesome education with the integration of sports and Physical Education. Practically the Bhutanese educational leader and the curriculum designers should not deprive the children of the 'MOVEGENIC' curriculum. The principal goal now is to make our modern educators and policy-makers stop this hiccup. Make sports, Physical and Health Education one of the core elements of the Bhutanese curricula. An Oriental saying, says, 'when the old cock crows, the young cock learns'. We need learn from those who have already begun and build healthy citisens for the future of Bhutan. Kipling (1983: 87) stresses the importance of fitness and health in Nation Building.

'Nations have passed away and left no traces.
And history gives the naked cause of it –
One single, simple reason in all cases,
They fell because their people were not fit.

Nothing on earth-no arts, no gift, nor graces –
No fame, no wealth –outweighs the want of it.
This is the law which every law embraces –
Be fit-be fit- be fit! In mind and body be fit.

This is the lesson at all times and places –
One changeless Truth on all things changing writ
For boys and girls, men, women, nation and races
Be fit-be fit! And once again-be fit!.'

In an ideal curriculum

In times gone by, the great scholars like Plato had an ideal curriculum. Plato would spend equal amount of time and effort on the two aspects of our being: mind and body. Mind courses would be theoretical, while body courses would be physical. If they had 128 credit hours in the entire programme, 64 would be devoted to the development of mind, while 64 would be devoted to body. But the purpose of both is to develop character. Specifically, one would have a programme devoted to the liberal arts (general education) for the mind, and the other would have a programme devoted to the physical arts (physical education) for the body. At present, the United Kingdom government is being urged to give children more opportunities for unstructured play. The National Association of Playing Fields has launched a campaign to promote awareness of the importance of play. The people of Great Britain have written to the Education Secretary, Mr David Blunkett, for help to prevent children growing up into a generation of robots.

Accordingly, the Education Minister in the UK stated that the school playing fields were an invaluable resource and one to which this government attached the highest priority. Similarly, many nations such as the United States of America & Australia have found sports and Physical activities centrally important for nation

building. It helps them curb the swelling health expenditure. It provides an outdoor classroom and adds to local people's quality of life.

The importance of play

To adults, it may seem that sports and physical education activities were not particularly important. But child development specialists say that they are crucial in cultivating creativity and imagination, as well as expanding intellectual, emotional and social skills. (Kamlesh: 2000). Jane Healy, a psychologist and educator, says too many parents and policy-makers just do not understand the importance of play in children's development. The children of yesteryear are the worthy citizens these days. They have a sense of hard work, innovation fair play and comradeship. The William brothers flying kites are seen as one of the air flights. England remained as Great Britain because of Arthur Wellesley; the Duke of Wellington who won the battle of Waterloo from the playing fields of Eton University - a victory Wellesley
attributed to the athletic training some of his soldiers received at the English boarding school. The war against the militants (ULFA and Bodo) in 2003 was led by a man who was a goal keeper and the team captain of Bhutan national football team in 1970's: His Majesty the fourth Druk Gyelpo.

The Holistic education

Learning multiplication tables and the alphabet are very important. But those skills need to reside inside a mind that has been expanded by the imaginative and joyous exploration of our environment and the possibility that it offers for fun. Play can be hard to define because it takes many forms, from physical play to mental play to imaginative play. The lack of sports and Physical Education in the general education is ignoring a lot of their development. That is because play is the way in which children work out their emotional issues, their fears, their anxieties. It is the way in which they develop a sense that they are important people who have ideas to share and who can get along with other people. However many parents believe that there must be programme directors for their children's intellectual development, not for their physical development. Children, of course, have been playing for centuries. Jean Piaget supported the importance of playing in children's development. Children are not empty vessels to be filled with knowledge but also need to be active builders.

The general attitude towards playing in Bhutan

According to CAPSD (1999), 'The common attitude of our people is that any activity outside the teaching and learning at school hampers the academic performance', Kezang (2000:1) remarked that the general Bhutanese attitude was a hurdle towards implementing a successful Physical Education curriculum. However, studies have proved otherwise. The American council of education (2005) and Sandhu (2004) studied bodilykinesthetic skills a form of intelligence. The studies found out that movement occupies a central position in human activity and it is a central feature of learning. A functioning in both sensory and motor aspects of bodily activity comprises the principal focus of the infant's early knowledge and

experience of the world. Scientists who study the brain discovered that motor behavior has no correlation with lower mental functioning. However, there is an important function of bringing refinement, sense of direction adaptability and survival value to the human organism.

The situation of Bhutanese Physical Education and sports

Bhutanese Physical Education and sports are not undergoing much change. The initiative of Lyonpo Sangay Ngedup as Health and Education Minister helped a lot, but the general misunderstanding of Physical Education and sports, even among many senior educators and elderly citizens, has not encouraged its growth. Currently, it looks like a hidden curriculum, marginalised.

The American council of Health and Physical Education (2005) reported the situation of Physical Education in perilous situation in many countries. The Bhutanese Physical Education situation is not different. Its status is lower than other subjects. Its value is not fully recognised by the authorities. The leaders in Education should study the need for building a strong nation. Government policy-makers need to deliberate on and implement sports and Physical Education to help achieve the Bhutanese vision of Gross National Happiness.

Conclusion

Sports and physical activity are not just talking about the game of sports. It is about the game of life. Every school that is serious about character education should have good Sport in its toolbox. Grantland Rice (nd), affirmed that sport and physical education teaches to play well the game of life. The firsthand observation is that sports can build character or undermine it; foster fair play or dirty play, honest competition or win-at-all-costs. It promotes teamwork or selfishness; self-control or fits of rage; the ability to win and lose gracefully. With Health and Physical Education we can assure and be grateful that we have a programme that capitalises on the character-building potential of sports. Every school in Bhutan that is serious about holistic education should have Good Physical Education and sports policy.

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Centre for Educational Research & Development (CERD)

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Serving Educational Progress

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- To foster a culture of enquiry and investigation in the continuous search of knowledge through research, publications and professional community development activities and by engaging in regular interaction with research centres and institutes of repute;

- To support and undertake comprehensive and systematic educational research and developments activities aimed at bringing about improvements in our education programmes;

- To study the current educational practices and developments in relevant fields and provide findings to the ministry and the university for consideration of policy options in relation to relevant educational goals, content, and methodology;

- To provide a forum to educators and researchers by supporting action-research for reflective practices and professional development initiatives for enhanced performance by our education stake-holders;

- To promote a national pool of scholarship and professionalism in the best traditions of educational research and development, for the flowering of the Bhutanese mind.

The major thrust areas of the Centre are research, publications, and professional support.

Some of the projects undertaken by the Centre, so far:

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- Launch of Rinpung Experiment, 2001.14 series completed so far.

- CIDA-supported Project on the Standard of English in Bhutan, 2002.

- Publication of The Silken Knot: Standards for English for Schools in Bhutan, 2002.

- Launch of Rabsel – the CERD Education Journal, 2002.

- Publication of The Call – Stories of Yesteryears, 2002.

- Preparation of The Silken Knot – Standards for Mathematics for Schools in Bhutan, 2003.

- Profiles of High School English Teachers: Issues and Concerns, 2003.

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- Trend Study in English Language and Grammar: A Look at Class X English, 2005.

- Gender Difference in Mathematics Achievement: A Bhutanese Perspective, 2006.

- Publication of Sherig Saga: Profiles of Our Seats of Learning: A Centenary Tribute

- Publication of View & Vision—Stories of Success, Examples of Good Practice.

- The State of Our Nation's Teachers: An Enquiry into Teaching as a Profession in Bhutan, a nation-wide study on the quality of teachers.

Professional Community Support:

Review and Revision of the English Curriculum, SSEB-MoE Project.

National Education Assessment, World Bank-MoE Project.

Production of Bilingual Dzongkha-English Dictionary, DDC Project.

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