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Notes for an Editorial

This Autumn Issue of Rabsel: the CERD Educational Journal brings together several critical concerns affecting education today. Action Research for our education system. Dr. Maxwell's paper highlights the place of and procedure for action research in our context.

Bhutanese Girls' Attitude to Science and the Impact of Science on Career Choice by Mr. Sonam Rinchen brings to light a host of issues on a significant area that is often taken for granted. The recommendations for all relevant stakeholders beg particular attention.

Values are an issue we have been grappling with all along. It is in the fitness of things that we have Dr. Jagar Dorji discussing the critical importance of Fostering Values and Traditions in our Schools and suggesting several practical ways to conduct classes on values.

The prospects and problems of Implementing the Health and Physical Education Curriculum in the Primary Schools in Bhutan are the concern of Mr. Kezang Sherub's paper which clarifies some long-held misconceptions and places physical education in its proper context.

A Tracer Study on the First Batch (2002) of B.Ed graduates of the NIE, Paro, by Mr. Dorji Wangchuk, brings to the fore several insightful discoveries and calls for concerted and immediate action to address the concerns.

A special entry is the Eco-Taxonomical Study of the Natural Population of Hogweed of Bhutan by Mr. Sadruddin, highlighting the commercial potential of this often neglected plant.

Beginning witht his autum Issue, we intend to include a portrait of an institution in the future publications of Rabsel. This is time round, it is Sherubtse _ a dream runs through it, by alumnus Mr. Tshering Gyeltshen.

Perhaps, the papers ask more questions than provide answers. In this special engagement called education, we never tire of asking questions. Indeed, it is in the nature of education to raise questions and put in proper perspective what is truly worthwhile in the enterprise and what we can well do without.

We are here in education on trust that we understand the true function of education and that we can rise up to this overwhelming challenge. Little wonder, education is often referred to as the noble sector.

Thakur Singh Powdyel
Director

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Action Research for Bhutan

- T W Maxwell, Ph.D
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Introduction

There is a growing interest in action research in Bhutan. This is not surprising since it is such a flexible process, amenable as it is to a wide variety of questions and situations. It is not highly resource-dependent but depends upon the resources and capacities of the people involved. 'Action research' is attributed to Kurt Lewin (1946) and it was he who popularised the concept after fleeing Germany and working with disadvantaged groups in America.

'Action research' is a contested term, however. It means different things to different people. For example, some evaluations are considered action research and reflection-on-action reports have been written up as action research. In this article, a more rigorous form of action research is discussed in which the *systematic collection of data* in order to *answer a research question* for the *purpose of improvement* are key ideas. This paper proceeds by asking the questions *what*, *why*, *when*, *who*, *where* and *how*, with an emphasis on the last. By this process, key issues about action research are identified. The article concludes after a consideration of its known current use in Bhutan (1998-2003) and an example from Bhutan. I have also introduced 'action research' as a compulsory unit in the pre-service BEd programme at UNE, Australia (see Maxwell, Reid, McLoughlin, Clarke & Nicholls 2001).

What is Action Research?

While there are many definitions of 'research' in the social sciences (and elsewhere), research is essentially a process of posing questions and gathering and analysing data with the intention of finding answers. It is not always as straight-forward or even as linear as is suggested here. Nevertheless in research, we are trying to find answers to questions that interest us.

The introduction of 'action' in association with 'research' to form 'action research' is significant. 'Action' in this sense is purposive, that is, the research is directly linked to action to create improvement. The research is undertaken *during* action and so has similarities with reflection-in-action (Schon 1995) and evaluation. Action research, however, is different from reflection at least in the sense that action research is more rigorous (eg systematic in the ways that data are collected over time). In action research, the focus is upon research, i e, finding out something new, not on the worth of something which is the focus of evaluation. However, action research itself needs to be worthwhile and reflection is usually an important part of action research.

Why do Action Research?

In the previous sub-section 'action' implied a purpose. That purpose is improvement and on this there is general agreement in the literature. Grundy (1995, 9) indicates action research can lead to improvement:

1. in practices (e.g. facilitating children's learning),
2. in the situation (e.g. re-arranging the room), and
3. in understanding of both (of 1and 2)

This firm position on improvement is consistent with the ideal of teaching as a service, as work done for the good of others.

Action research in situ works from teachers' (and others') perceptions and takes into account realities located there. This means that the questions and the findings are not imposed but come from the work of the Bhutanese teachers themselves. Doing action research also means that the results are pertinent to a Bhutanese situation. When action research reports are written, they are more likely to be understood by other Bhutanese since the research is located in the specific realities of Bhutan, not in other countries.

In writing an action research study, the aim is not to generalise but to create a written account that is robust enough for others to make sense of. As Stake (1976, 7) indicated "readers recognise essential similarities to cases of interest to them, they establish the basis for naturalistic generalisations". Stake says here that it is the reader, not the writer, who makes the generalisation (from the case to the reader's own situation).

We can summarise. Since action research is all about improvement, it is an important process to facilitate the professional development of teachers (Grundy 1995). It is not the only way to do this (see for example, Frid, Redden & Reading 1998) but it is a focussed and situation-specific way. More than this, whole school staffs can be involved. Going further still, Kemmis and McTaggart (1988) argue that action research is at its best when emancipatory action takes place where all those involved are affected.

Who is involved in action research?

The people doing action research are the central figures but often others are involved as collaborators. Those asking the questions and trying to make improvements can be individuals, small groups (eg, Class 4 section teachers of English) or even large groups (e.g. the staff of a school). Action researchers need to understand that they have a dual role - as teacher and researcher.

Sometimes action researchers have to work alone but in doing so they might suffer from myopia, that is, a short-sightedness derived from being too close to the action. Being 'too close' can often mean, for example, that important data are missed or

interpretations are narrow or even biased in some way. To counter this (and for other reasons) action researchers are often accompanied by 'critical friends'.

The term ‘critical friend’ is well chosen. A critical friend is one who can ask awkward and/or difficult questions and yet do so in such a way as to maintain a close working relationship. Critical friends will ask action researchers to check out their assumptions, to question what is taken for granted and to wonder about the meanings of metaphors used, for example.

Sometimes an action researcher *has* to work alone. Some key workers in the action research field (e.g. Kemmis & McTaggart 1989, Grundy 1995) consider this far from ideal. They argue that since action research is a social practice, it requires multiple perspectives to be brought to bear upon the meanings being developed, and through interaction progress is attained.

When is Action Research undertaken?

The important point about timing is that action research takes place during normal lessons. As already indicated, the research takes place as action researchers attempt a process of improvement. Action research requires a prior question and the systematic collection of data over time, the analysis of which will hopefully lead to a rational judgement about what these data mean. Hopefully, the analysis will lead to answers, but if it does not than this is not necessarily a problem since the analysis will often suggest ways forward, perhaps leading to another cycle of AR.

The action research process can vary in time depending upon a variety of factors. For example, a complex question would likely require more time. The addition of more people into the action research group is likely to add to the complexity and hence to the time taken. The situation can vary from more simple to highly complex interaction of individuals within a situation. Action research can last for an hour or so, to a year or more. My students and others find that an action research cycle can take four to eight weeks in the classroom situation.

Where is Action Research undertaken?

Action research also implies a particular setting or situation, that is, the research is undertaken amongst the real world of people, places, time and resource constraints. This is a particularly important aspect of action research; action research has to take into account, and deal with, these realities since AR takes place in the thick of improvement efforts while other demands of practice are still taking place. For example, my BEd students often focus upon behaviour management as the source of AR questions, but they understand that the AR is undertaken while they are teaching particular subjects such as English, maths and so on.

Action research is *not* done by someone from somewhere else on somebody else. The action researchers are in control because they is interpret the situation, formulate the question, create the action, and collect and analyse the data with respect to a specific situation in which they find themselves.

Of course, the situation varies depending upon the area of interest of the person(s) asking the questions. A teacher might be expected to ask questions that lead to improvements in student learning in her classroom (either by improving her actions, the learning situation, or both). A school head teacher is more likely to have school level concerns such as the improvement of mathematics test results at Class 12. An Assistant Dzongkhag Education Officer (ADEO) might be interested in the development of multigrade teaching practices across the Dzongkhag, and so on. In either case, the process of action research remains connected to the situation and the initiator of action research will sometimes (perhaps preferably) draw those involved in that situation into the action research process.

How is Action Research undertaken?

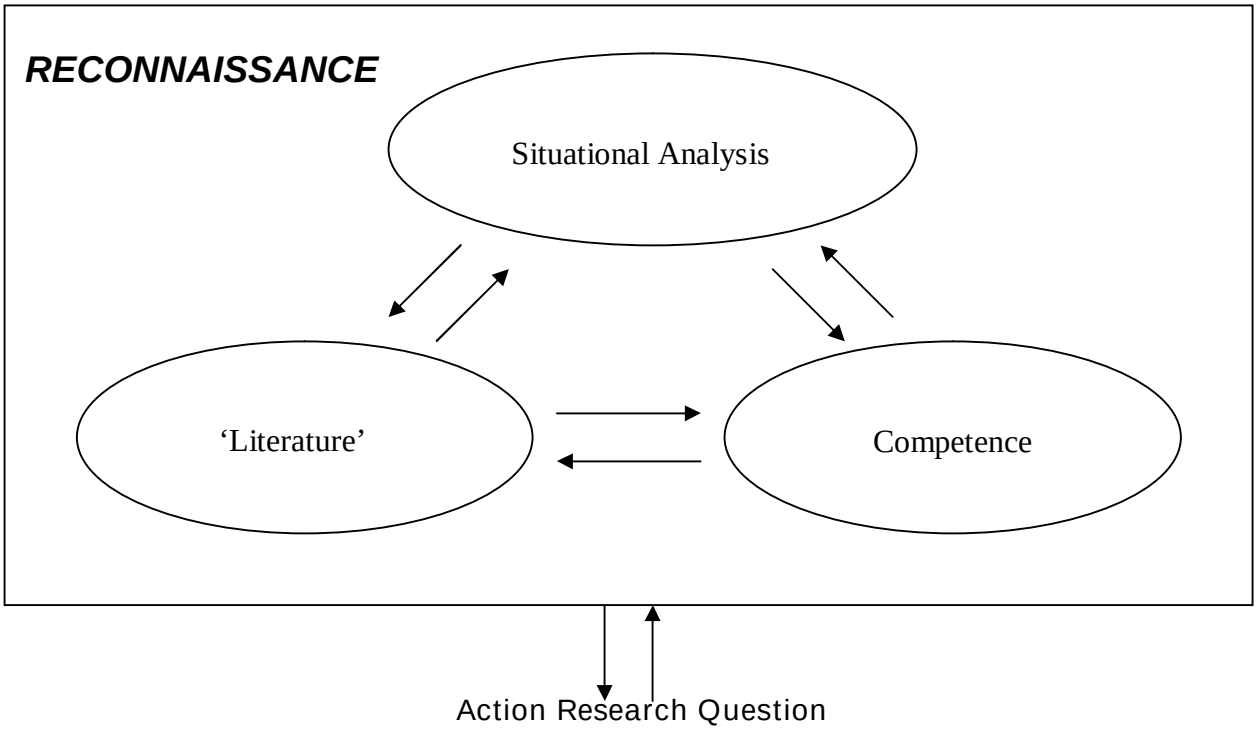
There are many models of the action research process (e.g. Johnson 2002, 39-41; Elliott 1991, 70-1). Here I am using 'model' as a guide to action. In my work, I have found it useful to divide the process into two related parts, viz, the reconnaissance for action research and the spiral/cycle of action research. I thus follow the Kemmis and McTaggart (1988) model but with elaborations. The reconnaissance phase is essentially diagnostic; the aim is to go deeper into the situation so that you end up with questions that matter rather than superficial ones. The action research question links the reconnaissance to the action research spiral of planning, action, observing and reflecting (Kemmis & McTaggart 1988). Let us unpack each of these phases:

i. **Action Research Reconnaissance**. This is derived from a French word (reconnoitre – to look at) and has connections with warfare (to survey the scene to find out strategic points of interest). I have come to think of reconnaissance as consisting of three parts (Maxwell 2001) namely situational analysis, analysis of competence of the people involved, and 'literature' (see Figure 1). Together, these comprise an overview that will encompass the realities of the situation in terms of resources and practices (situational analysis), the profile of competences of key players (competences) and a connection with previous work in this and related areas ('literature').

It is quite common in a situational analysis to collect data to assist in further specification. These early data (eg. a test on Class 3's reading comprehension) can be used for comparison of results obtained at the end of the AR cycle concerning reading comprehension. I use parentheses around literature to signify that knowledge can be found in texts, but also from the experiences of, particularly, advised practitioners. In other words, academic knowledge is not privileged over professional knowledge (cf. the new sociology of knowledge, e.g. Gibbons, Limoges, Nowotny, Schwartzman, Scott & Trow, 1994).

It is important to note here that these three components are interconnected and usually completed over the same period of time (contemporaneous). The double-headed arrows portray the inter-connectedness. The boundedness of the reconnaissance box is suggestive of contemporaneity and the specification of a situation.

Figure 1: Reconnaissance and the Action Research Question



The object of Reconnaissance is to produce a research question that will lead to improvement. Sometimes an "if ... then ..." statement is useful. For example, "If I read big books showing the connections between the pictures and the words, then will the comprehension of English improve? There is a double arrow to the question from reconnaissance in Figure 1 because sometimes the question is too broad (e.g. ''how can I improve English in my classroom?') and this leads to a return to the reconnaissance to further specify. In fact, criteria for the selection of the action research question could be:

1. specific (can I gather data about this?);
2. strategic (will it make a difference to my practice or the situation or both?); and
3. do-ability (can I possibly change this in the time given?).

Experience with my students suggests that the definition of the action research question is difficult. However, the AR question is derived *out of* the reconnaissance. In this way, the research is grounded in classroom realities.

Kemmis and McTaggart have introduced the term 'thematic concern' to accompany the formulation of the AR question. This can be useful because it points out to the more experienced teacher/researcher what the broad focus of the research entails. Some of my BEd researchers are not always sure what they want to research amongst a number of choices (multiple thematic concerns). I ask them to work hard within the reconnaissance to find an idea that will lead to improvement in the (short) time available. It is the careful selection of the action research question that links the reconnaissance to the action research spiral.

ii. **Action Research Spiral.** The action research question drives the action research spiral. The spiral has four 'moments' (Grundy 1995; Kemmis & McTaggart, 1988). First, we will investigate each of these 'moments' that are classically depicted in Figure 2. [As indicated, there are other formulations of the action research spiral or cycle, but the Kemmis and McTaggart model has been widely used, and is well documented.]

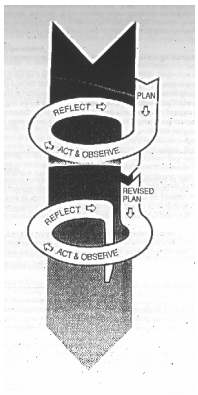


Figure 2: The Kemmis and McTaggart (1988) Action Research Spiral/Cycle

"Plan" implies working out ways that might, individually or collectively, result in improvements by taking certain actions. The planning of the gathering of data is also important to do when the actions are planned. (You can't act first because you won't have any data about whether you have been successful or not unless you plan beforehand.) Since in research systematic collection of data is desirable, planning facilitates this collection (and analysis). The 'moments' of action and observation largely go together. We observe (gather data) as we implement the plans for improvement (action).

Action (that we are interested in) invariably takes place alongside other action, that is, action research is embedded within the realities of the complexities of the situation and other practices. This strengthens the action research process, but it certainly adds to its difficulty. For the purposes of action research, the data are extracted and analysed in the context of these realities. Meanings of the data will be searched for as the data are gathered. That is, reflection will normally take place during the action also, but it is important to suspend judgment until the data trends are evident. The reflection moment focuses upon a sustained period of thought (and often discussion with others and the critical friend) about the meaning of all of the data. Thinking about the data requires analyses of these data, often with the assistance of a conceptual framework derived from the 'literature' (e.g. in behaviour management, there are the languages of correction, reinforcement and expectation (Richmond 2002) as a way of 'seeing' behaviour management).

A note here about data gathering and their analysis is important. It is not possible in this article to go into these issues. Whole books are written on both and action researchers should have access to standard research texts. In Bhutan, this will not be possible in most situations. But research is still possible since teachers are taught

how to gather data as a matter of professional practice. Tests are the obvious sources of data, but there are also interviews, observations (recorded in diaries), portfolios of students' work and checklists. Suffice to say here that action research, like all good research, requires the action researchers' to collect quality data and to analyse them carefully. In action research, data is needed over time, that is, trend data are needed often using baseline data from the situational analysis.

A simple way of thinking of gathering data over time is to do so in the beginning (baseline data), in the middle of the cycle and at the end of the cycle in order to produce a trend. An action researcher will be hoping for a positive trend indicating improvement. Preferably, action researchers get (three) different kinds of data so producing (three) different trends.

For example, we might ask the question: "How can I improve spelling in my Class 1 and Class 2?" Data collected at the beginning, middle and end of the cycle could include tests, data from asking children if they like spelling and an analysis of a portfolio of selected students' work to see how they use the spelling words. Here, three different trends would be produced and the job of the action researcher is to make sense of these trends and to work out what to do next.

At the end of a cycle

Many action research models simply run the second cycle on from the first cycle. The prior discussion showed that an action research cycle is more complex than the model shown (e.g. Figure 2). So, too, the continuation from the reflection moment is not straight-forward.

In order to explore this idea, we need to combine Figures 1 and 2 to show the connection between the two and then the complexity. The action research question links the two models (Figure 3). Once the significant action research question has been specified and the effects of addressing this question look like improvement will result (do-ability), then the planning can begin because the question resulted from a thorough reconnaissance.

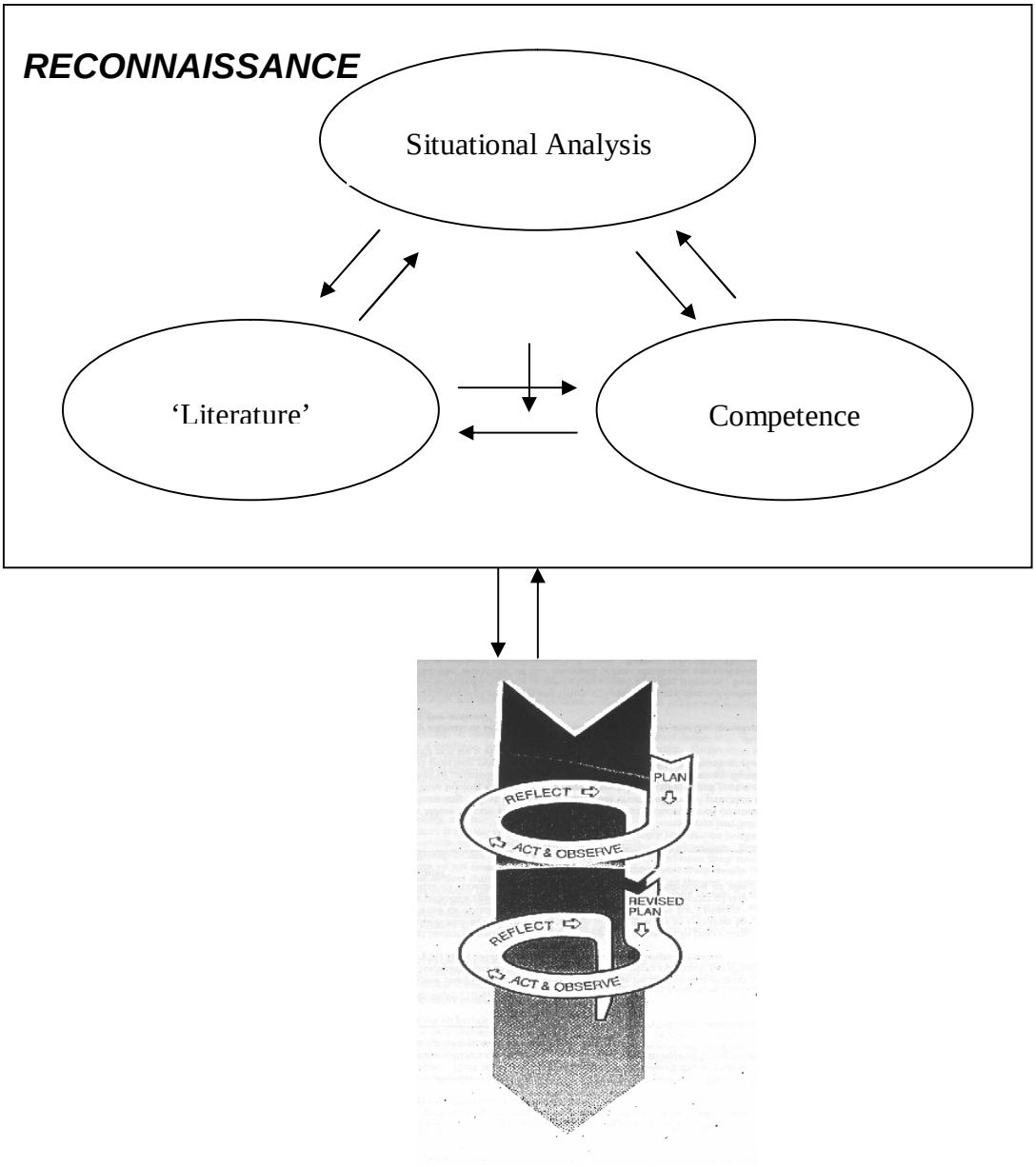


Figure 3: The Reconnaissance and Action Research Spiral linked by the Action Research Question after Kemmis & McTaggart (1988).

The potential answers to 'what happens after "reflect"?' are given below and we shall go through each in turn.

1. You can decide to stop at the end of the reflection. Reasons for this could be success or dissatisfaction, though the latter really requires further thought. Initial dissatisfaction could lead to success with perseverance in another cycle.
2. After reflection, you might decide to go back and get more data, that is, implement plans/act some more. Essentially, the reason for taking this option

is that your reflection may well have given you conflicting ideas, your data is inconclusive or you want confirmatory data.

3. It is possible that your reflection may lead you to think of another question that you want to pursue. Your first cycle might or might not have been successful, it's just that now you have another question that interests you (and so a second cycle begins).
4. You might want to try something different from the first cycle in terms of action so you have to plan again. The question remains appropriate.
5. After reflection, there are quite a few reasons why you might need to go back to the situational analysis in the reconnaissance (and you might need to re-address the 'literature' and competences in an interactive way). Typically, the action researcher might have mis-diagnosed the situation.
6. The "literature' not only are sources of good ideas but also of conceptualisations. You might have not been successful in your first cycle and be bereft of new ideas. The 'literature' (professional advice and texts) can help here. Alternatively, your first cycle work might cause you to ask deeper questions and/or a need to find new ways of thinking about (conceptualising) your question of interest. You just might want to read around/talk about the area too.
7. Option 7 can result when the action researchers are forced to look more carefully at their competence or specific competency sets. Reflection on data indicates that the new area requires a competency focus. We do, after all, have control over our own actions (and can only influence others).

Action Research Case Studies in Bhutan

From 1993, rural and remote teachers and principals have been coming to Australia to learn about multi-grade teaching as part of the Bhutanese Multigrade attachment Project (BMAP, see http://fehps.une.edu.au/f/d/edu/Bhutan%20site/home.html). Since 1998, we have been using action research as a way of finding out if ideas that Bhutanese teachers have adopted and adapted from Australia have lead to any improvements.

Despite the fact that the introduction to action research is extremely short (and data gathering and analysis are scarcely addressed), there is ample evidence that action research has been effectively implemented in Bhutan within BMAP. This is not to say it is easy (teachers are busy people in complex situations) but some BMAP teachers were able to show that they were able to make improvements (UNE 1998, 199, 2000, 2001, 2002). What follows now are some examples drawn from BMAP. (Names, situations etc have been changed so that individuals and schools cannot be identified.)

> **Case #1:** Four cycles were used to develop different forms of grouping and related teaching strategies from a base that was essentially ability-grouping. The final cycle involved a combination of grouping, extended activities and contract learning. A complex evaluation ("Observation" + "Reflection) indicated different grouping strategies worked at different times but social groups did not work in the small classroom. Lack of materials meant that a considerable amount of time was spent in blackboard writing. Extended activities and contracts worked well (UNE 1998, 6).

Case #2: Four groups were organised to develop four projects based around a visit to a nearby monastery. The children were interested and they "displayed their work in the classroom and introduced their work to the observer very proudly" (UNE 1999, 6).

Case #3: Students were encouraged to use the reading corner which had the small collection arranged by reading difficulty so that children who finished early could read for pleasure (UNE 1999, 6).

Case #4: Teachers were organised to gather data weekly on a range of activities - student character, health and hygiene, hardworking, sports, speaking only Dzongkha and English during school hours and contributions to wall magazine and news board, in order to gather data for the weekly commendation certificate. After some time, student interest waned and the teachers met and decided to institute monthly and yearly prizes and begin a second action research cycle. This rekindled student interest (UNE 1999, 8).

Case #5: Three cycles were used to develop the speed and accuracy of basic maths in Class II. These were excellently described, including the analysis of what the nature of the problem was before hand (UNE 2000, 10).

What I have described here is a thumbnail sketch of some of the reports that individual teachers wrote as a result of their action research on return to Bhutan.

Conclusions

Action research is a systematic way of reflecting upon a situation and changing it. More than this, action research (in the model proposed here) requires the identification of a specific, do-able and strategic question that has been derived from a thorough reconnaissance. In the model developed here (strongly based upon Kemmis and McTaggart, 1998), the reconnaissance consists of an analysis of the situation, of teacher competence and of the phase 'literature' (professional and text-based knowledge). Action research cycles are developed centred upon the research question that is being addressed. Seven alternatives to the simple continuation of the cycles (the apparent alternative from Figures 2 and 3 above) after reflection were developed.

A case was made that action research is an appropriate strategy for Bhutanese teachers. Action research is *highly* context-dependent and it is this feature, which lends itself to Bhutan with its particular history, resources base, and so on. Teachers who want to develop their practices, the situation or their understanding of these can do so, and action research is *one way* of making progress. Trying out ideas and using data as evidence to see if improvements have been made can be structures using the AR model developed above. The fact is there are few researchers in Bhutan. But even so, effective teachers can use action research on questions they themselves identify as important. The case studies from BMAP have shown this to be possible and illustrate that for some teachers action research is useful for them in their work.

As Bhutan proceeds to develop astride the development demands of the 21st century yet maintaining its own cultural traditions (Planning Commission, RGoB 1999), action

research can assist greatly by seeking answers to questions which address either or both of these. Furthermore, given Bhutan's short secular education history and the systemic demands of the provision of quality teachers and resources (as well as facilities), action research allows for improvements to be sought within current realities, including limitations (e.g. large class sizes and small classrooms) and potentialities (e.g. of the local environment). Developments in education really depend on the ability and enthusiasm of its teachers and teacher educators.

* * *

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[1] **Footnote** – BMAP had its 100th participant in 2003. Over recent years, 12 teachers have been spending about six weeks in Australia working at the University of New England and in two placements in schools. The main purpose is for Bhutanese teachers to identify practices and resources (ideas) that they might adopt or adapt back in their own school.

* * *

Bhutanese girls' perceptions of science and the impact of science on career choice.

- Sonam Rinchen.

Abstract

Very few girls in Bhutan pursue science at a higher level of learning despite the fact that the department of education in Bhutan encourages girls to do so. As a classroom science teacher, I was concerned with the performance of girls in science subjects. Therefore, I wanted to investigate why girls shy away from science though it offers a promising future. The purpose of this qualitative study was to describe Bhutanese high school girls' perceptions of the study of science and the effect of school science experiences on career choice.

The study was conducted at a residential high school in Bhutan. To collect relevant data, I interviewed two focus groups of six girls each for a period of six weeks using semi-guided interview protocol. The first group comprised of girls wishing to pursue science in grade eleven; the second group was girls who did not wish to continue with science in grade eleven. All the interviews were audio-recorded and supplemented with field notes. Findings were validated using triangulation and member checking.

These girls' experiences of studying science suggest that the critical factors that contribute to Bhutanese girls' liking or succeeding in science and its influences on career choice are: social and cultural practices, especially parental expectations, the effects of rapid growth of the school system, and a failure to recognize the importance of guidance and role models.

Introduction

In the past, most of the students were put in a dilemma - whether to follow the parents' beliefs or the teachers' instructions at school. Most of the parents in Bhutan have limited formal education, and faith and beliefs play a vital role in their lives. These beliefs are passed to their child, which are difficult to overcome and make learning science more difficult.

In the course of my teaching, I was frequently confronted by problems that acted as a barrier for girls to learn science. I have been a schoolteacher for five years and acknowledge that my own experiences contribute to the meaning of the environment that I create. These experiences are screened through my lenses. As a teacher, I taught science and the most frustrating part was that, for whatever reason, I was not able to achieve good results in my class in general, and with girls especially, even after putting in my best possible efforts.

This disturbed me and I used to question whether it had to do with my teaching instructions, curriculum, resources, textbooks, environment, or the kind of background from which the students came. Throughout my teaching career, I found girls to be sincere, both in terms of attendance and class discipline, but for some

reason they never scored high marks in science. I have had girls often say, “Sir, why do we need to learn equations in science and mathematics? What help is it going to bring us in the future? It is difficult to relate scientific terminology to daily occurrences.” Such questions have troubled me and lead me to wonder whether the studying of science has a positive or negative impact on students. Even as a guardian, I find it difficult to help my sisters with science–related work.

Science has always been thought of as a subject which is difficult to teach and learn for Bhutanese people. There is always a shortage of science teachers and science graduates, especially females, despite there being highly paid jobs in the area. The Royal Government of Bhutan (RGOB) has spent much time and money to enhance science education programmes in the country.

Still we find that only a small proportion of high school girls are entering the sciences. For example, the graphic analyses of girls and boys in 15 high schools in science at the Bhutan Board-Indian Council of Secondary Education ’99 (BB-ICSE) across the country shows that in every school boys performed better than girls by a margin of at least 2% to a high of 38% (Bhutan Board of Examination, 1999).

I would like to share another experience, this time from my childhood. I can vividly remember a day in grade five. Our science teacher asked a question to one of my female friends. The girl knew the answer but she found the terminology difficult to pronounce so she said she would write it on the board. Gradually, my friends, in general, and female friends in particular, discontinued school. Most of them had failed and the failure was attributed to their low marks in science subjects.

During my years as a student, and later as a teacher, many of my friends and students, especially girls, left school early for various reasons, albeit many of them had the aptitude to continue studying. As far as I am concerned, I always thought that leaving school early was playing with life and shattering the expectations of parents and teachers. Some of my female friends left school early because they had low marks in science, but some chose not to pursue higher studies in science even if they had the potential to be successful.

Some of my colleagues expressed the same kind of frustration as I did. They complained that girls have negative attitudes towards science and do not perform well. Therefore, this was always a concern of mine and I was interested in exploring this area. I wonder whether those teachers might be right; however without research evidence, it is not prudent to say that all girls have negative attitudes toward science. As I completed the study, I found my thinking reinforced in some areas and challenged in others. Nonetheless, as a science teacher, I sense that it is due to the lack of parental involvement, role models, career counseling and motivation in girls’ science education.

Background

Science classes reflect the problems that teachers, students, and society at large have been facing. Most science is learned in abstraction. Students are not able to apply the learned scientific knowledge to everyday problems, nor are they able to relate this

knowledge to their environment to make better sense of the world. Many students also fail to understand the importance of learning science.

In Bhutan, the BB-ICSE examinations are a filter through which students must pass to continue studies of science or other subjects. My experience has been that fewer girls make it into science courses, despite the fact that both boys and girls are given equal opportunities to gain admission into colleges and universities. Some girls accepted into science courses try to drop out. Science test performance scores, used by the Board in the schools to determine students' option choices, may not be the only suitable criteria to explain why girls do not pursue higher studies in science (Nenze, 1994). This situation may be the reason for the struggles these young girls are experiencing.

My experience as a teacher suggests another factor that may help explain girls' dislike of science. As students move to higher grades, the drop-out rate increases, most noticeably among girls at the secondary level. Often, this occurs after examinations and out of the remaining girls, only a few will qualify for university entrance. Factors like students' interest, motivation, attitudes, beliefs, and past experiences are rarely accommodated in such situations (Pintrich, Marx & Boyle, 1993).

In Bhutan, curriculum materials, literature and textbooks often show girls in passive or traditional roles. Research on United States history texts revealed that material on women comprised no more than one percent of any text and that women's lives were trivialized, distorted or omitted altogether (American Association of University Women, 1992).

Grenberg (1989) states that girls enter pre-school ahead of boys in the areas of impulse-control, small muscle development and language enhancement (as cited in American Association of University Women, 1992). Since many girls tend to achieve competency in these areas before they arrive in group-settings as school, teachers turn their attention toward boys whose development in these areas fall behind that of girls. According to my experience, this is quite true in the schools of Bhutan. When the girls enter school, they are quite enthusiastic and inquisitive about school and learning. But later as teachers and boys expose them to different treatment, girls try to shy away from school and fall behind boys.

Ever since schools were established in Bhutan, completion of secondary school was not a requirement for getting a job in the country. There was no dearth of jobs for those willing to work. Today the scenario is changing as the country passes thorough a social and economic transition. Bhutan is experiencing a revolution and new strategies are being developed in every field to keep pace with the changes taking place around the world. We are in need of workers with technical skills and are looking to schools for them. At present, fewer women enter fields than men. Men are not more capable but tend to be more interested. Women in Bhutan generally absorb themselves in traditional jobs like weaving with handlooms and managing grocery stores for a living.

This study aims to recognize the factors that influence Bhutanese females to choose science as a subject and a career. Today, as the country develops and the population grows, only the students with best academic qualifications survive, and preference is

given to those with scientific backgrounds. However, Bhutan cannot leave women out of science and technology, as there is a dire need for qualified people and to do so would dramatically reduce the available pool of skilled labour. So long as education is provided free of cost, it is ossible.

Purpose

Recently, Bhutan was introduced to the world of the Internet and other scientific developments. The jobs created by these developments often require scientific knowledge. Bhutan lacks expertise in this field and we rely on experts from overseas. Girls and young women are under-represented in science classrooms and in science-related careers in Bhutan. The cause needs to be investigated thoroughly. Previous research in western countries has confirmed that women and girls are under-represented in science, and such a situation prevails in Bhutan too. The issues contributing to these phenomena must be explored. In my personal experience as a science teacher, the importance of science to the daily needs of women and society suggests that it is critical to study factors that might encourage more girls to enter the field of science and technology.

There is a need to look at science studies at all levels of education in Bhutan. The reasons underlying the unequal involvement of girls in school; sciences have to be examined and associated problems attacked at their roots (Nenze, 1994). If not, girls will not be prepared to enter the adult world, where they will be expected to apply scientific knowledge in their traditional and agricultural roles. In Bhutan, the tradition has always been to pass or fail students on national examinations. Girls have always appeared on the losing side in science fields. Factors like attitudes, motivation, beliefs, and interest, should be explored.

Thus, the main purpose of this study is to explore the various factors, which contribute, to girls' liking and achieving in science and the impact of these factors on career choice. This preliminary study represents an attempt to identify and highlight the issues, which need immediate attention from all stakeholders, such as policy makers, teachers, and parents. Considering the rapid development occurring in the country, human resources in the scientific field are needed. While this study doesn't aim to provide solutions, it does help to provide insights into factors which contribute to the problem. Women, either as parents, housewives, or guardians, encounter science in their daily lives and therefore they should have acquired at least a basic knowledge of it in their formal or informal education. Moreover, because science-related jobs are regarded as prestigious and well paying in Bhutan, women could dramatically advance their social, political and economic status.

Women in science fields may be in a better position to understand the needs of other women, become role models, and encourage other women to follow their steps. The degree to which we understand the factors which impede girls' science learning is essential to understanding this problem. Studying these characteristics will help our Education Division encourage girls to take up science. This study will also aid in designing effective interventions that could help push more girls into this field and meet the needs of the human resource shortage in Bhutan.

Girls versus Science

In the Bhutanese education system, the parents, citizens, society, and teachers have low expectations of girls in the field of science and technology. In order to understand the problems faced by girls in learning science and pursuing a scientific career, I felt it was important to analyze related factors that contribute to their problems. I wanted to listen to these young girls as they expressed in their own words their feelings toward school science and science-related careers. I asked them in their groups about their experiences in school science, their attitude toward science and science based careers. Also, I was interested to understand whether they were satisfied with the science teachers, curriculum packages, assessments, the attitudes shown by parents about their studying of science, the lack of role models, and the influence of cultural and social beliefs on learning of science.

According to my experience as a science student and a science teacher, the above factors influence the performance of students in general and girls in particular in Bhutanese schools. This idea is further reinforced by the review of the literature based on the studies conducted in the west and other less industrialized countries.

In this study, I interpret the experiences of twelve girls about the realities they describe of their experiences in school science and the impact of school science experiences on their career choices. In order to present the most holistic views of the participants and to safeguard their voices, while at the same time maintaining the authenticity of their personal views, the exact words of the girls are interwoven with the narrative descriptions of the meaning I ascribe and very few changes have been made in the interest of clarity.

I entered the field anticipating different findings from the girls. I expected more positive science learning experiences from the first group, as opposed to the second group of those not wishing to continue with science. Even though these girls originally described themselves as liking or not liking science, to my surprise, their earlier experiences were similar. In fact, they had more similar experiences than different. The girls' early experiences reveal that most of them studied together in the same school or those who studied in different schools had similar facilities. The girls from both groups were exposed to the same teachers, curriculum, and other pedagogical instructions. Both groups seemed to have similar experiences in elementary school, as well as high school.

Most of the girls had a positive experience in the lower grades, despite resource constraints and a negative influence from cultural and social beliefs. In higher grades, most of the girls had been confronted with unfriendly teachers and rowdy boys, which made the classroom atmosphere inimical to girls. Lack of resources resulted in constraints on teacher pedagogy and instruction. The six girls who describe themselves as liking science were motivated by someone in the family who was aware of the importance of science and science-based careers as opposed to other six who describe themselves as not liking science.

Such initiative from the parents and relatives resulted in the development of a positive attitude in them, which led them to score better grades in science. On the other hand,

the other six girls did not receive enough motivation and were not aware of the importance of science and science-based careers.

This resulted in the development of a negative attitude toward science, and they were not able to do as well on test and quizzes. These girls' experiences in science are attributed to the fact that they came from the same school or from different schools, which had similar facilities in terms of teachers, pedagogy and resources.

Girls' perceptions of what influences their liking or disliking of Science

Teacher characteristics

The factor which most contributed to a like or dislike of science is the teacher, and deserves a special mention. Teacher characteristics are pervasive throughout all focus group discussions. There seems to be a greater impact on the girls' interest and achievement in science depending on teacher characteristics. Girl's disliking or succeeding in science is associated with teacher attitude, competency, and sex.

Teacher attitude

All the girls felt that teachers' attitudes tended to have a significant effect on their interest in science. The way teachers act has a great effect on girls' attitudes towards science. The teachers ignore their work, focus attention on a few or individual students, especially the bright, and ignore weaker students. Chhencho and Chhewang's comments are reflective of others feelings:

> **Chhencho:** There are some teachers who ignore our good work and give more attention to a particular group of students or individual. These discourage us and as a result we don't do well in science.
>
> **Chhewang:** Most of the teacher encourages a particular group of students and leave aside the weaker ones, which are mostly girls.

As a consequence, the girls feel left out of science as remarked by Chhoden:

> **Chhoden:** We feel discouraged and rejected as if science is not meant for girls.

Most of the girls are of the opinion that the teachers even tend to resort to partiality in the assessment too. For instance:

> **Chhewang:** Some teachers practise partiality by giving more grades to certain groups and fewer grades to others, despite their good performance. This kind of attitude in teachers has a negative influence on me.

Most of the girls preferred teachers who were impartial and influential in learning science. Here Sayden, Chhewang, and Chhencho caution that a teacher should be impartial, influential, and must treat everybody equally:

Sayden: Teachers should treat everybody equally, irrespective of their ability and sex. Their marking must be as fair as possible. They must teach slow and focus on students' understanding, rather than syllabus coverage.

Chhewang: The methods teachers adopt to teach should be changed. We want teachers to be active. The teachers should involve students in the teaching and learning process. The teachers should also stress more on activity-oriented lessons than to the lecture method.

Chhencho: Teachers should give tests every week to see how well students have understood, in order to learn their weaknesses and try to improve. They should give notes, as well as a chance to perform experiments individually so that students become familiar with the chemicals and the equipment, the students' home assignments should be corrected strictly. They should not practice favouritism and every one must be treated equally.

Teacher competence

The girls from both groups define competence as having teaching experience, a science background, a willingness to put forth effort, and using examples and language that are familiar. By teaching experience, these girls seem to mean those teachers who taught science before and are familiar with the texts and syllabus. All the girls remarked that teacher experience has greatly impacted the girls learning of science, as expressed by Choeney:

Choeney: A novice teacher taught me when I was in grade VI. He was incompetent because this was his first teaching experience. He was not familiar with the text and syllabus so he ended up teaching bit of everything and not what is exactly asked by the syllabus.

Sherub further highlighted the notion of teacher lacking teaching experience.

Sherub: I was not able to do well in science because my teacher was fresh and didn't have much teaching experience; as a result his teaching was not very effective.

For these girls, a teacher needs to have both a science background and some teaching experience. Most of the girls expressed that often a class goes without a science teacher for the whole year or a non-science teacher ends up teaching science subjects.

Chhoden: Whenever teacher takes a long leave, they are substituted by somebody who has less teaching load. Sometimes a teacher whose background is not science is made to teach science. This has impacted our liking and succeeding in science.

Sangay expressed that she was doing better when her teacher had enough science background. For example:

Sangay: In grade VI I used to score high marks because my science teacher was interesting. That was my first year experiencing science and I was interested in it. Also in grade VII the teachers were good and I gave more attention to science.

According to most of the girls, teachers who put in effort in structuring the lessons and creating a lively atmosphere are considered competent. Most of the girls stated that some teachers were lazy and did not put adequate effort into panning lessons and making them interesting. For example, Sayden attributed the poor quality of learning to inactive and lazy teachers:

Sayden: In grade seven, my science teacher was boring. He was too slow and never use blackboard. He tend to cover quite a lot in one period of forty minutes thus stressing more on the syllabus coverage rather than the students understanding.

Moreover as indicated by Sherub, teachers focused on lectures and gave bookish knowledge only:

Sherub: My science teacher limits his teaching to the textbooks and don't give us any outside knowledge. So we don't find science interesting.

According to most of these girls, teachers who used examples and language that was familiar were considered competent. For instance:

Sayden: Some one who is active and give lots of examples and connect their teaching to our daily lives.

Both groups remarked that they perceived different attitudes in Bhutanese science teachers and non-Bhutanese science teachers. For these girls, attitude is also an aspect of competence. Most of the girls expressed that the Bhutanese teachers were approachable and friendly. For example:

Chhimi: Most Bhutanese teachers are better than most non–Bhutanese teachers, as far as my experience stands. As far as possible, the Bhutanese teachers try to treat both boys and girls equally, and they don't show disparity between bright and dull students. In fact, they give more importance to the weaker students and try to pull them up. Bhutanese teachers have more understanding and understand the problems faced by the students.

Most of the girls are of the opinion that the interaction between the teachers and students is greater when the teacher is Bhutanese. The Bhutanese teacher can teach to our context and can explain difficult terminologies in Dzongkha. For instance:

Sangay: I like national teachers because we feel free with them and even if we can't understand some scientific terms, they explain in Dzongkha or by using simple language.

Chhoden: I like national teachers because they understand our problems, as they have experienced it before. They use simple English to teach and whenever we come across unfamiliar terms they teach us in Dzongkha.

Some of the girls expressed that the English accents of non-Bhutanese science teachers are different than Bhutanese English speakers, which makes them difficult to understand, thus impairing students learning. For example:

Chhencho: In the case of the outside teachers their English accents are different than Bhutanese English, so we don't understand their English.

Chhenzom demands that more Bhutanese science teachers should be recruited.

Chhenzom: The school should recruit more national science teachers, as they can teach to our context and understand our problems. They should check our home assignments regularly and give feedback. I feel comfortable with national science teachers. I feel free to interact with them and clarify doubts.

Teacher competence and nationality are strongly intertwined in these girls' views of teacher competency. They perceived national teachers to be competent as they can relate their teaching to students' everyday experiences, using examples and language that is familiar to students. A few girls from both groups reported opportunity to learn science from national science teachers. Those girls had a positive science experiences, whereas most of the girls who were taught by outside teachers and their experiences were mostly negative. Therefore, the girls believe that though outside teachers are academically sound, they are unable to understand Bhutanese culture or use examples from Bhutan, making science difficult for the girls, and the teachers seem incompetent.

Teachers: male or female

As stated by the girls, the other pertinent factor is the absence of female science teachers. Six of the twelve girls have had the opportunity of studying under female science teachers. Most of the girls are of the opinion that female teachers have better attitude than male teachers towards girls. They were found to be approachable and caring. For instance:

Chhoden: Female teachers are better as we feel free to ask questions and share our problems, as she can understand by being from the same sex. We feel shy to approach male teachers.

Samten feels that the female teachers are fair and frank and can create a conducive atmosphere for the girls' learning, and implement instructional strategies that actively involve girls in science, where there will be more sharing and discussion.

Samten: I like female as they are frank with students and they don't hesitate in sharing whatever they know.

Most of the girls are of the opinion that female teachers interact with girls more than men and create learning contexts that promote interaction more than men. Sangay appreciates the way female science teachers handle chapters like reproduction by arranging different learning styles. For instance:

Sangay: My first science teacher was an Indian lady and she was very interesting. She used to handle topics like reproduction gently by separating boys and girls so we don't feel shy to ask questions and take part in the discussion.

According to some of these girls, male teachers were uncaring and unfair. For example:
Chhenzom: We feel uneasy with the male teachers, moreover, they tend to be partial.

Sherub: We feel shy with male teachers to discuss.

Most of the girls are of the opinion that there are fewer female science teachers in Bhutan. Had there been more female science teachers in the past, the scenario of girls today in science–related fields would have been different. According to these girls, female science teachers play an important role in promoting girls' interest in science and scientific careers.

Chhewang: If there were more female science teachers in Bhutan before, many girls would have joined science-based field as female science teachers can encourage more girls to take up science.

Sayden: We feel that we would get more help from them, which would foster our interest and attitudes necessary for achieving in science.

Resources

All the girls are of the opinion that they should have access to all facilities in the school as most of the schools do not have enough resources. The kinds of resources girls talked about and which hindered their learning of science were: limited classroom space and furnishings, lack of laboratory materials and curriculum.

Limited classroom space and furnishing

The majority of the girls mentioned that in most school's students sit on the floor or they had to squeeze in to accommodate more students as the classrooms are poorly furnished. As Choeney explains with a sad tone:

Choeney: It was in grade six and there were thirty of us, we were doing an interesting experiment. The class didn't have desks and benches so we were made to sit on the floor. We didn't have a science laboratory so we conducted our experiment in the class.

Sangay concurs:

Sangay: The classroom appeared to be shabby. There was not enough furniture and few of the pieces were broken. We had to squeeze in to accommodate more friends. We even didn't have enough texts to go around. The blackboard in the classroom was very old and whenever our teacher attempted to write something it gave a squeaky sound and the word wouldn't become visible.

The participants from both groups were of the opinion that the limited classroom space and furnishings resulted in large class sizes. Owing to a large class size, the girls were deprived of attention from the teachers. This restricts teacher's movement in the classroom and the teachers failed to articulate well in their teaching. For example:

Chenzom: It hampers our learning of science when there are too many students in the class. The teachers are not able to articulate his/her teaching and give attention to every student. Most of the time students are left unattended and gradually shy away from science, which are mostly girls.

Most of the girls are of the opinion that failure on the part of teachers to check their home assignments and give proper feedback is due to over-sized classes. Lack of attention from teachers in the classroom leads girls to feel discouraged and to shy away from science, as expressed by Chhenzom.

Chhenzom: The classroom is overcrowded and at times it is difficult for the teacher to give attention to every student. Some of the students remain neglected because it is not possible for the teacher to check homework and provide proper feedback.

It is evident here that the inability on the part of a teacher to provide attention to the girls, because of large class size, has affected these girls' decisions to pursue science. Most of the girls are of the opinion that the overcrowded classrooms prevent teachers from managing the class and giving individual feedback, thus resulting in a poor classroom atmosphere. A large class size leads to poor classroom discipline as the disruptive behaviour of some students spoils the classroom atmosphere and the ultimate victims were the girls. Some of the girls said:

Sangay: It is difficult for the teachers to maintain class discipline. In a class where there are fewer students teachers can give equal attention to every student, and all can perform individual experiments. There will also be less problems in maintaining class discipline.

Today a lot of changes have been brought into schools. Schools are better supplied with necessary resources and competent teachers; however, these changes are not proportionate to the increase in the enrollment of students in schools. Therefore, the same problems seem to impact the learning of science by girls

Lack of laboratory materials

Some of the girls feel that the lack of resources, like laboratory materials, leads to teaching-learning constraints, handicapping both teachers and students. Hence, the teaching of science is limited to classrooms, as in the words of Choeney.

Choeney: Much of the teaching is confined within the four walls of the classroom and we are seldom taken to the laboratory. Chemistry is full of practicals but the sorry part is we are not able to perform all the activities because of the constraints of laboratory equipments.
The majority of the girls expressed that their dream of learning science through practical approaches is broken by the poorly equipped resources in the School. The girls' indifference towards science subjects is due to the lack of laboratory materials.

Chhewang: Since our science laboratory is not properly equipped we seldom perform experiments. Due to limited equipment the teacher demonstrates the experiment and we are deprived of performing individual/group experiments.

A majority of the girls expressed that a lack of laboratory resources leaves teachers with no choice but to carry out the practicals in the form of teacher demonstrations. For instance:

Samten: I like to learn science through hands on experience like conducting practicals and working in groups. Through practicals you get the clear picture of certain concepts and you become inquisitive to learn more. We are deprived of this opportunity, as most of our schools are not equipped adequately with resources. The practicals that we conduct are either in the form of teacher demonstration or group experiments.

Most of the girls are of the opinion that science can be better learned if taught through practical approaches and with a bit of extra effort from the teachers, as commented by Sayden.

Sayden: Most of the classroom teaching encompasses lecture methods. I feel that things could be better explained and understood if we conducted experiments. We could learn better science through practicals. A bit of organization and extra effort from the teachers' side would contribute to a better learning of science.

The girls seem to enjoy classes which are experiment-oriented, as expressed by Chhencho.

Chhencho: It was in grade six and we were forty in number. The experiment was arranged in the class as there was no science laboratory. Our teacher managed to borrow some laboratory equipments from the near by school. It was my first experiment and I found it very interesting.

Most of the girls feel that performing experiment and becoming familiar with the materials leads to a high level of retention. Such learning has more impact on the students. For instance:

Samten: We get more familiar with the information learned through practicals, rather than lecture or teacher demonstrations. We enjoy science when we are involved in it rather than teachers dominating it.

Curriculum

All the girls expressed that, in high school, the teachers continue to rely on Indian curriculum, especially high school science as Bhutan does not have a well-set curriculum. They did have positive attitudes about science in the lower grades, as the texts used were published in the Bhutanese context and the examples and illustrations were familiar to them. Some of the girls said:

Chhimi: In grade five and six, I followed a book written by a Bhutanese writer. The notes were simple and we could understand them. Most of the examples were based on Bhutanese life and it was easy to understand.

Some expressed that even the language used in Bhutanese textbooks are not at par with the student's level of understanding and easy to comprehend. For example

Sherub: The science texts used in grade four to six were published in Bhutan and written by Bhutanese authors. It was written to our context with simple English. It was relevant to our culture and easy to comprehend.

All the girls responded that the texts used in high schools are not suitable to the Bhutanese context. These texts are meant for Indian schools and they lack relevance. The illustrations and examples portrayed are strange to their culture, so girls feel alienated from learning science and gradually tend to shy away from it. For instance,

Sangay: The books that I have used so far are difficult to follow. It was written by Indian authors and we can't understand them because the examples given are all related to their countries, which are not familiar to us. The pictures shown in the books are unfamiliar to us and we don't know what they represent.

In addition, the girls attribute their dislike of science to the way girls are portrayed in the textbooks. The texts represent fewer girls and the girls are shown attending to less sophisticated jobs.

Sayden: So far I have seen more pictures of men than women in the textbooks that I have come across. For example, women are shown doing lowly jobs like weaving, looking after the children and attending household chores. Males are shown doing white-collar jobs and in highly paid jobs. We feel sad and feel that science is not meant for girls.

Most of the girls are of the opinion that the way girls are portrayed and represented in the textbook has a negative impact on girls, leaving them discouraged and feeling less important.

Assessment

The girls reported that assessments affected their liking of science due to the change in examination patterns as they progressed from elementary school to high school. Most of the girls mentioned positive experiences with examinations in the lower grades. For example:

Sonam: In the lower classes the types of examinations are objective and it was easy to score good marks. You don't have to worry about your language and sentences.

Most of the girls are of the opinion that, unlike in the lower grades, high school examinations demand subjective answers. Most of the girls stated that they made spelling mistakes, used wrong sentences, and sometime even left questions unanswered. Then girls feel out of place, as they are not used to the subjective pattern.

Singye: In higher classes it is more of a subjective type. In the subjective type there is a time constraints and we end up making spelling mistakes and having incomplete answers. As a result, we get fewer marks and ultimately we give up science.

Some girls mentioned that the critical factor which prevents them from doing well in science is the time constraint while writing subjective examinations. This leaves them with insufficient time to think and write complete answers. For instance,

Chhewang: I feel that the most important factor is the lack of time, as in lower classes the question pattern was an objective type demanding one or two word answer. In higher grades the question demands long answers, and we are unable to finish on time. As a result, some questions are left unattended and sometimes it is difficult to understand the questions.

One of the girls felt that she found it easy to answer "objective" questions as she could guess or even indulge in unfair means through gesture and signs, which was not possible with the subjective pattern.

Chhewang: In the lower classes the questions were mostly of an objective type, where there is little explanation so we could even indulge in unfair means. We

use different gestures and signs for different questions and answers. Form example the raise of a middle finger followed by scratching of nose means 3a. The figure'3' stands for question number 3 and a letter 'a' stands for answer choice 'a'.

Gender issues

The notion of gender is pervasive across all categories but much of it was felt when being with the opposite sex at school and at work. The feelings of unequal treatment in school and at home are quite new to Bhutan, theoretically. The school provides equal opportunities to both boys and girls in all respects. For example, both boys and girls are given free education and boarding facilities, are expected to take part in games and sports and other co-curricular activities, such as gardening or cultural presentations. The girls have an equal chance to gain admission to universities and careers, based on their academic proficiency.

Though gender differences do not appear on the surface, the girls are met with these differences (though unintended) at school and home. Gender differences are associated with experiences with boys, and gender about science and science related professions.

Experiences with boys

Both the groups seemed to have had negative experiences with boys. The rowdy and unfriendly nature of boys has hindered their learning of science, by creating an unfavourable atmosphere, which prevents them from taking science and taking it seriously. The girls indicated that their apathy to science is due to the unruly nature of boys. This disconcerted the girls and caused them to shy away from science. For example, these girls seem to dislike boys and this is revealed through their gestures and added emphasis on the word 'boys'. For instance,

Choeney: The boys were naughty. They tease the girls and sometimes I used to get irritated with them, so we try to stay away from them. Also, in the class, boys think that they are intelligent and try to show their superiority over the girls. They often make fun of us. Therefore, it makes the learning of science difficult for the girls.

Sonam: When the boys tease us, we are not able to concentrate on our studies. So we don't volunteer to answer questions, raised by the teacher, for fear of ridicule from the boys for answering wrong.

Some girls reported this was true of all subjects and that some girls dropped out of school to avoid this behaviour.

Samten: Girls are usually too shy to speak out and interact, whereas boys are bold and speak out whatever they know. Boys are interested and hard working. They make fun of girls and we tease them back, but they tease us in a bad

manner. We feel bad and can't pay attention in the class and don't feel like coming to school. Most of the boys talk about dirty things and show dirty gestures.

Sherub: Whenever teachers pose a question to girls they hesitate to answer, fearing ridicule from boys for giving the wrong answer.

Both boys and girls perceive science to be difficult, but the difference is shown in their test results. Boys perform better than girls. The girls' poor performance in science is attributed to their behaviour, their shyness and their reluctance to face boys and take up challenges.

Traditional gender beliefs about science and scientific professions

All the girls expressed more negative than positive beliefs between girls and science. The girls mentioned that their failure to do well in science is attributed to problems like pregnancy or wanting to raise a family early. For these girls, pregnancy is an event, which compels them to drop school. For example:

Choeney: Most of the girls drop from school either because of pregnancy or they want to get into some clerical jobs and raise a family or support their youngsters.

Chhencho: Most of the girls discontinue studies to enable them to marry early and raise a family. Most of the girls are of the opinion that if they don't marry early, later they won't get good husband.

Choeney, like other girls, was very shy to utter the word pregnancy and she did it with great difficulty. I could see it in her face that she had more to say. The consequences of getting married late were highlighted by Sangay.

Sangay: The girls don't want to suffer by working hard in science. They wanted to start early in life, raise a family and enjoy life. So they don't want to prolong their studies and quit school early.

Perhaps it is the concerns about marriage, as explained by some girls, that they were planning not to choose science, as they can enter the job market early without having to prolong their studies as in the science stream.

Most of the girls stated that getting pregnant while in school is not something new in Bhutan. However, the result is expulsion with no opportunity to return. For example:

Sonam: Some were forced to discontinue studies due to pregnancy. The schools considered such a case as a disgrace and the particular student will be sent out of the school. Even if they are made to continue they will be bullied by the boys in the school, as it brings a bad name to the school.

The girls are also of the opinion that the stereotypical attitude that science careers are masculine further hindered them from enrolling in science related professions.
For instance:

Chhoden: It is difficult for girls to take up careers in science, as we see that boys are performing most of the jobs related to science. The stereotypical view people have about girls is that scientific careers are challenging, so girls should opt for easy jobs. Moreover, we don't seee many women in the scientific field as the girls feel that scientific jobs are meant for boys only.

The majority of the girls perceive scientific professions as difficult to be pursued by them. The girls feel that they have to work harder than boys to succeed in science. The girls see themselves as less committed.

Samten: I believe that it is quite difficult for girls, as this profession demands patience and hard work. The girls are soft and impatient and easily get carried away by the feeling; such as I can't do this or that so they give up. Since in the past few girls took part in this field the present generation feel that science is not meant for girls. Scientific opportunities involve traveling to far off places, which is quite risky for the girls.

Concerning gender related differences in the learning of school science, all the girls said they prefer Biology to physics and chemistry. Some of the reasons provided were as follows:
Choeney: Biology is my best subject, as it is more of understanding than memorizing. I find math and physics difficult. These two subjects hampers my overall performance in the class. So I spend, most of my time doing math and physics. This demands more work and one really has to concentrate on the science subjects.

The presence of calculations and mathematic manipulation in physics and chemistry caused girls to reject science as Sayden responded.

Sayden: Since I am poor in math it affects my learning of chemistry and physics, as they are full of math. Science is full of math and calculations and the teachers are not very competent.

Chhewang shared the concept of biology being a subject mostly dealing with human anatomy, nature and life as perceived in their daily lives.

Chhewang: My favourite subject is biology, as we learn about our life and the surroundings. Biology can be understood on our own initiative even if there is no teacher, but it is difficult to follow other science subjects without the help of the teacher.

Most of the girls are of the opinion that the difference in exposure of girls to scientifically literate people in their daily lives provided a kind of support to the girls and have influenced their decisions in science subjects. For example:

Chhimi: I find math and biology easy, as I got a good foundation in biology when I was in grade seven and eight. Regarding math, my father was very good in math and he helped me a lot giving me extra coaching in this subject. I don't like chemistry and physics because of symbols, formulae and equations in it. I often get confused with the symbols and the equations.

Parental treatment and expectations

Most of the girls are of the opinion that girls' lack of aspiration in pursuing science courses stems from the family. Various related problems like parental treatment, expectations and family finance are described by every girl in relation to their experiences in science.

Parental treatment

The girls reported different kinds of treatment from their parents. Most parents gave unequal treatment to boys and girls. Some of the girls expressed that boys were sent to schools, whereas girls were kept at home to help their parents in the field.

> Sayden: Most of the parents preferred the education of boys over girls. Boys are enrolled in schools keeping girls at home to help them in the field.
>
> Chhimi: The parents consider girls as a weaker sex. They are not sent to far away schools, as they didn't want to part away from them. Gradually they end up staying home and attending to household chores.
>
> Some of the girls reported that the parents pay more attention to boys.
>
> Singye: My parents give more importance to my brother as they think that girls can depend on their spouses even if they don't get good jobs. But if the boys don't get good job in future they will suffer, as they have to support their families.
>
> Some of the girls expressed that the parents tend to divert their resources to boys. This, in a way, destroys girls' aspirations of pursuing further studies in science, as expressed by Chhoden.
>
> **Chhoden:** The parents feel that boys should work hard to have a good future whereas it is enough for the girls to study until a certain grade. In the case of boys, even if they fail in one grade they are made to repeat school.
>
> For some of the girls, parental encouragement is the main force behind wanting to pursue a science profession.
>
> Chhimi: I want to become a doctor, as my parents encourage me to become one, and also it is my desire to help the needy and the poor ones. My grandmother used to tell me that, during their time, there was no

basic health center or hospitals, and so my grandfather died of minor dysentery. This encouraged me to become a doctor and help the sick people. This drive in me helps to put more effort in the subject.

Chhencho reports that relatives and friends also have a hand in making girls aware of the importance of science and scientific careers.

Chhencho: Once my friend and I went out for lunch with her uncle in his car. In the process he asked us about our future plans. He advised us to work hard in science and try to pursue scientific jobs. He said you have lots of opportunities if you join this profession. At present our government is in need of national expertise in this field and there are lots of benefits and opportunities in this filed. So I got encouraged and I wanted to become a doctor.

Parental expectations

Most of the girls are of the opinion that since girls are taken care of, as they can inherit a major share of the property, it is not necessary for girls to work or study.
Sherub: The parents feel that girls are given the majority of the household shares, so it is not important for them to pursue scientific careers.

Some of the girls felt their future is determined by their husbands.

Singye: My parents feel that it is not necessary for girls to study beyond certain grade as the parents think that the girls can depend on their spouses even if they don't get god jobs.

Family financial position

The girls from both groups indicated that one of the reasons why girls are not continuing with science studies is attributed to financial constraints. According to these girls further schooling was possible only when the family has enough money.

Singye: The main reason for girls leaving school early is attributed to financial constraints. When the family is unable to support the education of their kids, girls were usually stopped from going to school. They are either kept at home or look for some jobs to support the family and the education of younger kids.

The girls from both groups lamented Bhutan's lack of higher learning institutes, forcing those who do not gain admission to seek further education outside the country at the expense of the parents.

Chhoden: Bhutan doesn't have centers to pursue further studies so they are sent to India. Therefore, not many can avail this opportunity. The rest need to be sent on their own expenses. So not many parents could afford to send their

kids to study in India especially girls as they are vulnerable. Moreover, parents do not want to part from their daughters. So the girls are left behind.
So, the perception is that only rich parents can afford to support girls' education. In the case of low-income groups, the education of girls is sacrificed for the sake of boys, as stated by Sayden.

Sayden: In most of the families, due to financial constraints, the parents are not able to support the education of their kids. In such a situation parents concentrate on the education of boys and ignore that of girls and arrange their marriages. But on the contrary for those parents who can afford and are educated pay equal attention to both boys and girls.

Social and cultural expectations

Most expectations affected girls' performance in science and career choices. Such influences affect girl's attitudes toward science and scientific careers. The girls identified social and cultural biases, which relegate girls to homemaking and attending to household chore, promote science for boys and not girls, and the lack of strong female role models. The stereotypical view held by society is that girls are homemakers. As a result, many girls end up staying at home and attending to household chores. For instance:

Chhoden: As per our custom, girls get the maximum share of the household. In the family if the number of members is less then the girls are refrained from going to school, as they need workforce in the field. The girls are made to stay back to take of the family's property.

Most of the girls are of the opinion that cultural and social practices such as, "science is for boys, not girls" and "girls need to work harder in science than boys," get in their way and obstruct their beliefs in science. As a result, many girls at school do not aspire to receive education beyond certain grades because of their traditional beliefs, stemming from socio-cultural expectations. For instance,

Sonam: The girls are affected because of the societal stereotype held by the public in general, and the parents in particular, that science professions are meant for boys and not girls. This prevents girls from aspiring for this profession, but this profession demands hard work and ability.

Lack of role models

Most of the girls feel that since, in the past, not many girls took up scientific jobs, they felt this was not their area. Even in the schools, there are not many female science teachers, nor are there many female doctors, engineers, or scientists around. So the girls assumed that either science-related jobs are not meant for them, or it is too difficult for females to pursue a career in this filed. The girls are of the opinion that the low number of females in the scientific field is attributed to the fact that, in the past, fewer girls pursued scientific careers. If they take up a science –related profession, then other girls might be encouraged to pursue science careers, as indicated by:

Sangay: At present our country lacks expertise in the scientific field, especially females. So I can encourage young girls to take interest in science and pursue scientific careers. This would in turn bring them lots of benefits, like comfortable life and help government to meet the shortage of human resources.

Chhewang: As a female science teacher I can encourage more girls to take up science by acting as a role model and creating an awareness as about the scope of scientific jobs in Bhutan. Teachers with a science background are sent abroad for training. As a Bhutanese we will understand the needs of students and can influence more students to become doctors, engineers, and science teachers.

Girls' expectations for their future

All girls from the science group had future plans. They were well aware of the importance of science and had pre-set goals. Some of these girls were influenced by their parents, for example:

Choden: My parents encouraged me to become a doctor, as in my family there is no one in the medical line and sometimes things are very difficult, especially when some one in the family gets sick as in Bhutan the medical amenities are not fully set.

A few of them were also influenced by the teachers as the government lacks human resources in the field of science:

Choeney: Some teachers also encourage girls to go in the medical line, as the country is facing acute shortage of doctors in the country.

Chhodens' decision to pursue medicine stems from the experience she had with her ailing aunt who was referred to India for treatment, incurring heavy expenditure on the family.

Chhoden: When I was young my aunt happened to suffer from a serious illness and she had to be transferred to a medical centre in India. Taking her to India incurred lots of expenditure. If we have medical experts I our country we can minimize the cost of treatment and the money can be used for other purposes. So I decided to pursue medicine.

Here, it is noticeable that most of the girls were encouraged by parents, teachers, or an ailing family member to study science. I was touched by Chhoden's comments that her aunt's long illness inspired her to go to medicine.

Some of the girls were lured by the power and fame they associate with people in the science field. The girls are aware of the fact that if they pursue a scientific career, they would enjoy advantages, such as going abroad for further studies. For example:

Chhenzom: My aim is to become an engineer as they are paid a high salary and can avail other benefits. I can construct my own house without having to

depend on others. I will also get an opportunity to go abroad for training and, once back in the country, I can introduce different architectural designs in the country. I can be a role model for these young girls in Bhutan and can meet the needs of the expertise in the country.

It was evident that all the girls from the science group had planned goals for their future. These girls put effort into their science studies and earned good grades. The girls from the non-science group, however, were ignorant about the scope of science and science-related professions until our conversations about the prospects of a science-based career.
Surprisingly, at the end, all the girls were enthusiastic about science; those who had not chosen science initially said they had never discussed about the prospects and importance of science and science-related professions, These girls seemed highly motivated as a result of interacting with the researcher. For instance:

Sangay: Sir, before I didn't know about the importance of science and scientific career. Now my interaction with sir, has opened my eyes about the prospect of science and scientific career. Now no matter what comes in my way, I am going to work hard in science and pursue scientific career.

Samten: We were not aware of the importance about science and scientific professions before. Being with sir in this study has opened our eyes and now we know that science is important. So from now onwards we would like to take interest in science.

Summary

It was quite an enriching experience for me to learn that the girls from the science group had pre-set goals, as to what they would like to pursue in future, whereas the girls from the non-science group were ignorant of what their future would look like. The girls' interest in science is defined by school, teachers, resources, parents, as well as cultural and social expectations. The negative school experiences with science further added to their negative gender beliefs that girls go for lower-paying jobs. The notion that girls are to be homemakers while it is the responsibility of boys to work and support the family is ingrained. Shortage of laboratory equipment, teachers, and unfamiliar curriculum made their learning of science ineffective.

Some of these girls have the potential to do well in science, but the influence of others in their lives had the strongest effect on their decisions about whether to pursue science or not. At home, most of the parents were not able to give much guidance or create awareness in girls about the importance of science and science-related careers. Moreover, most of the parents favored the education of boys over girls. Boys were sent to schools outside for further studies, while girls remained home, attending to household chores and other family matters.

Gradually, girls end up taking less-valued jobs. The girls were also of the belief that they will be taken care of by their spouses and will be given the major

share of the household property. It seems that some of these girls do not feel challendeged and it is less likely that they will work hard or pursue challenging professions.

Implications

This study gave me new insights to become an able teacher and guardian. As teachers, we fail to understand students' aspiration and potentials. We seem to care less about their interest or providing guidance and encouragement about science and scientific career. It is evident from the study that girls have pre-set goals as to what career guidance need to be initiated very early in their lives. If parents and teachers want to influence their students, they have to provide guidance and career counseling as soon as the students join middle school. Moreover, the fact those girls' indifference to science and science careers seem to also stem from their homes, as the parents fail to encourage them or create awareness in girls about the prospects of science and science-related jobs. Therefore, there is a need for the parents to learn about their daughters' interests in science and provide support and encouragement.

Recommendations

My study represents high school girls' perceptions of science and its impact on career choice. This study provides significant insight into understanding girls' perspectives on science and science-based careers. It is evident from this study that there is a lot of work to be done by administrators, CAPSD, schools, teachers, and parents, in order to effectively confront the problems faced by girls and to draw more girls toward science.

Since the inception of Youth Guidance and Counseling Division (YGCD) in 1996, numerous youth programmes have been carried out in career education in order to help students set appropriate life goals and develop an attitude of self-reliance and responsibility. The present study suggests that girls' failure to do well in science is the culmination of the kind of treatment they receive at home, school, from boys, and the school characteristics (teacher instruction, resources, curriculum, and assessment).

Recommendations for administrators

Administrators must ensure that the school has competent teachers, who are impartial and sincere in their duties. Administrators must also screen and recruit science teachers who are committed role models and are willing to establish science programmes which can encourage both young men and women. Experiences and findings from this study indicate the need for beginners to have competent science teachers as soon as they start learning science. Good science teachers create a good impression of science and encourage these beginners to pursue science–related careers. Administrators need to recognize that it is their responsibility to ensure that the classroom atmosphere is gender- sensitive, conducive for learning, and that the teacher is fair to everyone in the class. The teachers should also be responsible for students' achievement in science.

Administrators must see that the schools are well equipped in terms of laboratory and library facilities. Administrators should provide development for teachers and give administrative support, so that they maintain high academic standards for students. Administrators should ensure that the teachers are committee and have a strong sense of obligation to their profession.

Staff development should be provided in an attempt to develop an understanding of the problems faced by students in general and by girls' in particular, and identify students with potential who wish to discontinue science in order to develop strategies to meet the needs of these students. Administrators should provide guidance and counseling to students as early as middle school. Students must be made aware of the importance of science and science related careers. The cause of problems, which affect girls' achievement in sciece, must be identified and corrected.

School administrators must conduct workshops to invite teachers to participate in the discussion on girls' failure to do well in science and involve teachers in the planning and implementation of programmes. They should initiate parent-teacher conferences on a regular basis. Such meetings would not only enhance parent-teacher relationships, but also provide parents with information on parenting skills, so that they can assist their children at home with assignments, provide gender-sensitive environment, and encourage their children to pursue science studies and science careers irrespective of gender and other differences.

Peeks (1993) posits the theory that students learn at their optimum potential when there is a cooperative interaction between home and school. Administrators should ensure that the school has enough resources, so that the teachers are provided with small and manageable classes. It is difficult for the teachers to manage big classes, leading to disciplinary issues and a lack of individual attention.

There is a need to recruit more Bhutanese teachers as they can teach to disseminate information whenever necessary. To meet the needs of human resources shortages, administrators should see that there are higher learning institutes in the country, so that the economically disadvantaged may also have an opportunity to pursue higher education.

Recommendations for Curriculum and Professional Support Division (CAPSD)

A wide range of studies suggest that if we are to encourage girls to do well in science, then the teaching of science ought to be changed in certain specific ways (Whyte, 1984). For instance, the social and human applications of science should feature as part of the science curriculum, and textbooks should be revised to incorporate girls' interests and concerns, as well as those of boys. Experience and findings from this study indicate that the science texts that they follow in high school are alien to Bhutanese culture. The terminologies, illustrations and examples portrayed in the texts are often tenacious in nature.

Moreover, the books represent fewer girls that are shown doing less-valued jobs. This has a negative impact on girls, so they tend to shy away from science. The girls preferred to follow texts designed in Bhutanese context as in lower grades. Possibly, I should not overlook a suggestion proposed in the study that the sciences should be merged into one general subject in secondary schools. Such a step could minimize girls ignoring science due to their dislike of one of the science subjects. Since the method has been working well in the Bhutanese middle schools, it can also be made to work even more effectively in secondary schools. The production of non-biased materials, incorporating interest and approaches, which will appeal to girls, may help towards encouraging them to go into science and technology, though it will not be sufficient as a step on its own.

There is a need for educators to reconsider the over-reliance on standard examinations deciding one's future. The same concern is being raised in Tanzania's education system as stated by Nenze (1994), "While the examination is meant to be standardized, it remains to question whether our school are truly standardized, in terms for students, their social and academic backgrounds, their exposure to science activities, science talks, science literature as well as learning materials and access to science teachers" (p.81). Educators should give serious thought to this issue.

I wish to acknowledge another point made by the girls in this study that in lower grades the examination patterns are more objective. They find it difficult to cope with the subjective pattern as they move into high school. There is a need to have uniform examination patterns across all grades or to keep provision to have both objective and subjective patterns for all grades.

Recommendations for schools

Parents and students consider school as their second home, and teachers as their guardians. Students spend half of their youthful life in schools, entering as tiny toddlers and leaving as young men and women. The school has an important role in shaping their social skills, confidence, attitudes and occupational skills, so that they are ready to face any challenges in the contemporary world. The school should create a conducive atmosphere where the students can interact freely and feel at home. The school should recruit qualified teacher, who are diligent, sincere, and committed to their profession. The school should ensure that the teachers are fair to every one in the class irrespective of gender, abilities and background.

The teachers must not resort to favouritism, whether in class activities or assessments. The schools should expand their infrastructures to accommodate all those students who wish to study. Therefore, it is essential for the school to develop a positive school climate for all students and staff by generating an attitude of caring and sharing.

The school should give attention to programmes like teacher academic development, where pre-service and in-service education should be initiated. In

a forum like this, teachers must be made aware of the need to develop sensitivity in areas like gender, child background and abilities, and also staff development activities must continue to deepen such sensitivity in light of the daily experience of practising teachers. The school must have sessions on career counseling, so that students are aware of career opportunities.

Counseling and tutoring programmes should be made available to the weaker students as early as middle school. Such programmes should promote awareness and importance of different subjects and career perspectives. These programmes would also help inculcate a sense of self-confidence and self-worth, especially in girls who are shy and have low self-esteem. In United Kingdom, people were able to publicize the problem of equal opportunities through the use of media, television, newspapers and journals. This has created awareness among parents, the general public, and teachers, about the need for action to remedy girls' underachievement in science (Kelley, 1985).

The school should ensure that the students have access to laboratory and library facilities, so that teaching and learning is not confined to the four walls of the classroom or the textbooks, but that they should also open up various avenues like math clubs, science clubs, and scouts. These clubs should organize activities like quizzes, symposia, debates, and speeches regarding the positive impact of science and scientific career perspectives. This would help students to think about science outside the classroom and familiarize themselves with different scientific activities which would foster interest in science related careers. The school should invite guest speakers like doctors, and engineers, both male and female, to share their fields and job perspectives. The school should also set up a science corner where information about the importance of science and career opportunities could be displayed.

The school should also have a clear set of rules for the students and ensure that students adhere to these rules. Anyone failing to comply with these rules must be identified and given necessary help to correct their behaviour and make value judgments about its appropriateness instead of penalizing the child. Benshoff, Poidevant and Cashwell (1994) state that "a systematic approval to discipline, then, can be viewed as one dimension of a total learning environment designed to impact on both cognitive and affective aspects of child development" (p.164).

The school can expect to achieve a set of goals only if the students adhere to it. So the schools must encourage students to learn that the rules are important and if they break the rules they will have to face the consequences. Teachers, too, should be instructed to follow the rules strictly and be consistent in applying them.

Recommendations for teachers

Teachers are highly regarded worldwide, so they must work hard to safeguard their name and much-acclaimed fame. Teachers need to understand the psychology of students and their background. They must be committed to their profession and treat students equally irrespective of gender, abilities and

background. The teachers should be unbiased and should not practise favouritism. A student's slight hatred of teachers can shift toward the subjects being handled by them and can have dire consequences. Teachers should act as a role model and make students aware of the importance of science and technology. Teachers should create gender-sensitive classrooms and give equal opportunity to all the students in the class.

Teachers are more likely to be conservative about sex roles than others. The boys are still likely to take the lead in class activities, so the teachers need to put forth special efforts to ensure girls' full participation. The girls' inattention is less to be noticed by teachers, and boys tend to monopolize resources and teachers' attention. The teachers should counter the prevailing masculine image of science subjects and patterns of male dominance in laboratories and classrooms through workshops, which highlight experiences of others and encourage feedback from observers. The national departments of education in Portugal and Ireland have held seminars and workshops for teachers and head teachers to enlighten them on issues of girls' achievement in science.

To encourage more girls to take science, a work on equal opportunities in teacher education, both initial and in-service, was initiated. In the Netherlands and London, courses have been run to prepare women for management positions in schools. Efforts are being made to train more women science teachers in Ireland (Whyte, 1984).

Teachers should not underestimate students, rather they should have high expectations of them, pose questions, challenge their ability, and provide opportunities for them to show initiative and take responsibility. Students must be exposed to practical works in the laboratory and develop laboratory skills. Teachers should involve students in outdoor science activities like field trips, visits to science museums, and allow choices and autonomous decision-making to empower them about the perspectives of science.

Recommendations for Parents

Parents have a big role to play in their children's lives. Parents are the first people with whom children come into contact. They have a great potential for affecting both positively and negatively, not only a student's behavior, but also such critical areas as attitudes, self-concept, and self-esteem. Parents who lack formal education are less interested in monitoring children both in school and in extra-curricular activities, so they seem to have less interaction with their children and are depriving them of educational study aids and games. On the contrary, parents who are educated were able to monitor their children and tend to have higher expectations of them.

Parents should not rely solely on schools and teachers. They should also play a supportive role to schools as that their children get the best possible education. Parents should meet teachers often and keep track of the performance of their children. They should also be able to discuss their children's weaknesses and strengths, so that the teachers can better help students improve. Parents should also guide their children in home assignments and other school-related

activities. They should create awareness among children about the importance of science and technology, with regard to scientific professions, which will be further reinforced by teachers in the school.

Parents should give equal treatment to both boys and girls, irrespective of their abilities and differences. Parents should be made aware of the importance of girls' education in science through parent-teacher meetings or through the media. Parents knowingly or unknowingly treat girls with less respect and give less freedom as compared to boys. Girls' education is thus compromised for the sake of boys. Reports found that parents steered girls toward traditional female occupations and that girls received little or no encouragement in their initial interest in science from their parents (AAUW, 1992).

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FOSTERING VALUES AND TRADITIONS IN SCHOOLS

- Dr. Jagar Dorji

Introduction

This paper was first presented at the Third UNESCO-ACEID International Conference on "Educational Innovation for Sustainable Development" in Bangkok, Thailand, in December 1997. Values and traditions are an important part of culture and are frequently called upon to heal the ills of the society. School curriculum, therefore, must address the pervasive influence of the values and traditions from our culture.

The rapid expansion of modern education facilities in the past over 40 years explains the consistent commitment of the Royal Government to providing free education to all children in Bhutan. Unlike the early 1960s when the government had to go after the parents to send their children to schools, Education Department is now under great pressure to accommodate all children of school-going age in the limited number of schools. People obviously rate the value of schooling very high.

It had been once pointed out that the basic problem in the developing countries seems to be the struggle with the number games (Beeby, 1966). The explosion of children's population further intensifies this game. Often it seems that the problem is there for good.

Education is recognised as a long-term investment in human resource development. The high priority given to education since 1961 especially in terms of budget allocation is of this belief. On the other hand, it has been said that the students coming out of the school system should be appropriately prepared with adequate skills and understanding of the relationship between right and wrong, and committed to act accordingly. Unless this happens, the resources spent on education cannot be accounted as long term investment (Education Department, 1997).

Traditionally, school curriculum has been generally knowledge-based, preparing students mainly for deskwork rather than farm-based, technical and manual. To address this concern, the Royal Government has recently refocused its policy on what is called "wholesome education".

It has been envisaged that during the 9th Five Year Plan (2002-2007) and beyond, the Education Department will fully dedicate itself to promoting quality education together with physical expansion. In this paper, 'quality' refers mainly to values.

This paper presents an overview of the purpose of education in Bhutan in relation to values. Then it attempts to discuss materialism vis-à-vis moral and ethical values. Some traditional practices are also mentioned as a way of reminding ourselves of our cultural heritage. An attempt is also made to describe how schools should help foster the basic universal human values as a part of the process of education. Finally, some reflection is done on the traditional education system as something to emulate. The

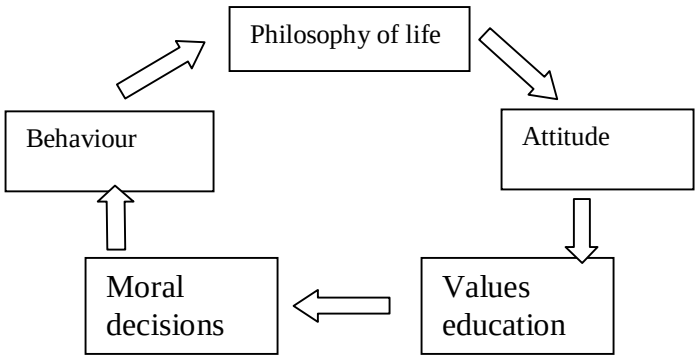
paper also shows that the traditional beliefs and practices have more to offer to the modern age than we can imagine.

What is value?

I must mention here that to define values is like indulging in a gamble where the outcome is not predictable. Each individual may describe a particular value differently, which makes it a complex phenomenon. At a simple level, values may be described as those virtues in which you strongly believe and are a part of your personal character. At another level, value is defined as "an enduring belief that a specific mode of conduct or end-state of existence is personally or socially preferable to an opposite or converse mode of conduct or end-state of existence (Rokeah, 1973).

There are three aspects of values – intrinsic, instrumental and technical. Intrinsic values are those virtues pursued for their own sake as an end itself. For instance, we go to a temple to offer butter lamps and incense and derive a certain satisfaction from the good deed. Instrumental values are those aspects of virtues that lead us to achieve some purposes. They are used as means or instruments to achieve our goals. For example, being good to each other is a means to help us maintain our goal of peaceful and happy co-existence in the society. When a person stresses excellence in the given task, it is called technical value. A teacher stressing on the best method in his/her teaching is using the technical aspect of values (Dhokalia (2001:19).

Value is not something we live with today and change it the next day. It is a part of our character as the diagram below shows.



The diagram above shows starts from the *philosophy* of life where an individual may have a belief that one has to earn money as a means of living. This will be clearly depicted in his/her *attitude* towards how one makes such an earning – may be at the cost of another person by being smart. As a result of *value education* in schools or in workplace, the person's attitude may change. The moral *decisions* taken by the person in consequence will be evident in the *behaviour* of the person. There could be a change in the attitude, which in turn will help change the belief that existed in the person. This is a cyclical effect, which could happen as a result of value education in schools. The process will continue.

How effectively we can foster values in our learners will largely depend on the intentions expressed in the curriculum. For this reason, it is appropriate to visit the relevant document developed for the purpose.

The Purpose of Education

In order to attain the goal of wholesome education, the Department of Education has been considering school education in the following directions:

1. Education is not just a place for providing knowledge and the art of reading and writing, but it is also a fertile ground for citizenship education. To this end, education:

   a. must empower the students with moral and ethical reasoning, so that values worthy of human civilisation can be sustained for the benefit of all posterity;

   b. should create in children the awareness about and respond to the cyclical relationship between the good deeds and their positive consequences and bad deeds and their negative consequences; and

   c. should also develop in children the value of love and compassion, tolerance and empathy (CAPSS Newsletter, No.10, 1997).

In 1996, the Education Department had published a curriculum handbook as guideline for teachers, which has the following aims:

1. Bhutanese society is based on benevolent discipline of mutual trust and obligations. In this regard, the love and respect for the King, the country, teachers, parents and the Bhutanese people in general are to be emphasised.

2. To help students recognise their own worth as individuals and as members of the Bhutanese society, school education is expected to promote in students:

   a) Individual growth in relation to social needs,
   b) A sense of resourcefulness and self-reliance,
   c) Self-discipline, accountability and respect for duty,
   d) Honesty, co-operation and respect for other people,
   e) An attitude of pursuing excellence,
   f) An attitude of service and care for those less fortunate than themselves,
   g) Appreciation of the values of other cultures and traditions and commit themselves to preserving and benefiting from such acts,
   h) Appreciation and respect for the rules of social institutions,
   i) A sense of respect and appreciation for the Buddhist philosophy of love and compassion and apply them in their day-to-day lives.
   (Education Department, 1996).

These aims show a clear direction for schools. But we also have a greater challenge in a world that is increasingly affected by the reality of living. The aims given above at least sensitise what has been said about teaching that, "... in the pressure of our day to day teaching, we often allow a giant gap to develop - a gap between what we say and what we do" (Krischenbaum and Simon, 1969). This gap is nothing more than the absence of values.

The aims outlined above have relevance in the international context, too. Education should aim at developing positive attitudes, an in-depth understanding of the life and culture of other nations that will lead to peaceful co-existence. These form a part of the wholesome education that we ought to stress in our education system. It is our moral responsibility to create an awareness of the differences between materialism and moral and ethical values. Being ignorant about these is allowing fashion and materialism to shroud our consciousness.

Unfortunately, in the modern age of over-consciousness, we are often checked from doing this for fear of being accused of indoctrination. By the time we regain our consciousness, a generation or two would have been too late to redeem anything that is called our values and traditions. This may turn out to be too costly to the nation and the society in future. I am always grateful to our beloved King who often reminds us that the existence of a nation depends upon how patriotic our citizens are, which too can only be fostered through education.

Materialism versus Moral and Ethical values

Three basic poisons that are essentially characteristic of materialism affect living a worldly life. They are:

a) The poison of desire,
b) The poison of hatred, and
c) The poison of ignorance.

Desire is not just a "want" to fulfil what Maslow called the basic needs. Human nature is such that once the basic needs are satisfied; there is a desire to look beyond the basic needs. It has a craving for wealth, comfort and other sources of fun, pleasure, and amusement that are not easily affordable. Then there is a desire for power - the power of money. But when these needs are not achieved or not afforded or are challenged, we suffer from frustration, which in turn leads to anger, hatred and suffering. Our wish to fulfil the desire overtakes our reasoning power.

As can be seen, hatred emanates from desire. As our desires are not always fulfilled, we feel angry and hate those who do not help us fulfil the desires. For instance, a person involved in a business contract will try to maximise his/her gain from this transaction. Often people submit to the desire of maximising profits and forget the initial intention to provide the best possible services or a quality outcome. Even unfair means are attempted and anyone who is not co-operative in this venture immediately becomes the object of hatred.

Ignorance is not bliss anymore. People hate each other because of ignorance. For example, we develop prejudice against a particular society because we do not have in-depth knowledge about how their social system actually functions. Ignorance does not only mean being unaware of the problems, it also means not understanding and caring about them. Our inner eyes are shrouded with a thick cloud of mundane desires, pride and ego leading to confusion in our priority.

In spite of the advanced communication system, we still remain ignorant about the people and cultures of different countries and about the problems within our own

countries. There is little value for empathy, love and respect, because we choose not to improve on our prejudices. We find much satisfaction in ignorance and hatred. Empathy is unexciting, not adventurous and not attractive. Arms sales are more profitable than food production. Disrupting peaceful life in the country of one's birth seems more adventurous and fulfilling. Without our knowing we may be submitting to the selfish desires of some people, who take advantage of the ignorance that prevail in us and thus fall victim to their intents.

There is yet another problem with the materialistic humans - the ego. An eminent translator of Buddhism in the west defines ego as:

> Incessant movements of grasping at a delusory notion of "I" and "mine", self and other, and all the concepts, ideas, desires, and activity that will sustain that false construction (Sogyal Rinpoche, 1992:116-7).

Ego is a shield against criticism and attacks on personal and material benefits that are earned through unfair means. The question is how do we address these concerns in our school education?

The heritage

Every society has a rich store of beliefs and practices inherited from their ancestors. Over the years, the experiences, research, debates and rejections and adoptions had resulted in written and oral forms of culture to be transmitted to posterity. The virtues described below represent by and large the traditions observed among Bhutanese families. In principle, we have inherited a range of customs and values worthy of practice. Some practices that deserve to be mentioned are given here.

There are rituals within individual families that embrace a bond of affection between the parents, children, grandparents and relatives. For example, old parents are never left uncared for by the earning children while the former also do not consider it a burden of dependence. When we were infants, we were allowed to sleep with our parents so that we could feel the warmth and love and thus enjoy an assured security.

Parents also withstand innumerable hardships to ensure a secure and comfortable future for their children. When they become worn out with the weight of time and labour, it is only natural that the kindness and care and love shown previously are reciprocated in equal, if not greater, measure of love and care. According to a popular proverb drawn from the text of Nagarjuna, a famous second century Buddhist scholar in India, even if you carry your mother and make a trip around the world, not all that you owe to her can be returned.

Such a bond of love is also strengthened by the general belief that only a karmic destiny in the previous life brings the individuals together as parents and children and brothers and sisters, even as citizens of the same country and within the benevolent fold of the same ruler. That is why love and gratitude are to be returned. It is a cyclical process whereby all sentient beings were our parents in our previous births and as such deserve to be treated with kindness at all times (Patrul Rinpoche, 1994).

Each family in the village must maintain the best room for praying with an altar where offerings are made daily and rituals are performed annually or sometimes monthly. This ancestral tradition brings together all the members of the family from wherever they are working or living. The bonds are thus strengthened and sustained even though members of the family live in different places. This is still a very popular tradition in Bhutan.

At the village level, the Bhutanese families share their food and other resources. For example, when there is a death in a family, the entire village will bring stock of food and come to help in the work. This age-old tradition still continues to hold strong in the villages. If a family in the village has not been able to complete a particular work within the stipulated time, other families provide their labours - free. I once went to console a family in a different social set-up. Many people came to do the same, but they came empty-handed and made no offer to help the poor family. Apart from the signs of sorrows in their eyes, they did nothing. I immediately became so proud that we have a different system.

In the past, most Bhutanese lived on subsistence farming, and had enough to eat and clothe every member. Where there were shortages, others could loan out what they had. The question of envy and discontentment were rare. Plenty and poverty were destiny and so accepted as a way of life, but those with resources could improve their karma by giving something to those without. This is how they lived happily together. Today, materialism is gradually devouring the benevolent minds of the individuals.

Implications for School Education

Aristotle had once said that the future of the empire depends upon the education of children. We have heard our beloved King in modern times saying almost the same thing. On 17 December 2002, His Majesty had told the gathering in Samtse “the future of our nation depends on the educated people of today”. Textbooks of languages (Dzongkha and English), Social Studies and Life Sciences in our schools are laden with values (Education Department, 1995). School is one of the avenues where values are debated extensively.

We believe that the development of values depends upon what and how children experience in schools both through the formal courses of studies and the informal social life. There is now a repertoire of values clarifying methods in the teaching of most formal subjects in schools. For Harmin, Krischenbaum and Simon (1970), "nothing is quite as gratifying for teachers and students as dealing with real and relevant questions and being deeply involved in the value quest."

The organisational life in the school is an effective method of developing positive values and attitudes among the students. The way teachers talk to the students, the way children are recognised for what they can do and the relationships that students observe among the adults (mainly teachers) will have tremendous impact on their growth and maturity. Under the leadership of the teachers, schools at every level can seek to develop clear understanding of what values mean. They are then expected to take every opportunity to clarify and provide experiences for children to understand what values the school stands for and what values would best make them worthy citizens (Education Department, 1996).

Schools, through their rules, should also prepare students to counter the three poisons described above (as well as the ego) by practising the ten virtues of Buddhism. The ten virtues of living are given below in three categories:

A. Virtues involving physical act:

1. Not destroying life (Sok Machoedpa)
2. Not taking what has not been given (Majinpa Lenpa Pongwa).
3. Refraining from improper sexual practices (Doedchhag Pongwa).

B. Virtues involving speech:

4. Not telling the falsehood (Zuen `Mrawa Pongwa).
5. Not using abusive language (Tshigtsup `Mrawa Pongwa).
6. Not slandering others (Zhenla Tam Magyenpa `Mrawa Pongwa).
7. Not indulging in irrelevant talks (Doenmed Kha Mangwa Pongwa).

C. Virtues involving mind:

8. Not being covetous (Norla Michhagpa)
9. Not being malicious (Ngagyal Dang Thradog Makedpa)
10. Not holding destructive beliefs (Zhenla `Noedsem Makedpa).

The school curricula, particularly the Social Studies, require teachers to invite local village elders to give talks to the children. The Social Studies also require children to interview and gather data from the country people and investigate for themselves the traditions and history of their ancestors and local folklores. Local traditions and environment become the sources of learning for children in lower classes.

An important reason for emphasising the traditional values is better explained in the following words in a guideline given to the teachers:

> You must be aware of the various entities that have tried to sow dissension in our peaceful kingdom and destroy the very tenets that our sovereignty is founded upon. Sandwiched between the two most populous countries in the world, outnumbered in any conceivable assembly, our existence as a separate entity, be it as a Bhutanese people, a nation or as a culture, is already on a fragile setting ... Let us not be idle spectators as divisive forces try to undermine and destroy what we all have been trying to achieve for so long for our people (Education Department, 1997).

Landlocked countries like Bhutan can only depend on the unique culture and traditions to protect our sovereign independence. They are our mark of identification amongst the exotic wealth of cultural varieties in the world. They are our protective shields. They tell people of the world of the status that Bhutan and its people enjoy as a nation.

The main challenge that lies ahead of us is the qualitative improvement in our education, to be closer to achieving the vision that our King has for Bhutan; where people are peace-loving, prosperous, productive and content, letting the national colour of Bhutan flying high amidst those of other nations. Each and every Bhutanese will proudly

continue to treasure and practise the traditional customs and values. At the same time, they can also adjust confidently to the cosmopolitan atmosphere of the changing world (Education Department, 1997).

What education in Bhutan is aiming at is much in line with the traditions that prevail in most other countries. Our education system may be inclined more towards a Buddhist way of thinking. But that is our main cultural root. Many eminent educationists in their discourses on what schools could provide by way of experiences pointed out that curriculum should be within the framework of culture and traditions (Skilbeck, 1984, Lawton, 1982, Golby, 1983 and others).

How to teach values in schools?

Below, I suggest some approaches to teaching values. These are adapted from the literature that I have been able to access from other countries.

1. Reflections on a story: I have known people who tell stories to children in schools. But I also observed that storytellers give their own conclusions. Stories should have an open end, which means that the storyteller should attach no moral theme. It is the questions that follow that make the story telling more exciting and interesting. Teachers can ask fact-recalling questions gradually leading to probing questions, personal opinions on some characters in the story and their own conclusion. Children should be allowed to participate in and construct their own moral themes from the story.

2. Another idea of teaching values consists of three levels – fact level, concept level, and value level.

   2.1. Fact level: This is the stimulator. The teacher provides a piece of abstract from newspaper, an incident, or even a created story for students to listen to or read.
   2.2. Concept level: At the concept level, the teacher tries to make the pupils understand the facts thoroughly by asking questions like – what does it say? What is the main problem? Why has this happened? And so on.
   2.3. Value level: Now the teacher can ask questions like – what would you do if you were this person? What is your opinion of this and that?

   At the value level, the teacher tries to bring out from children their own conclusions about the issue at hand. It may be necessary to help the children come to the point if they get distracted. The last question will be "how will you practise this virtue from now onwards?" This should make them come up with some strategies to practise the virtues.

3. Clarification: This approach is also similar to the second one above. There are four steps – receiving, responding, valuing and organising.

   In the first step, some information is given to the children that serve as stimulus.
   In the second step, children receive information. This is indicated by children showing interest, enjoying the information and so on. If no

reaction is seen on their faces, it is clear the information is not received. In the third step, alternative values are given and children make choices. If they choose the value that is intended, then it is clear they prefer the value being discussed. At least they understand this value better than the other one.

In the fourth step, children start to say they would do this and that to practise the value/virtue. This is an indication that they are organising the process of internalising the value.

4. Sometimes, one can pick up a topic that is quite common in life. One can start discussing about, say, *honesty* right from the beginning. You may give some information to stimulate discussion. You will need to ask a series of questions.

    i) Tell me what is honesty?
    ii) Tell me the name of a person who is honest. Why do you say he is honest?
    iii) Have you seen anyone who is not honest? Why do you think he/she is not honest?
    iii) Can you tell me about a day when you were honest? How did you feel?
    iv) What do your parents say about honesty?
    v) What do your teachers say about honesty?
    vi) What do your friends say about honesty?
    vii) Do you like being honest? Why?
    viii) How would you continue to be honest from now on?

It is popular among learned Buddhists to assimilate a certain value in three ways - the view, contemplation upon the view and finally practice after careful contemplation. A person may have a view on, say, compassion through available information. He/she contemplates on the idea of compassion and looks at it from all possible angles and even in relation to practising the idea. At this point, one may also discuss and ask a number of questions to really understand the idea. If, after careful contemplation, he/she is convinced that compassion is a good characteristic of a person, then he/she may start practising it. The Buddha had even said that one should not practise anything without proper understanding. Informed decisions are considered always valid and rewarding (The Dalai Lama, 2001).

Of late I have learnt about meditation. The essence of meditation, as I understand it, is to know your mind. Once you know your mind, it can guide the thoughts, attitudes and actions. I tend to think that all students in our schools must sit in quiet meditation to meditate for fifteen minutes daily. But without a proper guide from a learned teacher, meditation is not recommended just for the sake of it.

These are some suggestions that teachers may start using in their classes. As for stories and incidents, there are plenty of them around, everywhere. You have to take a topic from the syllabus for a particular class and use one of the above approaches.

Conclusion

It is easy to propose innovative ideas for school education. It is also easy to imagine what schools should ideally provide the children as worthwhile experiences. It is far

more difficult to select and organise contents into learning activities. Still more difficult it is to realise the objectives.

What this paper has described is a combination of what school education should provide and those that are already in practice. In our struggle to reach education services to the children in all corners of the country, quality has been brushed aside, more by accident than by intent. We have seen that examinations and certificates are the main tickets to success. Fortunately, we set a trend to change the direction to providing an education enriched with values.

In the ancient times, education gave importance to spiritual meaning as much as it did to knowledge. There was food for intellectual and affective development, and there were opportunities for skills-development. For this reason, there were people who mastered thirteen different arts and crafts, beside their ability to cipher the scripts in depth. The Buddha and the subsequent Buddhist preceptors taught moral and ethical values as much as the contents of science and art. When modernisation and development came, materialism occupied the front line. It is time to look back and learn a few things from the past - the best of the past. Concluding their article on the "teaching of science with a focus on values" Harmin, Krischenbaum and Simon (1970) point out:

> ... where science touches upon people's lives, values pertain. Where there is lack of values, our community life festers and sours. Where there is confusion of values, we work at cross-purposes, and our problems become exacerbated. History must not record that we (in education) ignored the value issues and stuck to facts and concepts (of subjects only). To do so ... would prevent us from having a future at all.

It is perhaps most appropriate to review our primary education programmes mainly because of the general belief that the existing curricula do not fulfil the requirements of wholesome education. The question of values will be one of the main foci of the task and how to improve this aspect of education. It is strongly believed that unless foundations for a quality education are laid whereby children in Bhutan will find their adult life personally satisfying and happy, socially useful and economically productive and peace-loving and empathetic, education does not do justice to the resources it consumes.

It is an old belief and practice that the new initiatives will take time to stabilise. At young age, we tend to resist pressure from the older groups and dismiss them as old-fashioned. The fact is that, as we grow older, such incidences will only repeat. Education is a continuous struggle between the old and young, but this struggle provides an opportunity for the culture and traditions to evolve and grow for the benefit of life and work. The ultimate aim of education is to refine character and to maintain continuity of life that brings peace and prosperity to the nation and people.

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Implementing Health and Physical Education Curriculum in Primary Schools in Bhutan: Inhibiting Factors, and Opportunities.

- Kezang Sherab

Abstract

The new Health and Physical Education (HPE) curriculum for the Bhutanese primary schools was piloted during the 1999 academic session in 22 primary schools across the country. This was the first initiative of its kind since the inception of the modern Bhutanese education system in the early 1960s. The idea of this study originated out of a genuine concern for the enhancement of the primary HPE programme. The focus of the study was to ascertain the inhibiting factors and opportunities experienced by the HPE pilot teachers and the students in implementing the new curriculum.

This study employed qualitative methodology, which incorporated a combination of narrative inquiry and phenomenology. The study was conducted over a two and a half-month period with four pilot teachers from both urban and rural schools in western Bhutan as participants. Data were collected through interviews, observations, field notes, reports from the four head teachers, and report summaries from the pilot teachers' workshop (Winter, 1999). Data were analyzed through developing coding categories.

The study ascertained that the pilot teachers are experiencing both intimidating impediments as well as some noteworthy opportunities in the successful implementation of the new curriculum. Some of the inhibiting factors included teacher expertise, lack of resources, the curriculum guide itself, and the beliefs and attitudes of teachers, students, parents, and administrators about HPE. The findings also suggest that in order for the Bhutanese HPE programme to be appropriately implemented, HPE teachers need to enhance their understanding of the subject and stakeholders need a common vision. They should be able to visualize HPE as active healthy living, not competitive games and sports per se.

Introduction

The formal Health and Physical Education (HPE) curriculum was not given a place in the Bhutanese education system until 1999 due to other educational priorities of the Royal Government of Bhutan and mainly because the need for it was not really felt. Although Bhutan did not have a formal HPE curriculum in the schools, various forms of physical activities existed in the past. First, as an agricultural country, working in the field was a good form of physical activity (PA) for many Bhutanese people. Second, people often travelled from one place to another on foot and students walked a few miles to attend their schools. Directly or indirectly, people got a satisfactory amount of exercise through these activities. Third, people also got exercise by participating in such traditional sports and pastimes as archery, dart, *degor* (played by males throwing a pair of flat stones at the hidden peg at a distance of about 20 meters), folk dance, mask dance, and wrestling. Fourth, there was a physical training (PT) programme in the schools which was implemented rigorously up until the mid 1980s (Dr Jagar Dorji, Director, NIE, Paro, personal communication, June 2000).

Some schools still continue these drills. Now with the advancement of modern science and technology, people are becoming more inactive and are leading sedentary lifestyles. Machines have replaced much of the manual work done in the past, thereby depriving many Bhutanese people of an important source of PA. As the country adopts more practices from the western world, youths are opting for a more sedentary type of lifestyle. Socially unacceptable behaviours such as drug abuse, violence, sex are becoming part of youths' lives (CAPSD, 1999). Given these challenges, a HPE curriculum has been added to the primary school curriculum. Therefore, the main purpose of this study was to examine how this programme is being implemented in schools.

Literature review

> *If to do were as easy as to know what to do, chapels had been churches, and poor men's cottages princes' palaces.*
> Shakespeare: **The Merchant of Venice.**

I examined the implementation of the primary HPE curriculum in the Bhutanese schools as a big change initiative in the system. To implement educational change successfully, it is crucial that change practitioners have a deep understanding of the complex process of change as well as the content of the change (Tompkins, 1998). According to Lang, Oslon, Hansen, & Bunder (1999), the changing education system has a great impact on the work of teachers.

When change occurs in schools, it is teachers who are directly or indirectly affected. Teachers may find it difficult to cope with change because they work within their own beliefs, values, and practices, many of which have been developed and reinforced over time. For teachers, change means doing something different.
Bridges (1991) states that "Inevitably accepting something new often means letting go of something old" (p.52). These new demands often put teachers into critical situations. For instance, research has shown that if teachers are not in touch with the theoretical orientation of the change initiative, the change is likely to be superficial (Ray, Lee, & Stansell, 1985). Likewise, the teachers' philosophical orientation also plays a vital role in making the change process successful (Chen & Ennis, 1996).

Values and beliefs underlie everything teachers do. Often teachers are unaware or unconscious of their belief systems. Therefore, in the process of educational change, teachers have to confront, challenge, and sometimes change their beliefs, values, and practices. Many teachers find this difficult to do. Reforms which do not consider the important role teachers play in change are often met with resistance (Fullan, 1992).

White (1990 as cited in Alyce, 1994) also acknowledges the important role of teachers as change agents when he writes, "It is with the teacher that school improvements occur, not with the specific idea, curricula, organizational or structural change" (p. 6). In every school, teachers teach within a work culture that has been built up over time and is a result of "an intricate web of shared values, norms of behavior, personal relationships, and perceived individual strengths and weaknesses" (Myers & Simpson, 1998, p. 66).

The unique work culture of each school affects how things are usually done in that school. When attempts are made to change, it is accomplished through that work culture. Many educational writers (Mann, 1979; Fullan 1992; Lang, Oslon, Hansen, & Bunder, 1999) argue that without significant changes in the work culture of the teachers and school culture, it will be difficult to implement change in the school. Physical educators like Raymon (1991) also emphasize the important role teachers play in the change process. Raymon (1991) comments:

> If teachers, already coping with a multifaceted role and other numerous pressures, are faced with organizational and curriculum change in a way that sees them ill-prepared and ill-equipped, then conflict, tensions and anxieties will emerge (p. 38).

The cultural realities of the school and teachers cannot be overlooked while implementing change because change has to take place within this culture.

According to the literature, failure to implement new educational programmes such as HPE is due to a lack of support for the programme, poor facilities, lack of understanding of teachers' subject matter, lack of ownership, and school culture. Do all these factors apply to the Bhutanese context, and particularly to this brand new curriculum? As a researcher, I was curious to examine these aspects of implementation. Will the change to a new HPE programme really take place? How confident are teachers with HPE content knowledge? Do they get enough support and to what extent do they have a sense of true ownership for the change?

Method

This study explored and investigated the inhibiting factors as well as the opportunities experienced by teachers and students as the new Bhutanese primary HPE curriculum was being implemented. To carry out this investigation, a qualitative methodology was used. Through such an approach researchers can better understand human behaviour and experience (Bogdan & Biklen, 1998). This approach enables researchers to learn through their own eyes about the social world they are investigating by means of involvement and participation (Hitchcock & Hughes, 1995). Therefore, this study was exploratory in nature and included a combination of narrative inquiry and phenomenology.

Setting and Participants

To make this investigation meaningful and worthwhile, the participants were selected based on the following criteria: teachers who piloted the curriculum (two male and two female), a variety of school levels (two primary schools, classes PP through six; two junior high schools, classes PP through eight) and a limited number of samples (four). Two of the schools were located in an urban area, while the other two were located in a small community away from the nearest town.

Research Tools

"Participant observation" and "interviewing" techniques (Taylor & Bogdan, 1998; Hitchcock & Hughes. 1995; and Merriam, 1998) became the two major tools for data collection.

Credibility

In order to build credibility and to establish trustworthiness in the research, I strived to ensure "internal validity, reliability, and external validity (Merriam, 1998).

Data Presentation and Analysis

Themes

After reading the interview transcripts, field-notes, reports from head teachers, and report summaries (feedback from the winter workshop, 1999) from other HPE pilot teachers around the country several times, themes and patterns were developed by coding the data (Altrichter, Posch, & Somekh, 1998). Two substantial themes and patterns became evident from the data triangulation. As the data were read and re-read, these themes occurred repeatedly.

In the researcher's imagination, a piece of cloth woven together with different eye-popping patterns was seen. The careful observation and analysis of this beautiful piece of cloth led to categorization of two main patterns: factors inhibiting effective HPE classes and opportunities for successful HPE classes. As further analysis progressed, many visible themes emerged from these patterns. Thus, the pattern of inhibiting factors in implementing the HPE curriculum was woven together by three main strands or themes - human inhibiting factors, physical inhibiting factors, and inhibiting factors related to the curriculum guide. In a like manner, the pattern of opportunities for successful HPE classes were discovered to be entangled within three main strands or themes: human opportunities, physical opportunities, and opportunities related to the curriculum guide.

Discussion

Through this study, it has been determined that various aspects of the new primary HPE curriculum may be difficult to implement in Bhutanese schools. The inhibiting factors are inter-linked to each other and must be diminished in order to ensure that school HPE programmes are more effective and have the opportunity to flourish. However, a number of accomplishments and opportunities have also been ascertained in this study. Quite surprisingly, even though each school was different in size and location, many of these difficulties and accomplishments were common to all the four schools studied.

Although various barriers and opportunities have been ascertained, one cannot generalize the findings and pronounce that all other schools in Bhutan where the HPE curriculum has been implemented are encountering similar implementation issues. Although it is advisable to

be cautious when attempting to generalize the findings of a particular study, various precautions have been taken to enhance the possibility of transferability with this research. First, the use of multi-sites allows the reader to apply the findings to a wide variety of situations. Second, precise descriptions of school contexts assist readers in comparing the study with their own situations and applying the findings accordingly. Third, as far as possible, the findings are provided with rich description to help readers determine how close their situations match the research situations and correspondingly judge whether findings could be generalized or not.

The implementation of the primary HPE curriculum, which is the first of its kind in the history of the Bhutanese education system, is a big change initiative. Therefore, discussion will be highlighted and connected in terms of the process of change while keeping in mind the aims and objectives of the programme. The idea of "managing complex change" has been adapted from Kilcher (1994) and the template (See next page) has been used to formulate the data analysis.

According to the template, in order for a change initiative to be effective, eight critical elements must be present. They are: vision, attitude, collaboration, skills, incentives, resources, action plan, and evaluation. Change is likely to take place only if all these elements are in place. For instance, if a change initiative is lacking clear vision, there is going to be some confusion. In this particular context, if Bhutanese HPE teachers and head teachers do not have clearly projected aims and objectives of what they are doing, there will be chaos and confusion. If they do not have a positive attitude, there is going to be resistance to the change initiative. Likewise, if people (change agents) are not skilled, it will lead to anxiety, and if there are no resources available, frustration among the practitioners will arise.

The findings from this research confirm that Bhutanese HPE teachers have an inadequate theoretical and pedagogical orientation to the subject. They, therefore, have a variety of visions of what HPE is about. What they value and believe in will have a strong influence on this programme. They may or may not realize that the real purpose of a HPE programme is to develop physically active lifestyles, not competition and sport. Without understanding the intent of the programme from their inner self, not much change will take place.

Much research has been carried out in the area of HPE to prove that the content is essential to experience success (e.g., Byra, M. 2000). It has become crucial that a comprehensive in-service programme relating to attitudes, skills, and knowledge of HPE needs to be put into place. Current research on educational change indicates that unless we acknowledge the vital role teachers play in making the reforms successful, not much change will take place (Dorji, J. 2003; Fullan, 1992; Lang et al. 1999).

Findings from this study suggest that Bhutanese HPE teachers are not adequately prepared to implement this new programme. They lack skills, time, resources, support and guidance which indicates that their role as reform agents was not recognized. Sarason (1999) rightly comments, "... if it is important and not recognized, efforts to introduce substantive change, particularly in the classroom, result in the illusion of change" (p. 110). Without equipping teachers with the necessary skills to deal with

the HPE curriculum as well as the change process, they cannot be held accountable for what they do. When there is no accountability, reform efforts are bound to fail. It is critical to consider the readiness and capacity of the change practitioners.

Teachers' lack of awareness about the real purpose of the HPE curriculum was evident, and it has been discovered in this study that Bhutanese HPE teachers' classes were competitively structured. Activities organized by other organizations such as the Bhutan Olympic Committee and Youth Guidance and Career Counselling Division were also found to be based on competition. There seems to be a huge gap between what the literature says and the existing practice in Bhutanese schools which is based on the curriculum guide. It is crucial to remove this existing gap.

Fortunately, HPE is still in its implementation stage, and there are many more schools that have not yet implemented the programme. There is still time to act by providing more in-service trainings and making teachers, students, parents, and head teachers aware of the purpose of the HPE programme. Their philosophy of HPE needs a major shift: a shift from sports to movement education, from competition to cooperation, from a traditional militaristic approach to a modern activity approach, and from fitness for fitness testing to fitness for health. It is imperative for them to understand that the new approach to HPE has more to do with movement education, not competitive games and sports. The focus should be on learning through cooperation and maintaining fitness for health.

Successful implementation of this programme will largely depend on teachers' pedagogical and content knowledge. It was observed that participants were not able to do anything for their disabled children. This issue needs to be given immediate attention, and the HPE programme should be designed toward a more inclusive approach. Bhutanese children with physical disabilities need to acquire access to PAs like every other child in the school. It provides opportunity for HPE teachers to learn how to conduct classes for disabled children. This is a wonderful opportunity. When disabled children are included in a class, other students in the class also get the opportunity to interact and work with disabled children.
Research has shown that HPE has potential to help disabled children socialize (Taub & Greer, 2000). As well, other regular children also get an opportunity to learn acceptance, to realize that the world is not perfect, and to learn that each human being has inherent worth. It is significant to learn such values at a young age.

> On the other hand, without adequate materials and basic infrastructure, the implementation of the HPE curriculum in the Bhutanese primary schools is likely to be a superficial innovation. A trained HPE teacher may be able to manipulate the situation and conduct a sound HPE class in the absence of adequate facilities and materials. We cannot expect this from the present Bhutanese HPE teachers without adequately preparing them to cope with less than ideal conditions; they lack essential skills. According to the change template, if change practitioners lack skills, anxiety will result. This is true in this situation.
>
> During the study, it was observed several times that the participants were in a state of tension and anxiety. For instance, Mr. Dorji reveals a state of tension when he says

I do not know anything about gymnastics. In such cases, it is often difficult to take class. (Interview 1, date 10/6/00, p. 3).

Likewise, the other three participants also revealed a state of difficulty when they said that they do not have adequate experience or knowledge to teach HPE. When change practitioners do not have required skills and knowledge to deal with the change initiative, there will be no ownership (Sarason, 1996; Fullan, 1999). Without a true sense of ownership for the programme, implementation of the primary HPE curriculum is unlikely to be successful.

In order to solve such problems, there has to be satisfactory support and guidance provided to the teachers. The HPE lecturer at the NIE (CAPSD) in Paro, who monitors the implementation of the HPE curriculum at the four primary schools in Paro, has the same view. He says, “lack of facilities, materials, and misconception in physical education are some of the problems.” At this point, the knowledge of our HPE teachers, who do not have much background information on the subject, is very narrow.

Pilot teachers and head teachers in the field have stated that they do not have enough balls, soccer fields, basketball courts and other facilities and equipment. This may indicate the type of attitude and orientation they have toward the subject. It seems that to them HPE must include only balls and playing fields. This may suggest that the one week in-service training, together with their life experiences, did not shape their understanding of HPE towards a more cooperative stance. Under such circumstances, realizing the goals outlined in the curriculum may remain remote. If teachers are provided with enough facilities and equipment, they will be able to offer more activities. Hopefully, they will also be able to look beyond HPE as based exclusively on competitive sport activities.

The significance of support and guidance in making the change process successful has been made clear by Lieberman (1995) in her definition of teachers' and students' work:

Work is defined not only as what teachers and students do, but also as what principals, practices, and policies enable them to do in different settings over time (p. 7).

If teachers are not given adequate support by principals and if school policies restrict them from doing certain things, reform efforts will be minimal, no matter how much teachers are curious and committed. Tompkins comments, "As goes the principal so goes the school" (personal conversation). What principals value or believe in has a strong influence on the school. It is crucial that principals (head teachers), in keeping with sound educational philosophy, value school HPE as a programme equal in merit with other subjects in their schools.

All four head teachers in this study had a positive attitude toward HPE and valued HPE as an important subject for their students. However, in their capacity as a head of the school, they could have provided more support to their HPE teachers to make the programme successful. For instance, in School Two, the pilot teacher reported that in spite of her repeated reminder, there were always a few students who did not bring their activity attire.

Under such circumstances, head teachers could play a vital role. If head teachers insist and give more importance to such issues, it would carry more weight. Likewise, if head teachers of the other three schools were also concerned about the HPE programme in general and the safety of their students, such issues could have been overcome. It was evident that this programme did not receive the required support and there was no proper follow up for the pilot process. It was up to the pilot teachers to decide how to implement the process. Some other pilot teachers did not even pilot the programme. To make the change process successful, support must be coupled with pressure, otherwise it will lead to waste of resources (Fullan, 1992 and Raymon, 1991). If there is no pressure and no efficient follow up procedure, people tend to be less inclined to follow through.

The template on managing complex change indicates that if resources are missing, frustration among the change practitioners results. This is precisely what is happening with the implementation of the newly developed HPE curriculum in Bhutanese schools. Teachers are getting frustrated because of the paucity of resources. If proper deliberation is not done on the various inhibiting factors, the programme will not be appropriately implemented and ultimately children will be affected because they will not get an opportunity to experience a well-developed HPE programme. The problems related to shortage of materials and facilities have also been brought up by many other pilot teachers during the pilot teachers' workshop (report summaries winter workshop, 1999). Such issues need to be addressed if the aims and objectives of the programme are to be accomplished.

As well, it should not be disregarded that people learn by making mistakes. Such difficulties must be regarded as an opportunity to learn and develop. Perhaps, a scarcity of facilities and materials could be an occasion for our teachers and students to gather new ideas and approaches for teaching that do not rely on sophisticated equipment. Many educators in the west, such as Brown & Moffett (1999) and Fullan (1999), believe that disorders and disequilibrium are sources of order and balance. It is only when change practitioners encounter difficulties that they look for solutions, attempting to bring new meanings to a certain thing.

With the implementation of the Bhutanese primary HPE curriculum, teachers are encountering disorders and disequilibrium giving them an opportunity to seek solutions which would bring order and balance. For instance, lack of equipment has been discovered as an issue for Bhutanese HPE teachers. This difficulty provides opportunities to look for better ways to teach HPE effectively with improvised or less

equipment. In the process teachers, administrators, and students will be able to incorporate their existing culture with the changing requirements of society.

HPE attire was another dilemma shared by the pilot teachers during the HPE teachers' 1999 workshop. With regard to attire, it is a constraint associated with the attitudes and beliefs of teachers and students/parents. It was observed that teachers themselves, excluding Ms. Deki, do not change for HPE class. The only justification they come up with is the lack of 'time'. Due to the shortage of teachers in the schools, HPE teachers have to teach other subjects too, therefore, they do not find enough time to change for HPE class. This is a reasonable justification. However, it is very important that both teachers and students come in proper attire in order to make HPE classes more effective.

All the participants except School Two reported that it would be difficult for their students to take care of extra things in the school as there are no lockers available in the schools. Problems involving students' inability to care for their personal possessions and to wear their uniforms can be good lessons for children and teachers. Children could be taught values such as responsibility, respect towards others, the value of time, and independence that are essential to function in a society. Research indicates that HPE has the potential to nurture pro-social behaviours, in addition to learning movement concepts (Hichwa, 1998). Moreover, it is important to have proper HPE attire from the safety point of view.

Our education system believes in the importance of teachers as good role models. If teachers wear appropriate attire for HPE like the pilot teacher of School Two, the students certainly will do so. Teachers should not overlook that such hidden parts of the curriculum play a vital role in the life of a child. If HPE teachers and head teachers are able to convince students/parents that it is essential to have proper attire for their own safety and for maximum learning, the situation will improve.

Lack of time was identified as another hindrance. Many teachers expressed their grievances for not being able to find ample time to fulfill their programme requirements. Without providing adequate time to learn new skills, implementation will be less effective. According to the template on managing complex change, provision of adequate incentives to change practitioners plays a significant role. Therefore, provision of incentives such as adequate time, exposure, adequate equipment/facilities is critical to successful implementation of Bhutanese HPE curriculum. In the absence of such incentives, it will be difficult to get change practitioners motivated. Without motivation, it will be difficult to generate commitment and interest among change agents. As a result, it will remain as innovation without change.

According to the change literature, change is a complex process; it cannot happen overnight or within a few months (Lieberman, 1995; Fullan, 1999). The findings from the research confirm that a change initiative will be successful only after a duration of many years, where there is both good understanding of the change initiative and the change process itself. Change needs continuous support, monitoring, and guidance from everybody involved in the programme. The implementation of this new primary HPE curriculum in Bhutanese schools is an initiative that is undergoing a stage called

an "implementation dip" (Sarason, 1996). This is a usual phenomenon with any change initiative.

Therefore, judging from difficulties encountered by the HPE teachers, we cannot draw an inference that the HPE programme is not going to be successful in Bhutanese schools. It is critical that stakeholders address such issues confirmed in this study to better implement the innovation. Change agents need to have a lot of patience, consistency, and confidence in what they are doing to emerge out of the implementation dip. It must be understood that change is not possible without confusion, conflict, resistance, anxiety, and dilemma (Lieberman, 1995; Fullan, 1999).

Findings from this study suggest that the competitive model continues to be the main activity HPE teachers engage in. This may work against the cooperative goals of the new HPE curriculum. During the research, it was observed that competition allows the highly skilled children ample opportunities to practise skills and games learned in the class. However, 80% to 90% of the children do not get such exposure, and they are the ones who may most need the skill development. The curriculum aims to have all children, irrespective of their ability or gender, to get adequate opportunities to actively participate in PAs.

It is important for a child to learn such fundamental skills when they are at the formative age (Pangrazi, 1998). One of the aims of the HPE programme is to "develop the motor skills which will be used in games, sports, and recreational activities throughout a healthy active life" (CAPSD, 1999, p. 2). If such fundamental skills are not taught appropriately, how can Bhutanese children develop their motor skills? So in order to fill the existing gap, there needs to be some rethinking and activities have to be distinctly explained and taught to the appropriate class level. Comer, as cited in Parkey and Hass (2000) comments, “Young people learn at an adequate to optimal level when they are able to meet their developmental needs” (p. 153). Therefore, it is vital to design a curriculum with developmentally appropriate learning experiences for the students.

Findings suggest that not much emphasis has been given to indigenous activities. To make the curriculum culturally relevant, it is crucial that activities such as folk and mask dances from different communities and sports such as archery, *degor*, and wrestling are included in the curriculum. Students from different ethnic groups would be able to learn about each other’s cultures. Many curriculum designers and writers (e.g., Parkey and Hass, 2000; Cross 1995 as cited in Beane, 1995) believe that curriculum should be culturally relevant. Also, we should acknowledge the PA Bhutanese children already get by walking, especially in remote schools - in some cases up to eight or nine kilometers to school everyday.

All these inhibiting factors have strong implications for teacher preparedness. Without properly preparing HPE educators, not much is likely to change. Much emphasis needs to be given to participation by all students through cooperative activities. Therefore, the Bhutanese HPE programme should be modeled on a more inclusive approach that incorporates dance festivals, soccer festivals, marathon, hikes, trips into nature, and so on, where the focus is participation and celebration rather than competition.

The presence of various impediments in implementing the programme itself provides opportunities to make the programme realistic and achievable. Research indicates that such impediments have to be viewed as a source of creativity and improvement, thereby making the teaching-learning process worthwhile and productive (Brown & Moffett, 1999). However, one should be aware that simply considering the obstacles as opportunities is not going to be of much help. Everyone involved in the school needs to change their attitudes, beliefs, and values by developing a collaborative working atmosphere that focuses on HPE goals and aims.

Often our schools and teachers work in isolation where there is not much collectivism, sharing, and equity. This is exactly what the change template indicates. Without collaboration there will be isolation. Bhutanese teachers need to observe each other's lessons, share ideas and facilities, and not be confined to their own classrooms. A spirit of "our" classroom, "our" school, and "our" facilities needs to be developed from the existing culture of "my" classroom, "my" school, or "my property". Without acknowledging the importance of working together, not much change will take place. School cultures that are isolated will create incoherence in a system. This acts as a dominant inhibiting factor preventing the change process from being successful. No individual can bring about change on his/her own. What is more tangible is change through a collaborative effort. Fullan (1999) rightly remarks:

> Collaborative cultures are innovative not just because they provide support, but also because they recognize the value of dissonance inside and outside the organization (p. 27).

Collaboration within the school, with other schools, and with the immediate environment is fundamental to the successful implementation of change. As well, it is also imperative that Bhutanese teachers inculcate a sense of equity in their classroom. According to Tompkins, equity is not just treating everybody equally, but treating students according to their needs (personal conversation). Teachers should be able to cater to the needs of a variety of students in their classes and create a safe HPE environment where all students feel accepted, appreciated, and respected for who they are (Hichwa, 1998).

The inhibiting factors include time, teacher preparedness, resources, and facilities. HPE teachers can take this opportunity to improvise equipment from available local resources. For instance, if a school needs jump ropes, they could make them from locally available materials. Stones are an excellent substitution for shot-puts. What is of importance is to show the correct techniques. The quality of the equipment should not matter. Likewise, in the absence of adequate facilities, the surrounding environment could be better exploited. Taking children out into the forest for orienteering lessons, scavenger hunts, hiking or perhaps for walks can be a good basis for a HPE lesson. Therefore, at times, a lack of facilities and equipment are a blessing in disguise for our teachers and students.

However, while trying to bring about some changes in the existing culture of schools, a certain degree of uncertainty has to be tolerated. Change practitioners have to be encouraged to take risks and to try new ways and means to make the programme successful. Research indicates that taking risks to learn something new is crucial in making any change process successful (Brown & Moffett, 1999; Lieberman, 1998;

Fullan, 1999). For instance, our HPE teachers cannot bring about much change if they continue to make disabled children sit and watch while other children participate in various activities. Instead, they should take risks and explore various possibilities.

In the beginning, change practitioners may become disappointed and frustrated, but that is often the nature of change. Often, after several attempts to improve a situation, one tends to give up and return to previous behaviour that is more familiar and comfortable (Brown & Moffett, 1999). This is not a good learning strategy. Zerubavel (1979) as cited in Connelly & Clandinin (1988) says that things that remain unnoticed as a part of daily life are like "invisible glass walls." One realizes they are there only when one walks into them.

In order to learn new ideas, one should take risks and walk into the glass walls. As a result, new ideas and methods to improve our primary HPE programme will be learned. It is true that "the risk of being wrong often goes with the opportunity to learn something new" (Altrichter et al. 1998). Without daring to walk into the glass walls, no significant change will take place. Great achievements involve great risk. However, research indicates that change practitioners should be given opportunities to take risks and should not be punished when they make mistakes (Tompkins, 1998). When people are punished and discouraged for what they have done, they get de-motivated. Bhutanese HPE pilot teachers in particular and all other teachers in general are not encouraged and supported to take risks.

RECOMMENDATIONS FOR EFFECTIVE CURRICULUM IMPLEMENTATION

The most significant task facing the successful implementation of the new HPE curriculum in the immediate future is to minimize all these stumbling blocks and dominant constraints to make sure that this new programme is well established. It is not a question of whether or not conflict will arise, but how these conflicts are going to be handled. It is imperative that the impediments discovered in the study are taken care of early for successful implementation of the programme. In order to overcome these issues and to minimize the difficulties encountered by Bhutanese HPE teachers, the following suggestions should be considered. Recommendations are categorized under a need for teacher understanding, better support and leadership for teachers, and a more appropriate curriculum guide. These three themes will be discussed in more detail in the following section.

TEACHER UNDERSTANDING

1. All the inhibiting factors that have been discussed have a significant implication for **teacher preparation**. Most of the problems faced by our HPE teachers are directly related to teacher expertise, beginning with content and pedagogical knowledge and continuing with beliefs and attitudes. Research findings confirm that Bhutanese HPE teachers lacked both content as well as pedagogical knowledge to effectively teach HPE. It was discovered that they also lacked proper understanding of the new HPE programme and its potential. The problems discovered from the research could be reduced if HPE teachers were prepared more thoroughly. Therefore, it is strongly recommended that teacher training institutes consider offering HPE as a teaching subject. In the mean time, in-service programmes for HPE teachers will have to be organized. Given limited facilities and equipment, it is imperative that in-service

programmes give more focus on preparing teachers to teach HPE with limited resources and facilities.

2. More emphasis will have to be given to teaching PA by creating a **non-competitive environment** to encourage individual development. The traditional team-sport approach to HPE and the militaristic methods of forcing exercise can cause our students and parents to under-appreciate HPE. When competition is emphasized, it does not encourage development of movement skills or concepts for all. Teachers should stress participation by all students through cooperation, not competition. Schools and organizations like the Bhutan Olympic Committee and Youth Guidance and Career Counselling Division are doing an excellent job of organizing sports activities for our students. Instead of emphasizing only sports competition, they could also plan more inclusive approaches such as dance festivals, soccer festivals, walks for fitness and so on, where the main focus is participation and celebration rather than competition.

3. While it is true that adequate **facilities and equipment** are indispensable to conduct HPE classes, it does not mean that people cannot be innovative and make use of available resources and space to explain and carry out various activities. In the Bhutanese context, where the government and parents cannot afford to provide sufficient funds, it is important for our teachers to improvise with whatever is available. For instance, it is not mandatory to have a real javelin to teach children the proper technique. Javelins made out of poles can serve the purpose. If teachers are creative and make the best use of available resources within their local communities, they will make a great contribution to both the education system and the community.

The demonstration of appropriate techniques is more important than the availability of specific equipment. In fact, many activities could be carried out without equipment and facilities; children would still learn the importance of HPE. Teachers need to learn and understand that the main goal of the HPE curriculum is to educate children to maintain their health through PA, not to emphasize competition and the importance of winning. For instance, taking children jogging, engaging them in aerobic exercise or orienteering lessons are forms of PAs that require little or no equipment and facilities. This will be successful only if teachers demonstrate patience, commitment, and a love for their profession. As teachers become more knowledgeable about HPE, they will be able to think of many ways to improvise equipment.

4. The next strategy that teachers could adopt to minimize the problem of equipment is to **plan separate activities** depending on the materials accessible. For instance, teachers could plan one or two activities that involve the available equipment and one or two that do not require specific equipment. The activities could run simultaneously, and the students could switch groups after a specific amount of time.

5. At this point, it is important to spend some time developing a dialogue with teachers, students, head teachers, and parents to help them understand the importance of HPE. A good **communication** link needs to be developed. This could be done through organizing literary activities such as debate, quiz, essay writing, and short plays. It could be also done through mass media such as writing articles in the national newspaper and CAPSD newsletter and radio and television broadcasts. Everyone should be able to clearly articulate why HPE is important. If they fail to

recognize the value of HPE and have negative attitudes, they lose the opportunity to proceed ahead toward common goals (Brown & Moffett, 1999). As a result, reform efforts will remain as innovation without change.

6. A shortage of **time** is a hindrance to the HPE programme in a number of ways. If HPE teachers and head teachers are committed and give priority, it is possible for schools to make arrangements with class scheduling that would to some extent curtail the HPE time spent inactively. One improvement would involve scheduling HPE classes just before the break. For example, one HPE class could be held before the morning interval, the next class before the lunch break and another before the evening break. Both teachers and students would then have abundant time to change their attire.

7. Findings suggest that due to limited facilities and equipment **large numbers of students in a class** (40-45) is a hindering factor to successful implementation. Although it is generally true, more students in a HPE class can also be an opportunity to hold effective classes. For instance, more students provide opportunity to divide the class into enough groups or teams to carry out the activity effectively and efficiently. On the other hand, if there are very few students in a class, it does not allow enough members in a group or team. However, in terms of class size, there is not much that can be done at this point. In order to reduce large crowds and confusion, it would be practical to use learning stations. Children could be sent to different learning centres with different activities and then rotate after a specific amount of time. This could save both teachers' and students' time and the teacher could also give individual attention while moving from group to group.

8. No HPE teacher can be well educated in all the content areas of the curriculum. For example, a teacher may have a good understanding of all the content areas, except dance. In this case, inviting a **guest speaker** or instructor from the local area would minimize problems. Likewise sometimes health workers could be invited to give a talk to the students. A ten-minute talk by the right person would be more worthwhile than a two-hour lecture by someone who is not trained in that field.

SUPPORT AND LEADERSHIP

Implementing change requires appropriate support and leadership. It could be difficult for Bhutanese HPE teachers to implement the new programme successfully if they are not given proper support to make the programme more effective and worthwhile. The following issues need to be addressed:

1. As the nature of the HPE programme involves a lot of movement, there is a potential for injury. Therefore, conducting HPE classes in **proper activity attire** is crucial to minimize potential hazards. HPE teachers, head teachers, and parents will have to take the responsibility of conducting HPE classes in a safe environment that includes appropriate attire. This is more of an administrative job. Head teachers would have more influence than the HPE teachers would in making such decisions. As stated earlier, as goes the principal, so goes the school.
However, a collaborative effort amongst the stakeholders would play a significant role in realizing this safety measure in schools. If schools could provide shorts for their children (especially rural areas), it would be an important consideration for many

children who cannot afford to buy them. Otherwise, much emphasis needs to be given so parents will buy them for their children. Any poor family could afford to buy a simple vest and shorts for their own child. Proper class scheduling, as suggested under the first theme, would minimize much confusion caused by lack of time to change attire. However, it is strongly recommended that both students and teachers bring a change of clothes.

2. The HPE programme has to be monitored properly with adequate support and guidance from the district education authorities as well as from the Curriculum and Professional Support Division. As the change literature says, sometimes some form of pressure is important to help people work in the right way. The change template says that if there is no follow-up or evaluation carried out, the impact of the change initiative will go unnoticed. Curriculum officers and other resource individuals should provide their expertise from time to time. This could be done through **professional development** days, winter institutes, and inter-school visits.

3. HPE teachers should be urged to walk into the invisible glass walls and experiment with different teaching **strategies and approaches**. One cannot learn unless one makes mistakes. They should develop their own plans and execute these plans with patience. In doing this, teachers should be willing to devote extra hours to planning and preparation. This would also help Bhutanise our HPE system, helping us develop our own home-grown solutions in the Bhutanese context.

4. In order to make the change process successful, Bhutanese schools need to develop a **collaborative working environment** and break the walls of isolation within their own school, as well as with the schools from the neighborhood. Getting trapped into a self-sealing world will not result in any concrete changes. This is based on the philosophy that two heads are better than one. If teachers discuss and observe each other's lessons, there will be much to learn from each other. What is more important is being able to value sharing of expertise. For instance, one teacher in a school may be good in dance and another teacher in the same school or from an adjacent school may be good in gymnastics. So if one could share one's expertise with others, the new elementary HPE programme would benefit greatly.

5 The difficulties involved with **weather** could be curtailed, to a larger extent, if our teachers planned activities according to the seasons. For example, dance and movement, gymnastics or aerobics could be scheduled for the monsoon season, as these activities could be conducted in the classroom or multipurpose hall, as they do not require much space or equipment. Moreover during the monsoon, some theory lessons could be provided on topics such as the history of various sports, rules of various sports, importance of exercise, health and hygiene, designing individual fitness programmes and so on. This can be achieved by publishing a suggested HPE schedule that fits with the seasons and sharing it with both HPE teachers and head teachers.

CURRICULUM GUIDE

In spite of the fact that the Bhutanese education system does not have many trained

HPE experts, the HPE curriculum committee has developed the present curriculum which is in line with the present philosophy and principle of wholesome education in Bhutan. However, the existing HPE curriculum needs to be thoroughly reviewed and necessary changes have to be made to provide more challenging, relevant, and cognitively engaging activities. The following must be reviewed:

1. Some **activities** such as corner spry, bogey ball and so on will have to be simplified by providing more complete explanations. Descriptions (instructional cues) of how to perform fundamental skills must be included in the curriculum. For instance, if the skill to be taught is running, some of the critical instructional cues could be: to run on the balls of the feet, to keep the head up and the eyes forward, to bend the knees, relax the upper body, breathe naturally, and swing the arms forward and backward.

In order to make the curriculum guide more informative, more illustrations need to be added concerning proper attire. Gender bias needs to be avoided. Inclusion of some sample lesson plans will have to be taken into consideration. This will be useful for the teachers who do not have adequate content and pedagogical knowledge.

2. Less relevant activities such as baseball and cricket could be discarded and more simple and relevant activities could be included. The Bhutanese culture should play a larger role in the HPE curriculum. To make the curriculum culturally relevant, inclusion of more **traditional activities** like *khuru*, archery, local wrestling, and folk and mask dances should be considered. Although physical activities could be the same irrespective of cultural background, including national games and activities along with activities adapted from other cultures will make the teaching-learning process more practical and realistic. Children will be able to see themselves in the curriculum that they are experiencing. Therefore, inclusion of other traditional sports and activities such as archery, *khuru*, and *degor* have to be given serious consideration.

Besides achieving the goal of HPE, it will also help in promoting and preserving Bhutanese customs and traditions. Of course, these sports can be quite risky especially among young children, but they can also provide tremendous benefit for Bhutanese children. These sports can help children develop both fine and gross motor skills and provide an opportunity for them to learn and practise safety measures. If teachers can modify these sports, it will be a good learning experience for our children. Moreover equipment necessary for these local sports will be available without much difficulty as they could be obtained from local resources.

3. In order to maintain some kind of uniformity among schools and to support the claim that HPE is a subject in the schools, inclusion of some sample **assessment and evaluation tools** would be effective and useful for teachers to guide their teaching. The impact of the HPE programme will go unobserved without any form of evaluation being done (Change template, Fig. 2.1).

4. A well-planned HPE programme has the potential to ensure that students who attend regular HPE classes will be healthier both physically and mentally. This in turn has the potential to strengthen and enhance students' abilities to learn. Therefore, if HPE is to survive as a subject in the schools it is crucial that it be given

equal **status** with other subjects. Unless it is treated in the same manner as other subjects, teachers and students will not be seriously committed. As a result, the HPE programme will be at risk.

Although all these suggestions demand commitment and understanding from our teachers and leaders, they are worth-considering. If our teachers are able to enhance their understanding of both HPE and change theory, the teaching-learning process will always be productive and fruitful. This programme in the school has the potential to instill a positive attitude toward PA and a life-long love for maintaining personal fitness in Bhutanese students. There is nothing more valuable in life than one's health. Therefore, special effort should be put into producing healthy citizens.

CONCLUSION

If the Bhutanese primary HPE programme is implemented successfully, it has the potential to play a significant role in the lives of Bhutanese children. It can inculcate a healthy lifestyle not only during children's school years, but also throughout their lifetime. It is very important to take care of one's body, which is the "home of the brain" (Pangrazi, 1998). In one's life, there is nothing more precious than physical well being and health. Pangrazi (1998) comments, "The ability to read becomes unimportant if one's health has degenerated" (p. 29). This is quite true because everything in this world would be futile without one's health and well being.

Therefore, if there is concern about the well being and if we treasure our future generations, the issues discovered in this study need to be addressed. Likewise, everyone involved in the implementation of the HPE programme needs to work in collaboration with a common vision: an active healthy lifestyle for every Bhutanese child, thereby producing physically educated children. Without a common goal and commitment among the stakeholders of the reform efforts, not much is likely to change.

Imagine that all people in the world, irrespective of their religious faith, believe in one Almighty God. The differences between various religious groups such as Muslims, Christians, Jews, Hindus, and Buddhists would be reduced and people would be able to live in harmony more easily. The more they focus on the meaning of the deity, the less divided they are. On the other hand, if people focus on religious differences, rather than their beliefs, then there is going to be a huge gap.

Under such circumstances, a state of harmony will be more difficult to achieve. This example should say something to Bhutanese HPE teachers, students, head teachers, parents and administrators. As long as they remain confused and unclear about their vision of quality HPE in the school system, there will be gaps between them that will make their task more difficult. Unless there is a common goal among all those involved and unless they are able to visualize HPE as an active lifestyle achievable through collaboration, the change initiative will remain as innovation without change. To successfully implement the new HPE programme, stake holders must have a clear vision, a positive attitude, and strong determination to work together in spite of individual differences.

* * *

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ECO-TAXONOMICAL STUDY OF THE NATURAL POPULATION OF HOGWEED OF BHUTAN: A PLANT OF POTENTIAL COMMERCIAL VALUE.

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ABSTRACT

The paper deals with the eco-taxonomical status of the genus Heracleum Linn. with special reference to Bhutan's ecological conditions. The taxonomical and phyto-geographical distribution, Himalayan species content and the potential commercial value are the focal aspects of the paper. The genus does exhibit some element of endemism. The agro-climatic conditions, medicinal value; potential threat and the probability of survival have been discussed. Besides many local uses in different parts of the world, the species under this genus are used for extraction of coumarin, a precursor of Xanthotoxin, an alkaloid which is the main component of sun-tan lotion used in the treatment of vitilago. Future need of study in Bhutanese environment has been emphasized.

Introduction

The genus *Heracleum* Linn., the hogweed, belongs to the family Apiaceae. There are 15 species reported to be growing in the Himalayas. The genus has wide range of economic uses such as food, fodder, spices, and perfumery; and also has a poisonous value (Kaul 1989, Mojab 2002). It is known as a very good source of furano-coumarin (Handa & Rao 1970, Aynehchi et al. 1978, Ghodsi 1976; and Merijanian et al.1980). These furano-coumarins can be converted into xanthotoxin, which is used in formulating sun-tan lotion. It is also used in the treatment of vitilago or leucoderma. Phytochemical screening of *Heracleum persicum* Desf. ex Fischer has already been done using root and leaf of the plant in Tehran (Aynehchi et al. 1978; Ghodsi 1976; and Merijanian et al. 1980). Ghodsi (1976) has studied flavonoids of three *Heracleum* species viz. *H. persicum* desf., *H. sphondylium* L. and *H. montanum* Schl.

Even though the genus is medicinally so important, it has failed to attract the attention of the scientists in Bhutan. Therefore, this paper is a pioneer attempt to study the growth, geographical distribution, medicinal value, and cultivation prospects with particular reference to Bhutan.

Materials and Methods

Several field surveys along with the students of the college were conducted in Eastern Bhutan. The specimens of *Heracleum* Linn. in vivo were studied in different parts of the study-area such as Kanglung, Khangma, Khaling, Wamrong, and Moshi. Existing

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herbarium specimens were referred to in the department. The taxonomic features and agro-climatic requirement of the plants in natural population were studied in the field. The specimens were identified with the help of literature (Hooker 1879, Grierson and Long 1999). The live specimens were studied in natural population and no collection of the specimens was made as winter was setting in and continuation of further work would not have been feasible. Therefore, further study related to this genus has been deferred to the next phase after the college reopens in 2004. Thorough scrutiny of literature has been done to collect the existing knowledge of the genus.

Result and Discussion

Taxonomy and Distribution

The genus *Heracleum* Linn. is a temperate plant. It occurs in temperate Europe, Asia, North America, and Abyssinia. It is represented by 50 species in the world and 21 species in India and adjacent countries such as Nepal, Bhutan, Sri Lanka, Myanmar, Pakistan and Bangladesh (Hooker 1879, Kaul 1989). But according to Nasir (1972), it is a fairly large genus with 70 species in the world. Recently, Grierson and Long (1999) have raised one more species from Bhutan i.e. *H. bhutanicum* Watson. In Bhutan, the genus is represented by only 7 species (Grierson and Long 1999).

Mandenova (1978) has segregated 15 taxa from this genus originating from Southern Asia (India and the Himalaya) and created a new genus *Tetrataenium* (DC) Manden. According to him, the morphological, micro-morphological, anatomical, caryological, and chemical data support the separation. He is quite emphatic in his view that the genus *Heracleum* Linn. occurs distinctly in the north of the Himalaya, the southern Asia being never implicated (Kaul 1989).

The genus is at the moment distributed in the Himalayas only. The species occurring in the North-West Himalaya, Central Himalaya and Bhutan (Eastern Himalaya) are enlisted in table-1 and Fig.-1 depicts distribution of *Heracleum* sp. in Bhutan only.

Botanical characteristics

Biennial or rarely perennial herbs with erect stems 0.2-2.5 cm, branched or unbranched. Leaves simple or 1-2 pinnate, segments generally lobed or pinnatified, never filiform, hairy or at times glabrous, undersurface grey or tomentose. Umbels compound; rays many. Flowers white and open in centripetal sequence. Most of the umbels are protrandrous. Calyx teeth 0 rarely small. Petals obovate, emarginated or bifid. Ovary pubescent. Fruit schizocarpic. (Fig.2-4)

Endemism

The genus exhibits discontinuous distribution which is endemic and interesting in nature. According to Kachroo (1983), the five species of *Heracleum* have restricted distribution and do not occur beyond Afghanistan towards the west; and western China towards the east. Kachroo further mentions that *H. pinnatum* Clarke and *H. thomsonii* Clarke occur in Afghanistan; *H. candicans* Wall. is reported from western China (Yunnan). *H. canascens* Lindl. and *H. thomsonii* Clarke var. *glabior* are endemic; the former restricted to western and Central Himalaya and the later to Kashmir-Pakistan and Laddakh.

H. bhutanicum Watson is a neo-endemic species. Grierson and Long (1999) did not report any record of the *H. candicans* Wall. and *H. canascens* Linn. from Bhutan but Kaul (1989) in a review treatment on *Heracleum* has reported their occurrence in Bhutan. The author also corroborates the findings of Kaul.

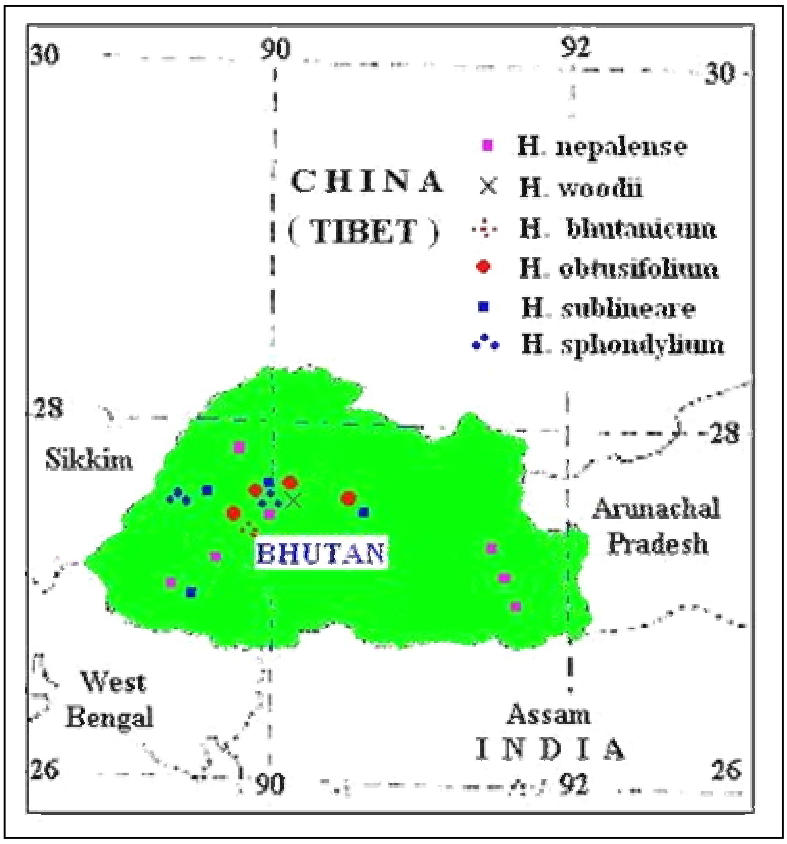

Fig. 1 –Distribution of *Heracleum* Linn. species in Bhutan

Fig.2 -*Heracleum sphondylium* Linn.
A habit with inflorescence

Fig. 3: *Heracleum nepalense* D. Don. : Habit (A) and Inflorescence (B)

C

D

Fig. 4- *Heracleum nepalense* D.Don. C- Seed , D- Root

Table 1: Distribution of *Heracleum* Linn. in the Himalayas

S.	N.W. Himalayas	Central	Eastern Himalaya
1.	*H. leucocarpum* Aitch. & Hemsl.	*H. obtusifolium* Wall.	*H. obtusifolium* Wall.
2.	*H. polyodenum* Reich. F. & Biadl.	*H. nepalense* D. Don	**H. bhutanicum* Watson
3.	*H. cachemiricum* Clarke	*H. nubigenum* Clarke	*H. sublineare* Clarke
4.	*H. pinnatum* Clarke	*H. wallichii* DC	*H. wallichii* DC
5.	**H. thomsonii* Clarke	*H. sublineare* Clarke	*H. sphondylium* Linn.
6.	*H. jacquemontii* Clarke	*H. lallii* Norman	*H. nepalense* D. Don
7.	**H. candicans* Wall.		*H. woodii* Watson
8.	*H. lallii* Wall.		
9.	H. *brunonis* Benth.		
10.	*H. nubigenum* Clarke		
11.	*H. nepalense* Don		
12.	*H. sublineare* Clarke		
13.	*H. wallichii* DC.		
14.	*H. obtusifolium* Wall.		
15.	**H. canascens* Lindl.		

* Endemic

Table 2: Yield of Coumarins in the three *Heracleum* sp.

S. No.	Coumarins	Quantity of Coumarins in different species (%)		
		H. canascens	*H.* pinnatum	*H.* candicans
1.	Xanthotoxin	0.005	0.005	0.05
2.	Imperatorin	1.50	1.0	2.0
3.	8-Geranoxypsorin	0.05	0.04	0.1
4.	Heraclenin	3.0	1.0	1.0
5.	HP-12	-	0.004	1.5
6.	Bergapten	0.01	0.01	0.01
7.	Isobergapten	-	0.001	-
8.	Sphondin	-	0.001	-
9.	Isopimpinellin	0.01	0.01	0.01
10.	Phellopterin	0.01	0.01	0.01
11.	Osthol	3.50	0.01	-
12.	Heraclenol	0.006	-	-
13.	Xanthotoxol	-	-	0.001

Source: Banerjee et al. 1979, Kaul 1989

Table 3-Total percentage of coumarins in the roots of different species

S. No.	Species	% of total Coumarins in the roots
1.	*H.*	7
2.	*H. canascens*	9
3.	*H. candicans*	5-16
4.	*H. nepalense*	2
5.	*H. obtusifolium*	1
6.	*H. pinnatum*	3
7.	*H. rigens*	6
8.	*H. sublineare*	6
9.	*H. thomsonii*	17
10.	*H. wallichii*	2

Source: based on Kaul (1989)

Table 4. Essential oil constituents of *Heracleum persicum* Desf. ex Fisch. leaves

No.	Compounds	%
1	β-Pinene	6.86
2	*p*-Cymene	7.93
3	2,5-Dimethyl styrene	9.68
4	Terpinolene	9.86
5	Stragole	12.73
6	Cis-Anethole	14.36
7	trans-Anethole	15.62
8	α-Caryophylene	19.91
9	α-Bergamotene	20.31
10	zingiberene	21.51
11	α-Farnesene	22.03
12	Spathulenol	23.83
13	β-Springene	37.67

Source:http://www1.tums.ac.ir/daru/DaruVolum10-No1-2002/Mojab.htm

Chemical constituents The genus as a whole is reported to be rich in furancoumarins which are convertible to xanthotoxin (Handa & Rao 1970; Banerjee et al., 1979) and many other essential oils as given in table 4. Mojab et al. (2002) have extracted oil by hydrodistillation (0.13%) from leaves of *H. persicum* Desf. in Tehran (Iran) and analyzed by GC, GC/MS and ^{1}H-NMR. Out of the many other components isolated and

identified (table-4) the major component was identified as trans-anethole (82.8%). Many species have secretory ducts enriched resin and essential oil. These oils only impart the genus a typical aromatic fragrance. The complete chemical profile of the genus in different species is tabulated in table no. 2 and 3. However the roots are very rich in furancoumarins. Kaul (1989) in context of Kashmir Himalaya has reported that there is significant variation in the coumarin yield from root depending upon the season of harvest, stages of harvest and location of harvest.

But with regard to environmental context of Bhutan, the genus is very scarcely studied. The further researches are required to study the genus in detail as far as the chemical constituents are concerned. The significance of *H. sphondylium* Linn., a species reported in Bhutan, is further enhanced from the flavonoid analysis conducted by Ghodsi (1976). It is needless to emphasize that almost all the species of *Heracleum* have chemical potentials rich in all parts of the plant i.e. from root to fruits.

Uses

Following are the uses reported by the ethnobotanical authorities:

1. According to Bhattarai (1997) *Heracleum nepalense* D. Don, locally known as 'chhatare' in Nepalese, two to three grams of the fresh fruits is made into a paste and eaten with warm saline water once a day for 4 or more days as carminative.
2. It is also said to possess antipyretic properties. The pounded fruits are applied on open wounds as a disinfectant, both in humans and animals.
3. According to Kaul (1997), the roots of *H. candicans* Wall. are sweet smelling and reported to contain coumarins which can be converted into Xanthotoxin, a chemical ingredient for preparation of sun-tan lotion and also possesses anti-leucodermal properties.

Local Uses:

- As antiseptic for cleaning the utensils such as butter churner with boiled leaves.
- As herbal bathing components.
- As spices in non-vegetarian preparations.
- As medicine against vomiting.
- Used in making pickles.

Threat

In north-western Himalayas, due to wanton collection of roots for medicinal purposes, the genus is under constant threat and Kaul (1997) considered it an endangered species. In the eastern Himalayas, the potential of the species has not yet been explored and therefore the threat from the exploitation and other biotic factors is minimal but abiotic threats are not ruled out. Natural disasters such as flood, landslide and the forest fires are some of the major threat to the genus.

Agro-climatic Preferences

The genus has been found growing luxuriantly in temperate climate. The chilling impact of the winter during December-February is a prerequisite for germination. The seeds germinate in spring. The genus is sensitive to hot and humid condition and the heavy rain is also detrimental. Therefore, the genus prefers a slope for fast run-off and

there is no chance of water-lodging. In cultivation practices also it will be important as the root is the commercially useful, and if this requirement is avoided, the roots will rot.

The genus has been found growing in the soils with humus that being rich, sandy–loamy. The pH of the soil is acidic ranging from 5.0-6.8. It has been observed that the herb is very suitable for growing on degraded forest ecosystem. It may also be helpful in restoration ecology. Kaul (1989) also corroborated this preference of condition through various cultivation practices on western Himalaya like Kashmir and Palampur in Himachal Pradesh.

Conclusion

The genus *Heracleum* Linn. has established medicinal properties from the researches quoted above. No doubt, it is a plant of potential commercial value and could be a prospective source of revenue for Bhutan. Therefore, to augment the existing scientific information on hogweeds of Bhutan, further but an intensive study on the following lines is required, which is in progress:

- Detailed agronomic study with cultivation prospects in vitro
- Breeding and harvesting in different seasons; and at different growing stages.
- Yield trial of root biomass and the active principles at different locations
- Chemical analysis with regard to essential oil and Coumarins
- Pathological threats to the population
- Environmental threats for the survival of the genus.

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A Tracer Study on the First Batch of B.Ed Graduates (July 2002) of the NIE, Paro.

- Dorji Wangchuk
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Background

The National Institute of Education in Paro does its best to give the best training possible to the pre-service teachers, but it is difficult to say whether what it has been doing has made any difference to the professional life of the teachers in the schools.

Quite a number of times, some senior teachers and the head teachers had made comments like, "They are good in methodology, but when it comes to mastery of content, they are normally poor." Such statements were discussed in the institute.

In the Teacher Education Board Meeting (23rd TEB Meeting) in May 2003, a number of sharp questions were raised with regard to the quality of training received by the teachers during the pre-service course.

In 2001, the NIE, Paro, conducted a small but very informative study on the past teacher graduates of the two NIEs (Samtse and Paro). The study indicated that for the most part initial teachers had high enthusiasm and did "*very well*" in the school, but by the third year, their enthusiasm slowed down and their roles were not as much as they used to be (PITT, 2001).

Dr. Jagar Dorji's study on the change of curriculum and its implementation from 1997 to 2000 also indicated that teachers did not make much sense of the new change introduced (Dorji, 2000).

Early in 2003, the Swiss Development Cooperation and HELVETAS offered to support our endeavour to improve the pre-service teacher education programme. One of the first things that arose during the discussions was the effectiveness of the pre-service teacher-training programme in the National Institutes of Education.

During the 13th general Staff Meeting held on 27th May 2003, many felt the need to conduct a "Tracer Study" on the 1st batch of B. Ed graduates from the NIE, Paro. Although, the Institute also trains PTC and ZTC teacher trainees, the house felt that it is more profitable to do a research on the B.Ed graduates since the facility of training of PTC and ZTC will be phased out permanently in December 2003.

The Problem

From the above arguments, two pertinent questions clearly surface:

i) What are the problems that our initial teachers face?
ii) What can the NIEs do to make a stronger link between the teacher education programmes and the school needs?

The problems, of course, could be in any area: English, Dzongkha, Mathematics, Science, History, Geography, Environmental Studies, Social Studies or other professional subjects.

However, English is given the first preference since the 1st B.Ed graduates from NIE, Paro, are mostly trained to become English teachers.

Purpose of the Research

This research has three purposes:

a. To study the match between the needs of the schools and the programme objectives at the NIEs in the teacher training.
b. To study the kinds of problems faced by the initial teacher graduates in the schools.
c. To make a strong link between the pre-service teacher-training programmes and the field reality.

Research Strategy

The questions I have posed earlier call for a strategy that will not only provide a quantitative analysis of the data, but also produce a general view of all the participants in the study. This leads to the need of interviews and observations of participants (i.e. the teacher graduates) and interviews with the heads of the schools. A survey questionnaire that represents the views of the participants on the performance and quality of the teacher graduates and the pre-service teacher education invites the use of quantitative method. It is hoped that a triangulation of the different types of data would grant the data the reliability that it needs.

Participants

Teacher graduates belong to two strands: one is B. Ed Secondary who teach in secondary level while the other is B. Ed Primary strand who teach in the primary level. The selection of participants of this study will be based on where the new teacher graduates from 2002 are deployed.

The reason for selecting 2002 is that NIE Paro had sent out its first B. Ed batch in that year and they have started working in the schools since July 2002. The participants will also include the head teachers and other English teachers in the same school where our graduates have been teaching.

There are course modules in the NIEs to study. The schools would have minutes of the meetings of the teacher education board, and other relevant documents wherever possible. These documents will be studied. Lesson plans, students' notes and home works will also be included in the review.

Time Schedule

The New Year (2004) brings in new challenges along with the launching of the STEP project. Along with this, the review of the pre-service teacher education is necessary.

Before the review of the curriculum, it is necessary to understand the needs of the field as well as how the teacher graduates are doing after leaving the course. The result of this study will therefore be very crucial in providing a direction to the new ventures in line during 2004.

The Tracer Study on B. Ed Graduates of July 2002

In the move to trace how many graduates are deployed in which d*zongkhags*, I tried to keep a record of the number. For clarity, the number is subdivided into male and female as shown in the graph given below:

The Tracer Study on the first batch of B. Ed graduates of NIE Paro who graduated in July 2002:

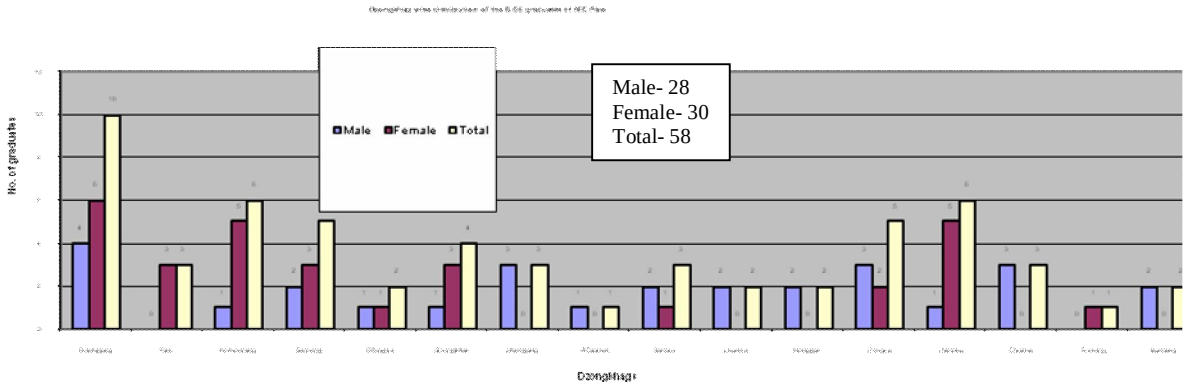

fig.1

Conclusion

1. Except for Dagana, Gasa, Punakha and Haa *dzongkhags*, the B. Ed graduates of July 2002 are deployed in various schools in sixteen *dzongkhags* across the country.
2. Ten of them are in Trashigang *dzongkhag* alone.

During the research, it wasn't possible to visit all the graduates in all the d*zongkhags* for want of time. However, the schools which were visited are reflected in the graph given below:

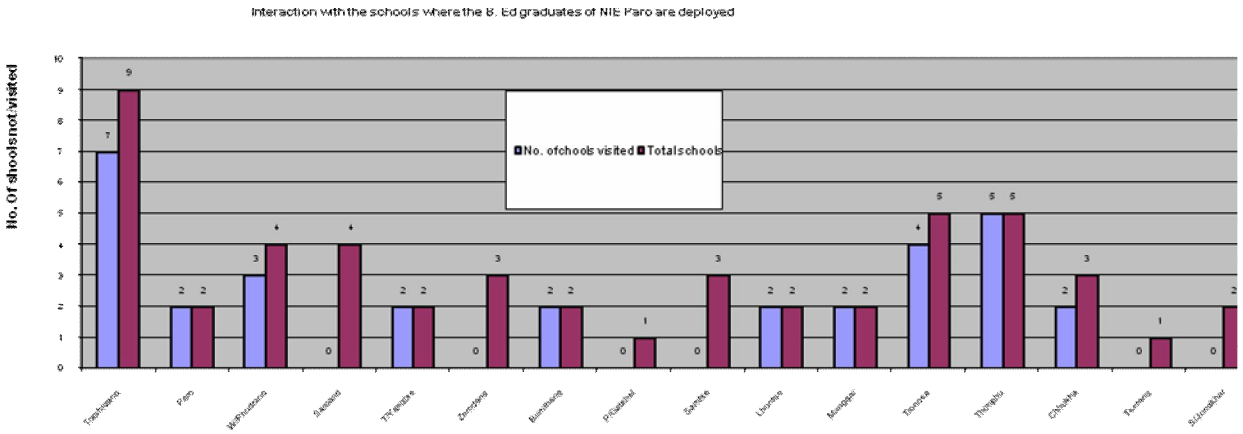

fig.2

Conclusion

1. The graph above indicates that out of 50 schools in sixteen *dzongkhags*, 31 schools have been visited during the Tracer Study tour.
2. 12 schools in five *dzongkhags* i.e. Pema Gatshel, Zhemgang, Samtse, Samdrup Jongkhar and Tsirang have not been visited.
3. An aggregate of 35 graduates (60.3%) were personally interviewed (including the Dzo. B. Eds).

While it is important to find out in which *dzongkhags* the graduates are deployed, it is equally important to find out how they are deployed within the d*zongkhags.* Are they placed in the urban, semi-urban, rural, or remote schools? The graph given below indicates the distribution of the graduates in terms on urban, semi-urban, rural and remote settings within the given d*zongkhags*:

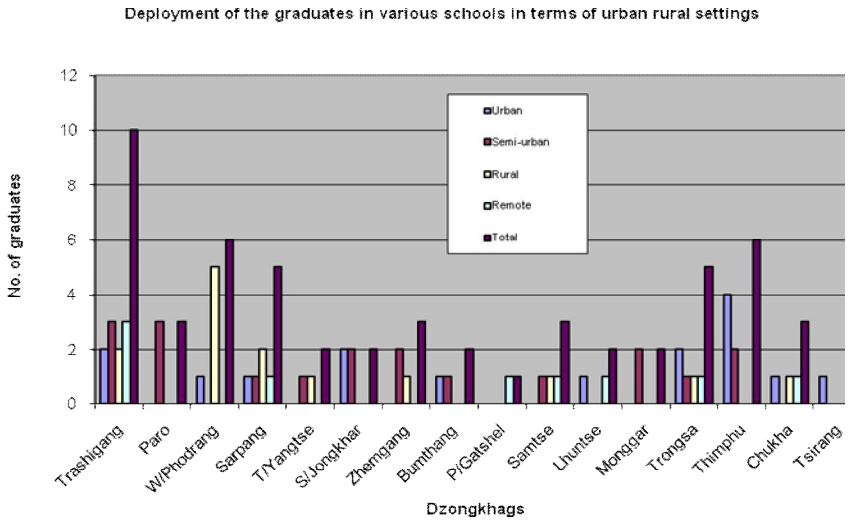

fig. 3

Discussion

16 of the graduates are deployed in the urban schools which is about 27.5% of the total 58 graduates. The semi-urban schools account to deploying 32.7% (19 graduates). The figure is much higher than the number of graduates deployed in the rural schools (24.1%) and the remote schools (15.5%).

Conclusion

More graduates are deployed in the urban and semi-urban schools than in the rural and remote schools. Some remote schools desperately need better qualified teachers and if the current trend of deploying more graduates to the urban and semi-urban schools continues, the rural and remote schools would suffer a great deal.

The graph given below is the part of *fig. 3* and it shows the actual schools with which I had the interaction:

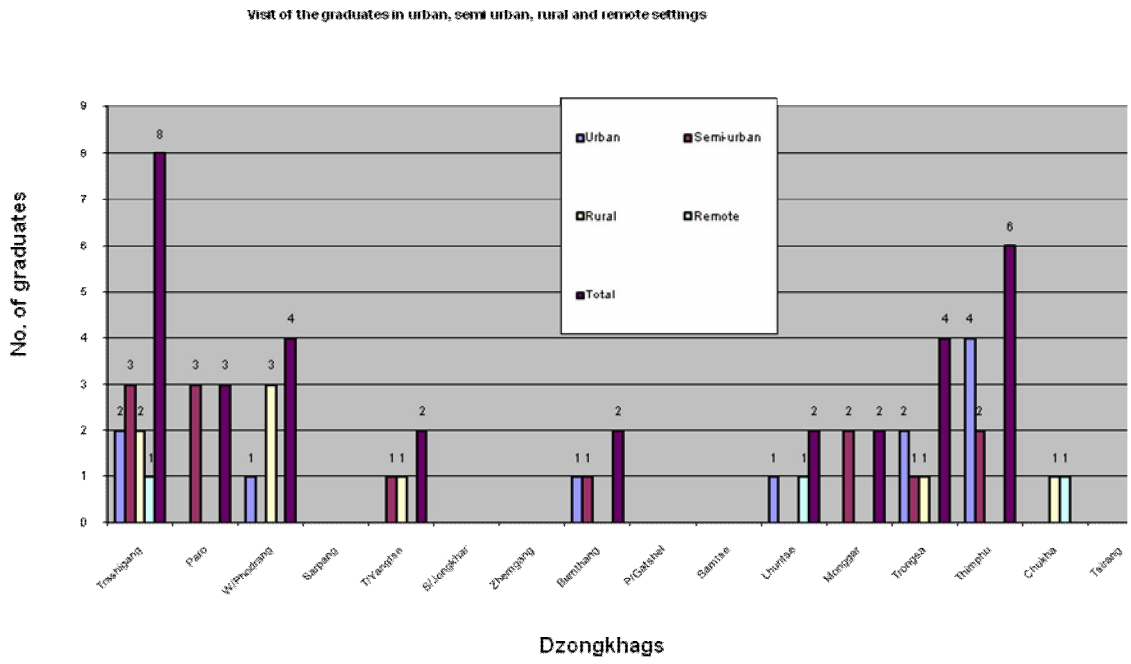

fig. 4

Discussion

1. No. of graduates visited in the urban schools – 11 (18.9% of 27.5%)
2. No. of graduates visited in the semi-urban schools – 13 (22.4% of 32.7%)
3. No. of graduates visited in the rural schools – 8 (13.7% of 24.1%)
4. No. of graduates visited in the remote schools – 3 (5.1% of 15.5%)
5. Grand total of the graduates visited during the Tracer Study tour- 35 (60.3%)
6. Of the thirty-five graduates visited, five are B. Ed (Dzo) graduates. (8.6%)

Conclusion

In varying proportions, all the four types of schools (i.e. urban, semi-urban, rural, remote) were covered during the research covering more than 60% of the graduates. However, no school under Zhemgang, Pema Gatshel, Sarpang, Tserang, Samtse and Samdrup Jongkhar *dzongkhags* could be visited due to security reasons.

Two strands of B. Ed graduates graduated from the Institute in July 2002: B. Ed (Primary) English and B. Ed (Primary) Dzongkha. The graph given below shows the *dzongkhag*-wise distribution of the two strands of graduates:

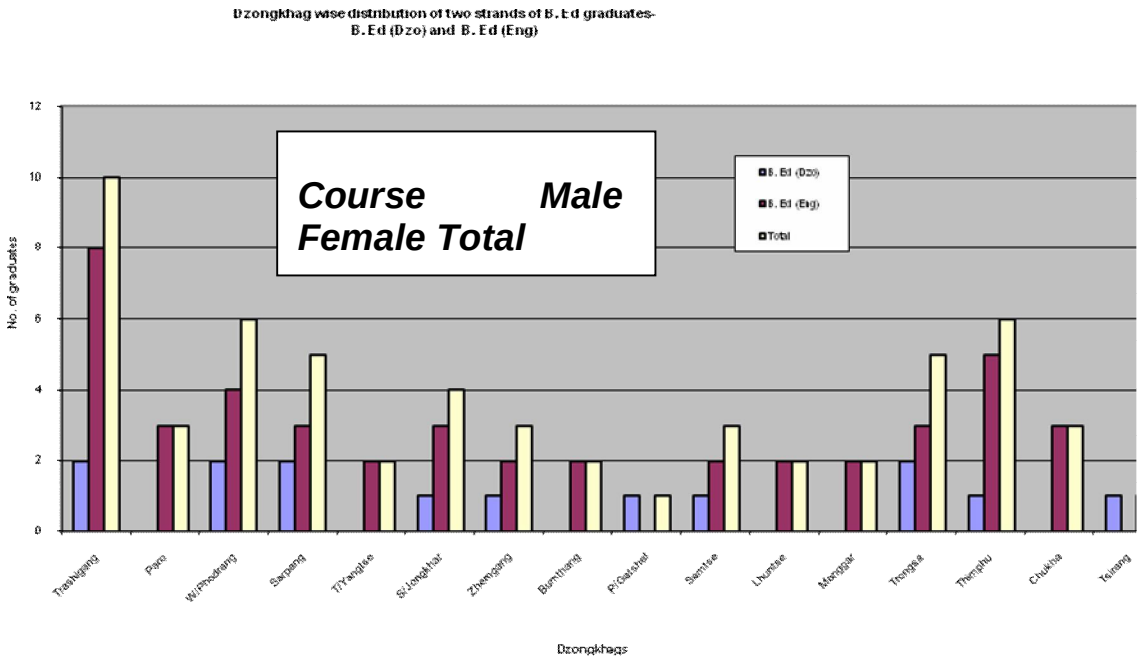

fig. 5

Conclusion

1. Currently, there are 14 B. Ed (Dzo) graduates in 10 d*zongkhags*, and 44 B. Ed (Eng) graduates in 14 d*zongkhags*.
2. No B. Ed (Dzo) graduates are deployed in Paro, Trashi Yangtse, Bumthang, Lhuntse, Monggar or in Chukha d*zongkhag.*
3. No B. Ed (Eng) graduates are deployed in Tsirang and Pema Gatshel d*zongkhags.*

While tracing "what level the graduates taught in the schools", the findings also pointed out the ratio of deployment of B. Ed graduates in Primary Schools, Lower Secondary Schools and the Middle Secondary Schools. The graph given below categorically indicates the ratio of deployment of female and male graduates in various types of schools:

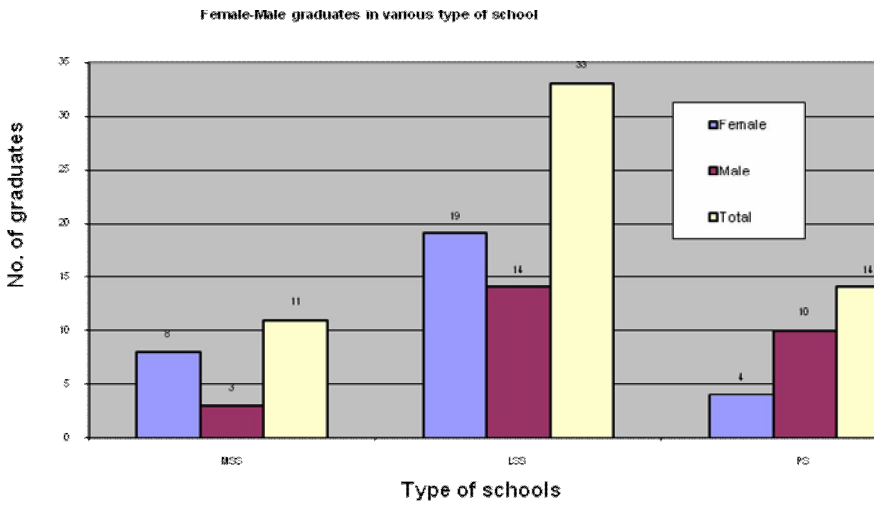

fig. 6

Discussion

Nearly 20% of the 1st batch of B. Ed graduates from the NIE, Paro, are deployed in the Middle Secondary Schools while more that 50% are in the Lower Secondary Schools. Only 24.1% of the graduates are deployed in the Primary Schools. Given the fact that out of 58 graduates, 28 are males and the rest 30 females, it is quite interesting to note that fewer female graduates are deployed (13.3%) in the Primary Schools than male graduates (35.7%). However, there is a visible increase of deployment of female graduates in the Lower Secondary and Middle Secondary Schools.

Conclusion

The first batch of B. Ed graduates from the NIE, Paro, belong to the Primary strand and their deployment in the Middle Secondary Schools is a matter of concern. Even in the Lower Secondary Schools without the primary section, this would be a matter of concern.

(The following data is gathered only from the B. Ed (Eng) graduates).

The graph given below is the detailed diagram of *fig. 6* and it indicates the number of graduates who specialise in teaching from Lower Primary Classes to Middle Secondary Classes.

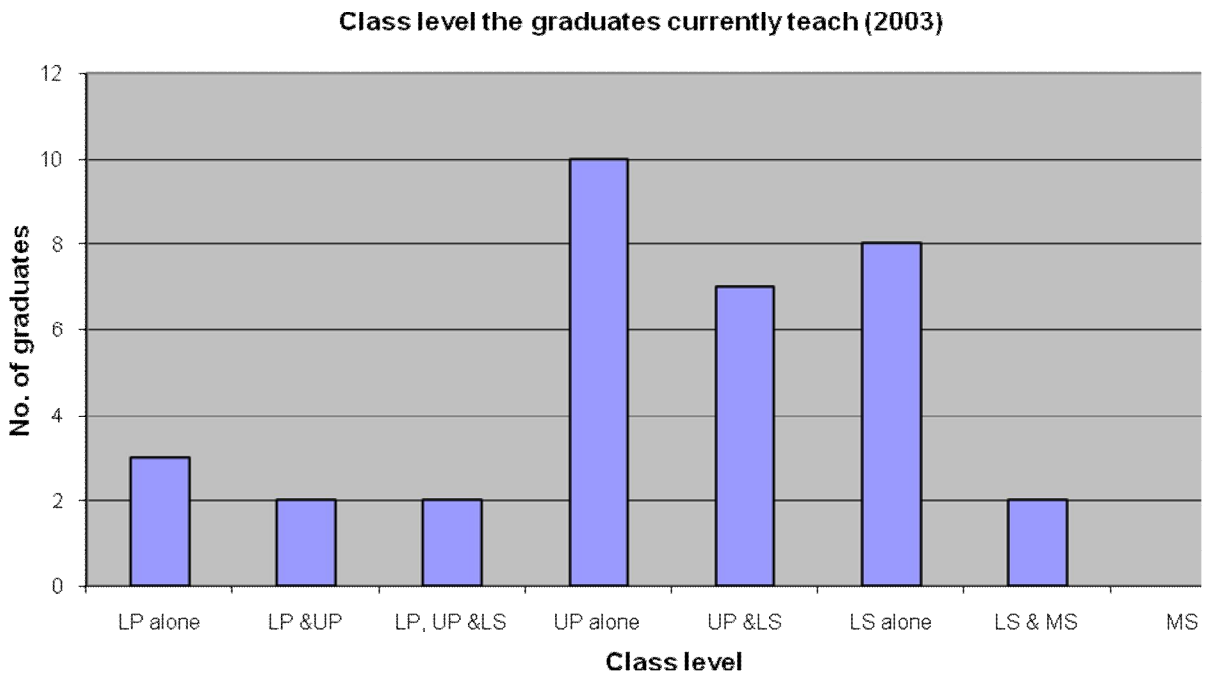

fig. 7

Key-

LP- Lower Primary classes
UP- Upper Primary classes
LS- Lower Secondary classes
MS- Middle Secondary classes

Discussion

Around 30% of the 34 graduates specialise in teaching in the upper primary classes alone where as only about 5% of them teach in lower primary as well as in upper primary classes. Although no graduates teach exclusively in middle secondary classes, 23.5% of them teach in the lower secondary classes. This trend, as discussed before, is a point worthy to be reckoned with. Why do majority of the graduates teach in the upper primary and lower secondary classes when they are trained to teach lower primary classes as well?

Conclusion

More B. Ed graduates teach in upper primary and lower secondary classes than they do in the lower primary classes or middle secondary classrooms. Why they do not teach in the Lower Primary classes is a matter of concern.
“Do you think the B. Ed graduates from NIE, Paro, are confident to teach English? If ‘Yes’, till what grade do you think they are confident to teach English?” The graph given below partly answers the question as well as tells the opinion on the standard of English with the B. Ed (Eng) graduates in terms of class level.

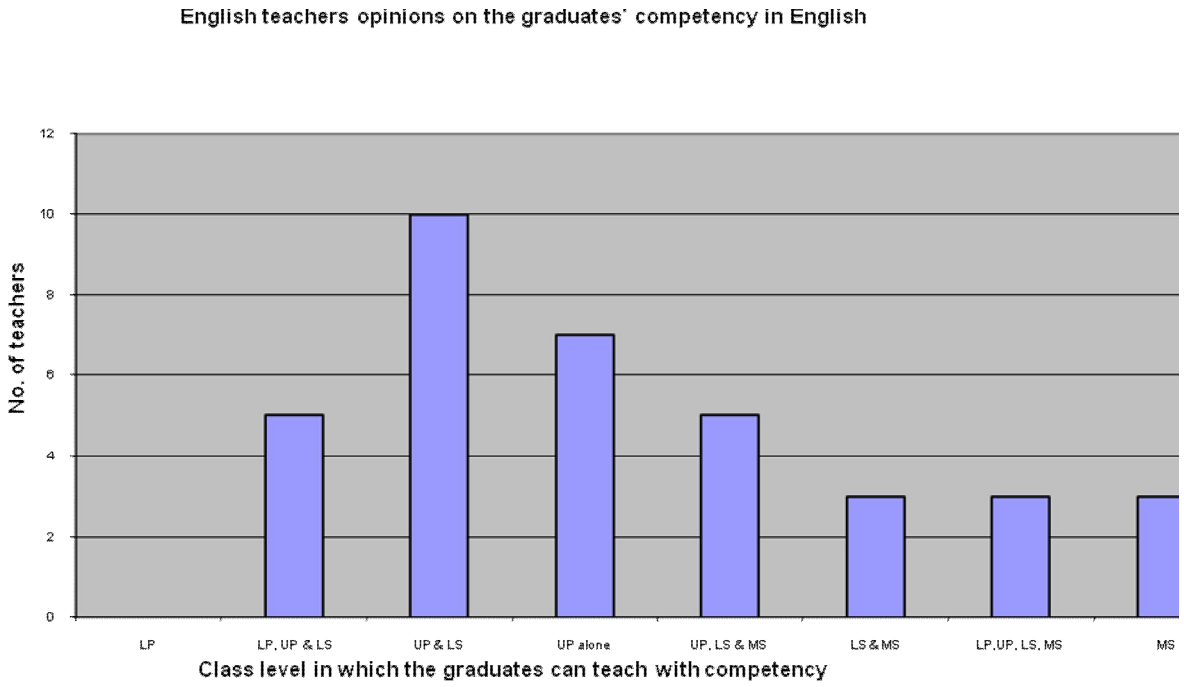

fig. 8

Discussion

About 23% of the English teachers say that the B. Ed graduates can teach in the upper primary and lower secondary classes. Interestingly, despite the three years of training in the Institute, none of the 44 English teachers interviewed feel that the graduates from NIE, Paro, are competent enough to handle the lower primary classes. However, a little over 6% of them say that the graduates can teach in the middle secondary classes.

Conclusion

Since no English teacher is confident of B. Ed graduates from NIE, Paro, in terms of teaching in the lower primary classes, the way the methodology module is offered in the Institute has to be critically reviewed and improved upon.

"What other subjects do you teach besides English?" The graph given below indicates what subjects the graduates actually taught apart from English in 2003.

Subjects the English graduates teach besides English

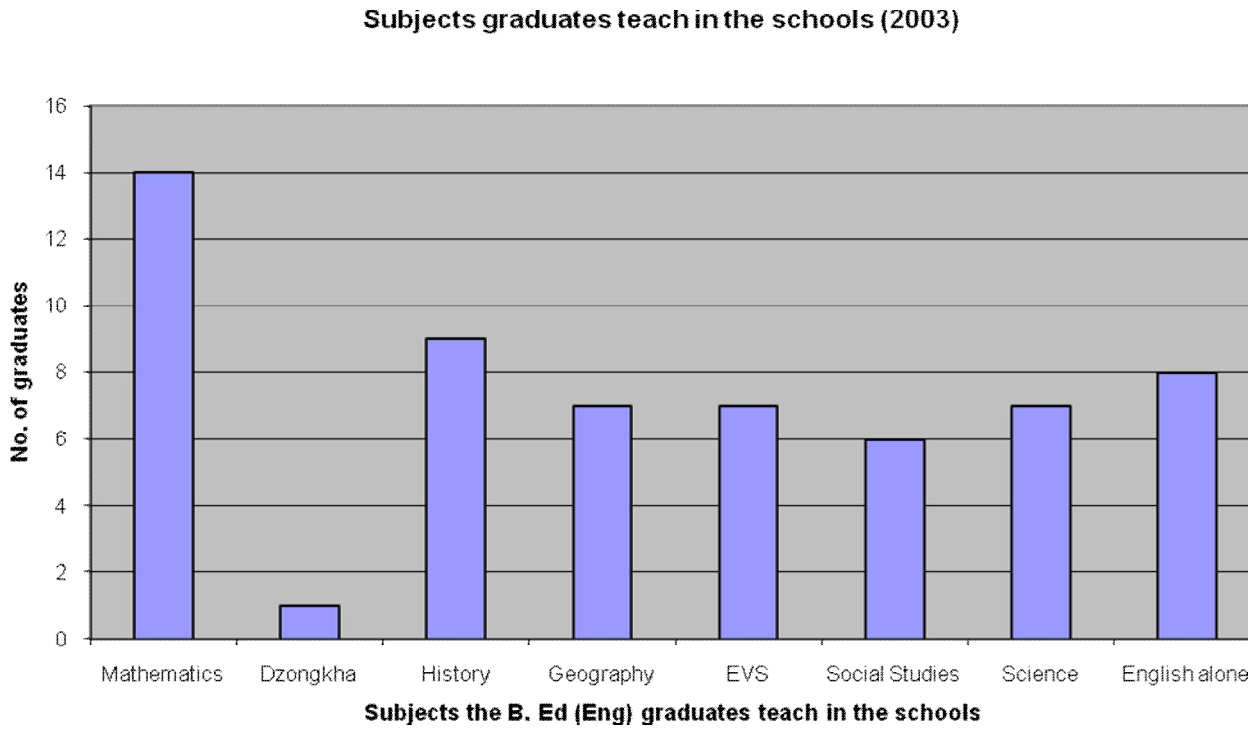

fig. 9

Conclusion

1. 41.1% teach Mathematics besides English.
2. 2.9% teach Dzongkha besides English.
3. 26.4% teach History besides English.
4. 20.5% teach Geography, EVS and Science besides English.
5. 23.5% teach English alone.

Note

i. Of these subjects, 20.5% teach three subjects or more besides English.
ii. 2.3% teach any other two subjects besides English.
iii. Almost all of them have three or more responsibilities to handle besides their normal teaching in the classes.
iv. As per the reports of the head teachers and the English teachers, almost all of the graduates are doing very well in their duties.

The graph given below indicates the opinion of other English teachers on what subjects the B. Ed graduates can actually teach besides English:

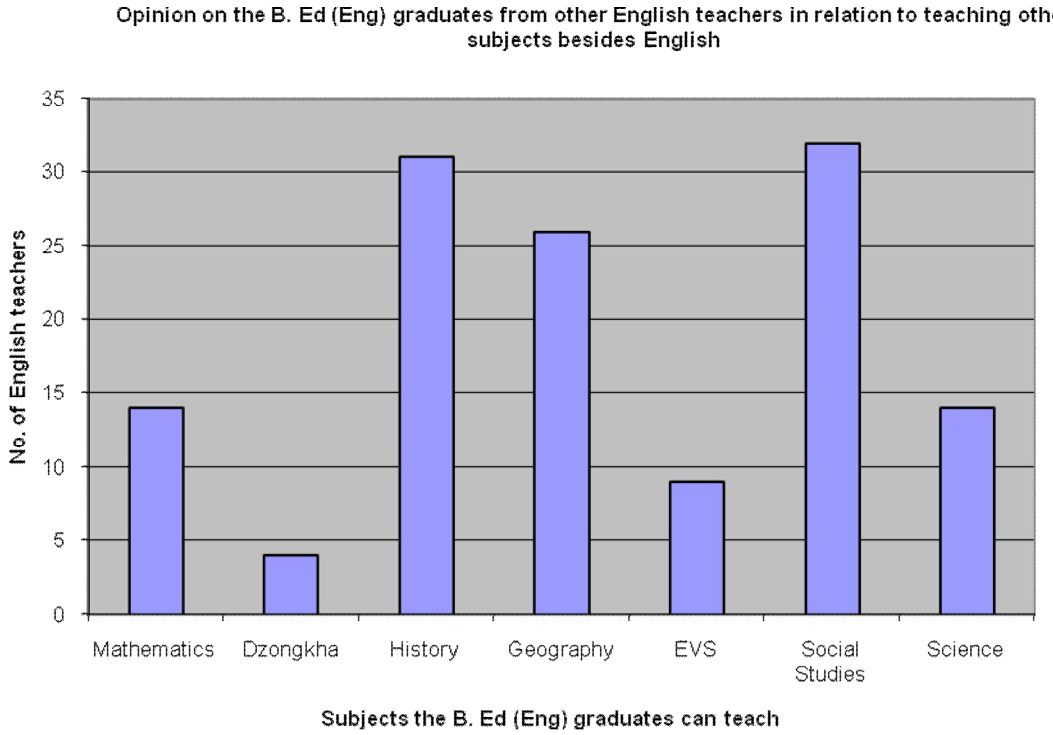

fig. 10

Discussion

The majority of the English teachers (44 English teachers) feel that B. Ed graduates from the Institute can teach Social Studies (72.2%), History (70.2%) and Geography (59%) at the Primary and Lower Secondary Schools. However, when it comes to Science, EVS (20.5% say the graduates can teach the EVS) and Dzongkha (only 2.9% of the teachers feel that the graduates can teach Dzongkha), the majority of them have their reservations.

Conclusions

While the number of sessions offered in the Institute is the same, the study indicates that majority of the English teachers have confidence in the B. Ed graduates in terms of their teaching of History, Social Studies and Geography besides English in contrast to their reservations in teaching of EVS and Dzongkha.

"Do you share the view that you are strong in 'methodology but weak in content'? If 'Yes', what areas of the content are you weak in?" The graph given below indicates the areas in which the graduates confess they are weak in:

Areas of content the B. Ed (Eng) graduates say they are weak in:

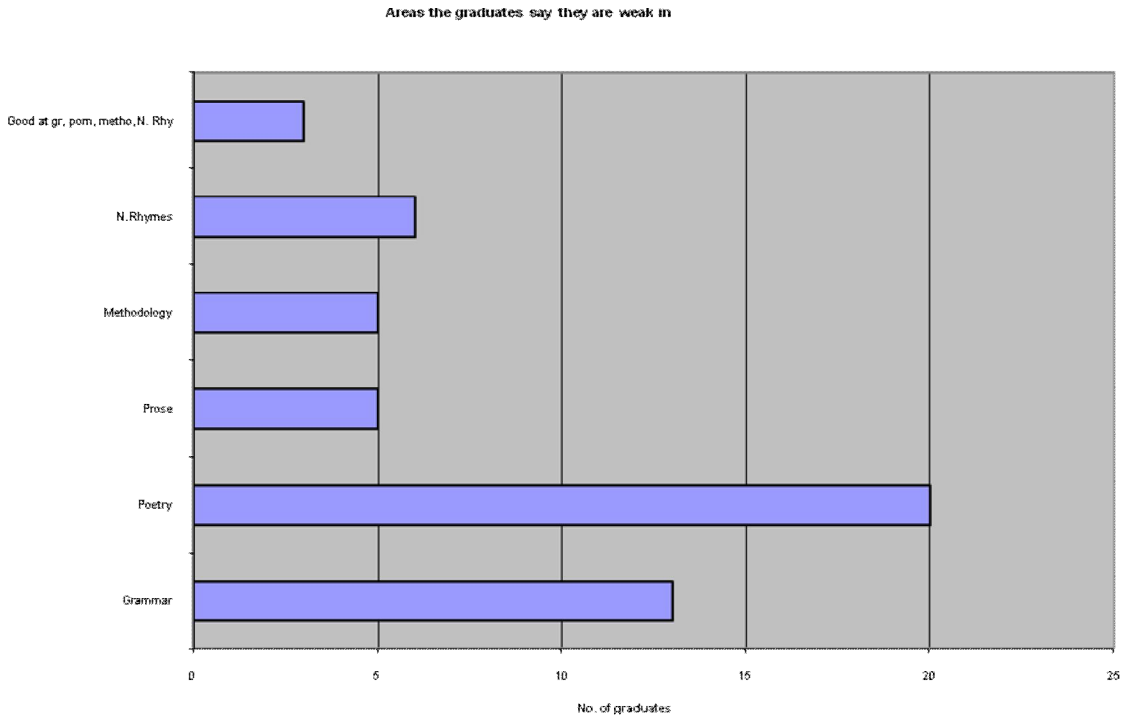

fig. 11

Discussion

About 60% of the 34 graduates interviewed say that they are weak in teaching of poetry followed by nearly 40% of them stating that they are weak in grammar. Less than 10% of them say that they have no difficulty in handling poetry, grammar, prose or methodology. This is an alarming figure given the fact that all of them have to teach English at one level or the other at one point of their career.

Conclusion

The majority of the 1st batch of B. Ed graduates from NIE, Paro, are weak in teaching Poetry and Grammar and a smaller number poor in teaching nursery rhymes (17.6% of the 34 graduates).

The following graph supplements the *fig. 11* as the data is gathered from head teachers of the concerned graduates:

Areas of content the head teachers say the B. Ed (Eng) graduates are weak in:

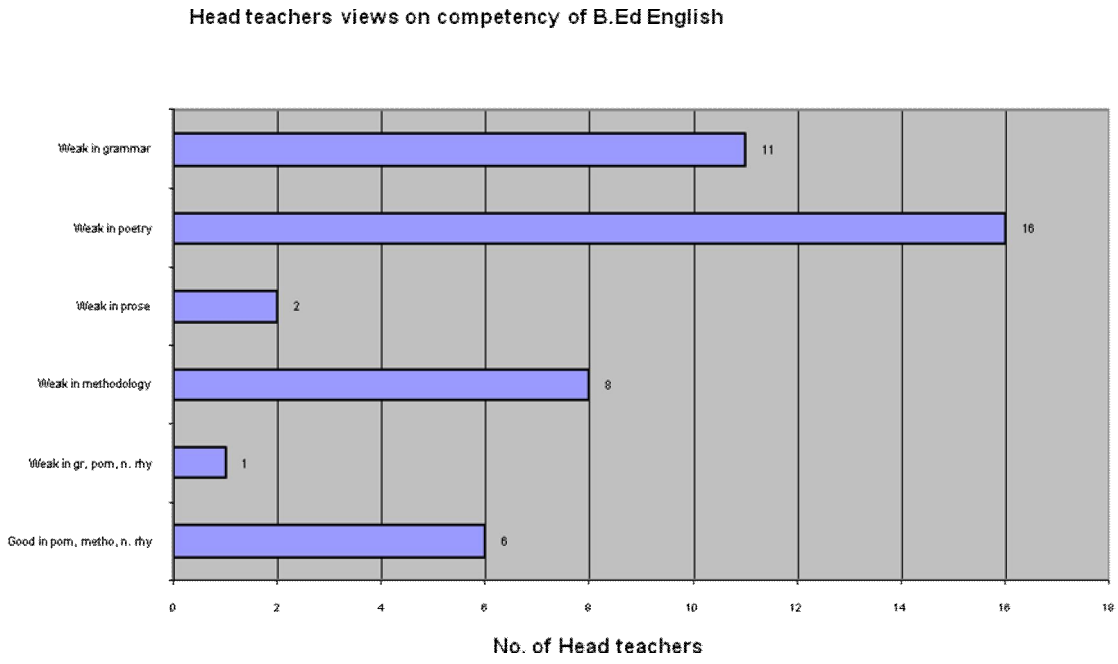

fig. 12

Discussion

Although 18.7% of the 32 head teachers say that the B. Ed graduates are competent in all the areas of teaching, 50% of them agree that the graduates are incompetent in teaching of poetry and nearly 35% say that they are poor in teaching of grammar. Another 25% of the head teachers say that the graduates are not competent to handle the lower primary classes. This finding agrees with the graduates' candid answers that they are weak in poetry, grammar and methodological ideas in the lower primary classrooms. This is a matter of concern since the image of the Institute is at stake.

Conclusion

The majority of the head teachers has less confidence in the 1st batch of B. Ed graduates from the NIE, Paro, when it comes to teaching of poetry and grammar to the students.

This graph too supports the *fig.11 (*the areas which the graduates are weak in) since the same question was asked to the graduates, head teachers and the English teachers.

Areas of content other English teachers say the B. Ed (Eng) graduates are weak in:

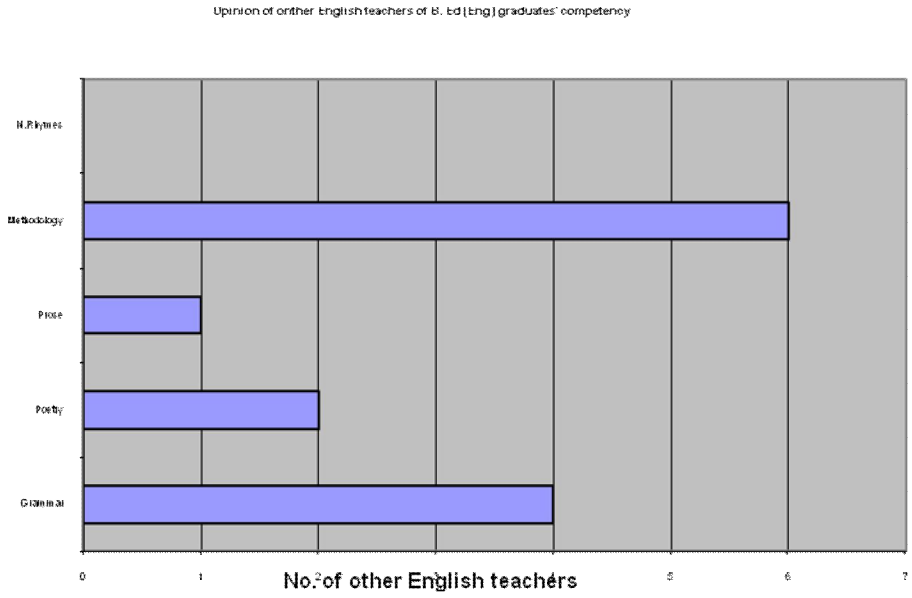

fig. 13

Discussion

Contrary to other findings, *fig. 13* shows that the graduates are weak in ***Methodology***. It is crucial to note that *methodology* here implies the 'methodologies' applied in the lower primary classes and not in the upper primary, lower secondary or middle secondary classes. Although the majority of the English teachers are PTC graduates, even they agree that the B. Ed graduates are weak in teaching poetry and grammar.

Conclusion

The majority of the English teachers has the opinion that the B. Ed graduates are not so good in teaching in the lower primary classes, besides, their being weak in teaching grammar and poetry.

"Does the teacher training that you underwent in the NIE help you as an English teacher? If 'Yes', what areas does it help you in?" The graph given below explicitly indicates what areas are more relevant than the rest:

Relevance of the pre-service teacher training in relation to the schools:

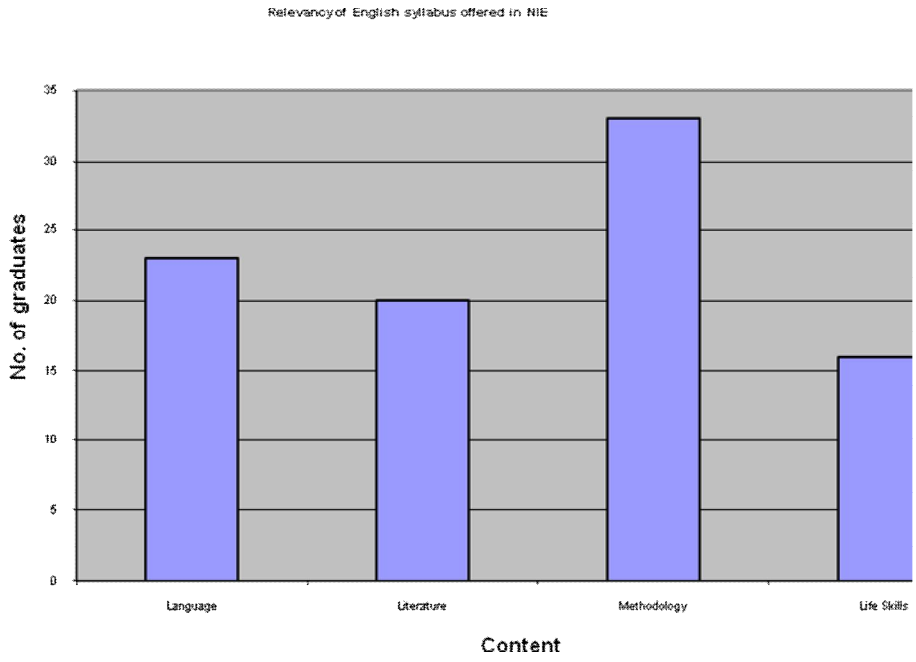

fig. 14

Discussion

Almost all the graduates (97.05%) say that methodological ideas offered in the Institute is relevant. Although 58.8% say that literature offered in the Institute is useful in the field, given the fact that most of the comments came from the teachers who did not teach literature in the field, this data has to be reconsidered (This is essential because those who teach literature in the Middle Secondary Schools feel otherwise). Nearly 70% of them say that language modules offered in the Institute is relevant.

Conclusion

The Modules in literature in the Institute have to be reviewed and replaced with suitable modules befitting the school syllabi in the field. It is imperative as they have to confidently teach literature in the classrooms and the learning here in the Institute would orient them to the English literature taught in the schools.

"In Teaching English, how useful is the module ***The Study of Language*** in the school?" The responses from the graduates in relation to the question are represented in the graph given below:

Relevance of the module *The Study of Language* in the schools:

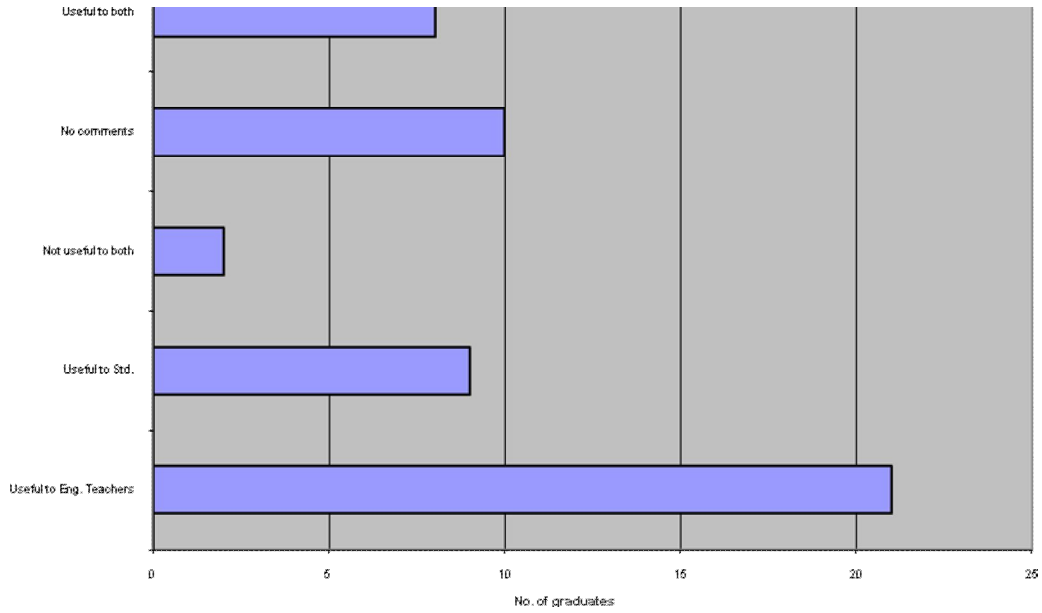

fig. 15

Discussion

Nearly 50% of the graduates find ***The Study of Language*** relevant to the teachers in the school. About 20% say that the module is useful for the students as well as for the teachers. It is quite interesting to note that 22.7% of the graduates have no comments since they have forgotten what they have learnt in the module. 4.5% say that the module is not relevant to both the teachers and the students. The graduates have been in the field only a little more than a year and if they have already forgotten what was learnt in the about a year ago, and another 4.5% say that it is not relevant in the field, the way the module is offered in the Institute needs reviewing.

Conclusion

It is heartening to find out that nearly 50% of the graduates feel that the module is relevant for the teachers. However, nearly 30% of the graduates have either forgotten what they have learnt in ***The Study of Language*** sessions or find it useless in the schools. Although the number is relatively small, it is worth reviewing the module and find out the ways of improving it.

Some of the hurdles the NIE graduates initially face in the schools:

1. Teaching poetry and teaching of grammatical structures prove very difficult.
2. Lack of proper grammar reference books, inadequate information on certain topics' shortage of time to prepare teaching learning materials add to the frustrations in the smooth teaching of a lesson.
3. Teaching EVS is difficult due to our own weakness in Dzongkha spellings.
4. Self-discovery learning activities are not familiar with the students. As such, the teacher has to explain everything all over again and that takes away a huge chunk of our time.
5. Unavailability of cassettes to teach nursery rhymes in the schools.
6. Lack of support from the head teacher makes the matters worse.
7. Getting used to the school environment/syllabi (using teacher's manual and English textbooks simultaneously, topics etc) all require time.
8. CA/ongoing evaluation, preparation of examination results, preparation of blueprint in English paper, correction works consume a lot of time and it poses a challenge.

"Did you overcome the initial problems that you faced in the schools? 'Yes', 'No' 'Yes & No'.

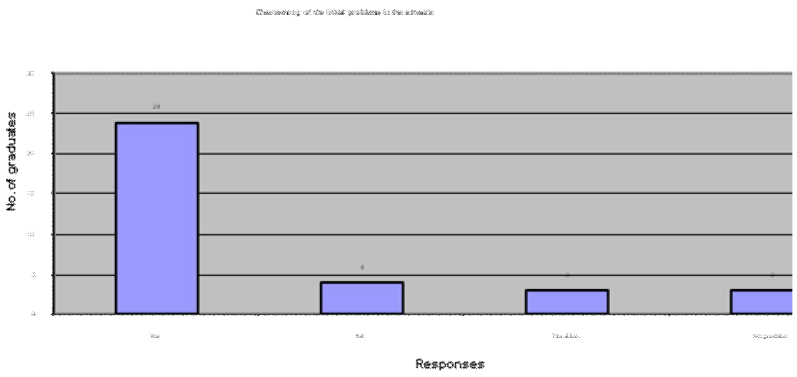

fig. 16

Discussion

Almost all the fresh graduates from the Institute initially faced some problems in their schools and given the support from the head teachers and the colleagues, the majority of them could overcome the problems (70.5% of the 34 graduates overcame the initial problems). A small percentage of 11.8% could not solve the initial problems and 8.8% could partially solve the problems.

Conclusion

The majority of the graduates overcame the initial problems with the support from the schools and with their own hard work and dint of ability.

How some of the problems were solved:

1. Seeking help from the colleagues and discussing in the SBIP meetings.
2. Referring to the personal grammar books and downloading from the Internet.
3. Getting down to the children's level.
4. Analysing the nature of life.
5. Giving children more opportunities to speak in English.
6. Referring to the notes that were written in the NIE, Paro.

Reasons why some problems could not be solved:

1. The classrooms are too overcrowded to carry out meaningful activities.
2. No guide on the prescribed poems and limited information on the poet.
3. Inadequate grammar books for the students.
4. The school does not have the required reference books.
5. Some head teachers have no respect for the fresh teacher's views.
6. Some children keep on shying away no matter how hard the teacher tres to befriend them.
7. While 88% of the graduates say that the school authorities render professional support, the rest 11.76% admit that they do not get enough support from the head.

Since the majority of the head teachers said that they render professional support, I asked them in what ways they help the graduates and they reported that they give access to the library and reference books, discuss their concern in the SBIP meetings and support the literary contests when organised. The graph given below indicates frequency of SBIP meetings held in the academic year of 2003:

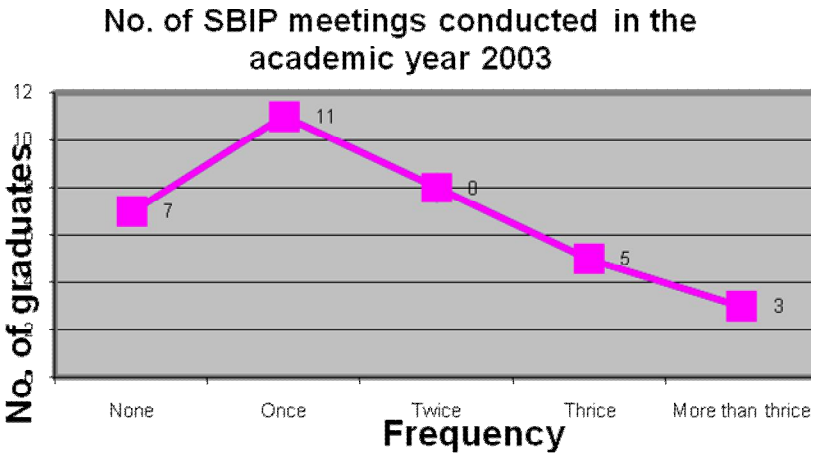

fig. 17

Discussions

Of the 32 schools, 32% of the schools at least conducted SBIP meetings once in the academic year of 2003 and another 23.5% and 14.7% conducted twice and thrice

respectively. Another 8.8% conducted it more than thrice. In these meetings, some of the problems pertaining to English were also discussed and solved. Interestingly, 20.5% of the schools, admitted that they did not conduct a single SBIP meeting in the entire academic year of 2003.

Conclusion

About 80% of the schools have conducted the SBIP meetings once or more than once. The majority of the graduates who were placed in the schools which had the SBIP meetings were able to solve their initial problems in contrast to those which did not conduct any SBIP meetings.

Given below are some of the topics the SBIP meetings discussed pertaining to English:

1. Proverbs and Idioms.
2. Dictionary skills and language.
3. The common errors in English such as tenses, pronunciation and grammatical errors.
4. Library usage and how to improve reading.
5. Some of the ways of making children read other books besides the prescribed textbooks.
6. How to help children to write better and conducting literary activities.
7. How to improve the speaking skills of children.
8. Inadequacy of content knowledge in poetry.

All the 34 graduates interviewed said that they seek professional support from their colleagues when they are doubtful of a particular topic. The frequency of how often they seek help is shown in the graph below:

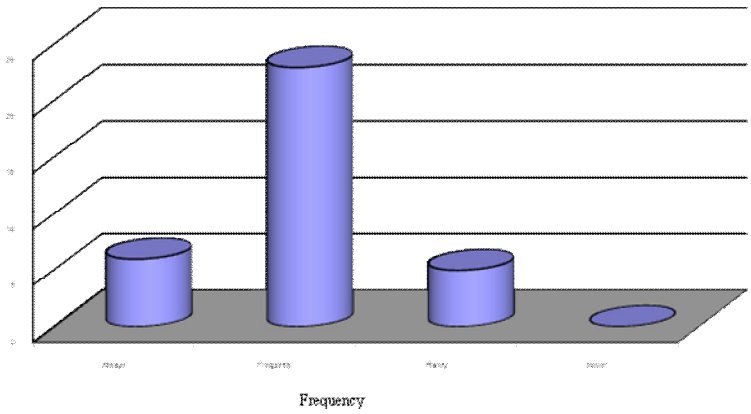

fig. 18

Discussion

17.6% of the 34 graduates always seek help from their professional colleagues. And another 67.6% frequently seek professional support from their colleagues when they

are in doubt of the particular topic. How ever, 14.7% rarely seek support from their friends. In short, the majority seeks help from their friends at one time or the other.

Conclusion

The majority of the fresh B. Ed graduates from NIE Paro seeks professional support from their colleagues when they are in doubt of a certain topic.
All the B. Ed alumni in the schools expect professional support from the NIE, the type of which is shown below:

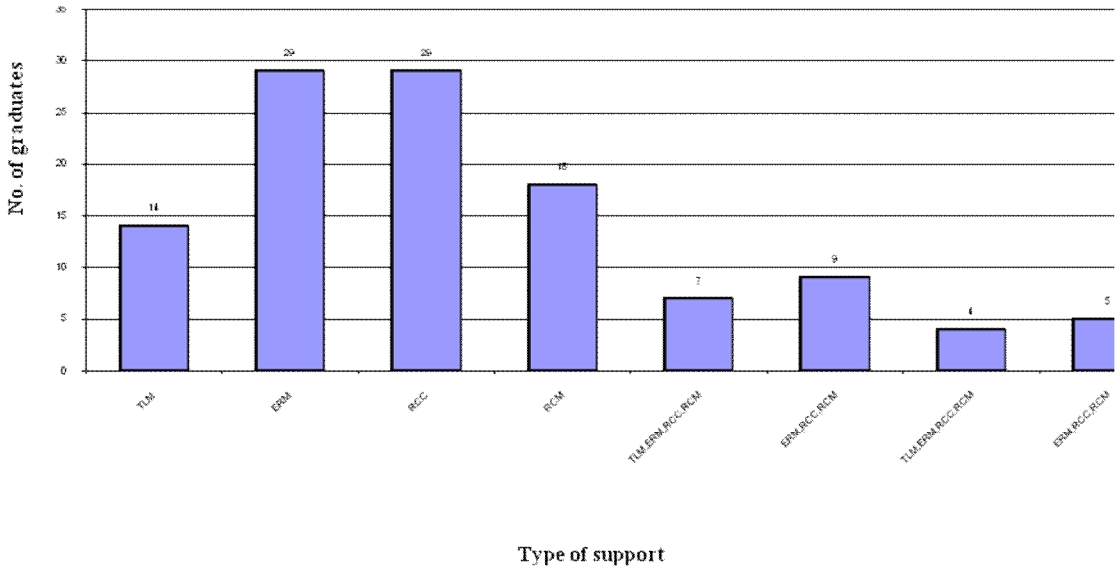

fig. 19

Key

1. *TLM- In providing Teaching Learning Materials.*
2. *ERM- In providing English Reference Materials.*
3. *RCC- In providing Refresher Course in Content.*
4. *RCM- In providing Refresher Course in Methodology.*

Discussion

Till date, there is no system of the Institute (NIE, Paro) rendering professional support to its alumni, be it PTC, ZTC or B. Ed graduates. However, while trying to find out what type of help they might need in the school if the Institute decides to render some support, an overwhelming 85.2% say that they need the Institute's support in terms of providing them refresher courses in content and English reference materials. More than 25% expect the Institute to equip their schools with teaching-learning materials and give them opportunities to attend seminars and workshops in English content as well as in methodology.

Conclusion

Given the fact that all of them are novices to the profession and the majority of them have to work in the schools with minimum amenities, it is worth considering their plea. Besides, the graduates anticipate some kind of professional support from the parent institute as a matter of a necessity rather than an obligation.

When asked as to which time of the year they like the help to be provided to them, they said that any time as long as the help is provided to them. Specifically, majority of them prefers in the beginning of the year or during the winter break as shown in the graph given below:

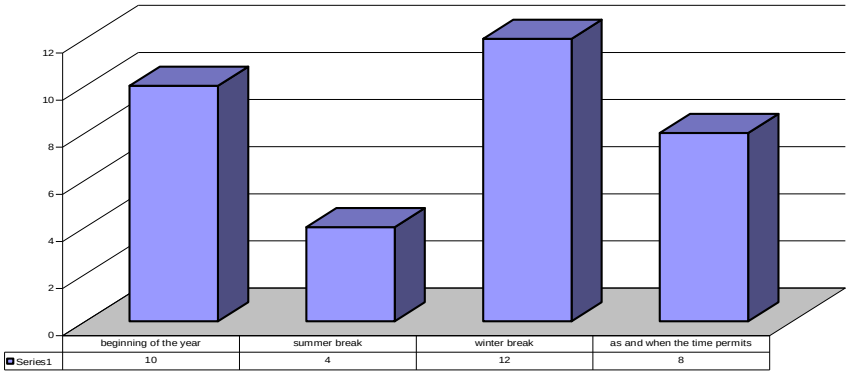

fig. 20

Conclusion

Given the choice, the majority of the graduates prefer the help to be provided to them during the winter break (35.3%) or in the beginning of the year (29.4%). 23.5% says that that the help could be provided to them as and when the time permits. However, if the help was to be provided during the summer break, only 11.7% support the idea.

When asked as to how the Institute should help them, the majority of them wanted the Institute to conduct workshops and seminars. Only a few wanted to come to the institute and clarify doubts for themselves. The details are shown on the graph below:

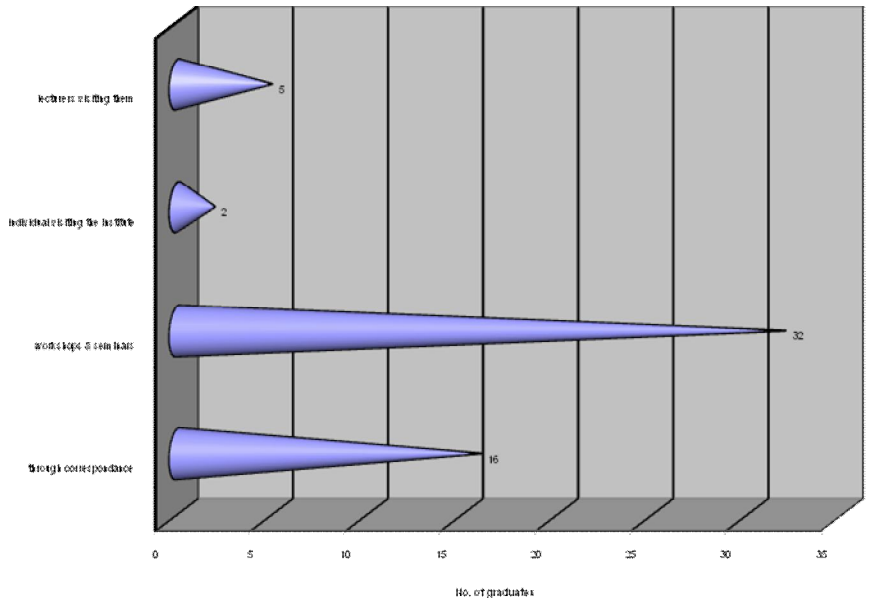

fig. 21

Discussion

While the majority of the 94% of the graduates like the NIE to conduct workshops and seminars during the winter breaks, nearly 50% would like to get some help through correspondence. Only 5.8% liked to physically come to the NIE and seek professional support. 14.7% of them say that any kind of support would do them good.

Conclusion

Since the graduates' physical presence in the Institute is not feasible to the majority of them, the Institute has to think of other alternatives such as conducting workshops, seminars, establishing a system of correspondence or providing them the reference books.

Suggestions from the head teachers to the Institute:

1. The NIE should study the individual interest of the candidates before they are enrolled as trainees in the institute. They should be willing to work hard once they become teachers.

2. It is high time for the NIE to look for more quality teachers rather than quantity.

3. For a few years, the graduates should remain affiliated with the institute to give them pastoral care during the times of need.

4. NIE should look into the possibilities of offering M. Ed courses to the teachers after the B. Ed. Course.

5. NIE has to develop an assessment scale that will indicate the competency of the NIE graduates before they are sent to the schools.

6. The NIE needs to produce audiovisual cassette both in Dzongkha and English covering all the skills and distribute them to all the schools across the country.

Suggestions from the English teachers to the Institute:

1. While methodology is important, the NIE should make language and content especially grammar as the part of English language course in their training.

2. "We come across children having bright ideas but cannot put them down into words. The trainees should be trained in a way they can bring changes in their children's English usage."

3. **Strengthen their competency in written Dzongkha.**

4. **Whatever is taught to the PTCs must also be taught to the B. Eds to make them competent in teaching the lower primary classes.**

5. **If the visiting lecturer could spend some time in the school and demonstrate some lessons on teaching of poetry, and dialogues.**

Suggestions from the English teachers to the CAPSD:

1. The CAPSD should jointly work out with the NIE in prescribing the grammar textbook in order to have uniformity of content taught throughout the country.

2. More number of NAPE nursery rhymes mentioned in the syllabus need to be issued to the schools.

3. Teachers' manual for English language. Class VI is necessary.

4. Grammar books must be published by CAPSD and the NIE.

5. Need separate grammar books for class V, VI, VII, and VIII.

General Conclusions

As per my observations of some of the classes taught by the graduates, and the report given by the head teachers, the majority of the graduates are doing well in the schools: be it in teaching or shouldering other responsibilities such as House Masters, Class teachers, Cultural In-charges, Wardens, Store In-charges, etc. Admirably, all the graduates have a minimum of three responsibilities to handle besides normal teaching. It is heartening to know that despite remoteness and scanty resources, they are striving to give their best to the school and to the children at large.

As the situation demands, many of the graduates teach two or more than two subjects - History, Geography and Social Studies being the most popular among all

other subjects (Dzongkha and EVS are the least popular subjects among the B. Ed English graduates). They deserve our true appreciation.

But it is also a fact that most of the graduates find teaching of grammar and poetry, not to mention anything of the Shakespearean drama (***The Taming of the Shrew***) an uphill task to handle. This fact provokes us to think beyond mere statistics: why the difficulty especially in grammar, poetry and ***The Taming of the Shrew***? What could have possibly gone wrong with their three years of training in the Institute?

And yet another surprise is in store for the pre-service teacher educators: almost all the B. Ed graduates from the Institute are reported to be incompetent in teaching in the lower primary classes. Ironically, the first batch of the B. Ed graduates from the NIE, Paro, belong to the Primary strand and they are mainly trained to teach in the primary schools! It is interesting to note, however, that more than 50% of the graduates are deployed in the Lower Secondary Schools and another 20% in the Middle Secondary Schools! Only 24.1% teach in the actual primary schools!

The back-up support the graduates expect from the parent Institute is immense: from supplying them with the ready-made teaching-learning materials to reference books to giving them the opportunities to up-grade themselves in the workshops and seminars, NIE has a long way to go towards fulfilling their needs.

Some teachers and head teachers have pointed out the need for proper screening system during the interview for quality teacher output from the institute. They have also pointed out the need for standardization of the grammar syllabus to bring uniformity in teaching in all the schools across the kingdom. Many have voiced their concern over the standard of written Dzongkha with the graduates. In the move to improve their professional know-how, some teachers have even suggested to have the graduates affiliated with the Institute for a year or two.

All of the above mentioned facts speak of one thing: the need for quality teachers in the field.

Recommendations

1. Since the majority of the graduates are weak in teaching of grammar, the NIEs need to include more content-rich grammatical lessons in the Pre-service teacher training programme as well as the strategies to teach these grammatical items.

2. Poetry teaching is another area where the graduates are not very comfortable. It is recommended that the English Department review the poetry curriculum and include poems from the poetry booklet from class VI to X. (NIE Samtse reviews all the topics of all the classes in the B. Ed III year during the second semester.)

3. It is recommended that some of the English literature, especially the 18th century novel and Shakespearean drama offered in the NIE, Paro, need to be reviewed and eventually changed as follows:

3.1 ***Great Expectations*** needs to be replaced by ***The Mayor of Casterbridge*** or ***Tess of the D'Urbervilles*** since ***Great Expectations*** is more of a repetition of what they had already learnt in the schools. Besides, all the three novels belong to the same 18th Century Victorian Age and it add variety to their learning.

The Merchant of Venice needs to be replaced by ***The Taming of the Shrew*** since the 1st batch of B. Ed graduates have less experience of handling weighty Shakespearean literature. Learning of ***The Taming of the Shrew*** in the Institute would give them much needed confidence on their first day in the school.

Waiting for Godot needs to be replaced by ***All My Sons*** since they do not have to deal with ***Waiting for Godot*** or of its kind in the school.

4. Strategies to teach in the lower primary classes must be strengthened in the NIE.

5. ***The Study of Language*** is recommended to be kept unchanged.

6. The NIE should support its B. Ed graduates either by giving access to the reference books, opportunities to attend the workshops and seminars or giving them opportunities to clarify their doubts via correspondence.

7. More stress has to be given to written Dzongkha at the pre-service teacher training level in the NIE.

* * *

Tracer Study on the 1st Batch (2002) of NIE Graduates, Paro

Questionnaire for the head teachers

(Please note: confidentiality shall be maintained)

Date: .....

1. Do you think that the B.Ed graduates from NIE, Paro are competent enough to teach English? Please tick in the boxes given below:

   i) Yes ☐
   ii) No ☐

2. If **'Yes',** what level/s do you think they are competent? Please tick in the boxes given below:

   i) Lower Primary classes ☐
   ii) Upper Primary classes ☐
   iii) Lower Secondary classes ☐
   iv) Middle Secondary classes ☐

3. If **'No'**, what could be some of the factors that cause their incompetence? Please tick in the boxes given below:

   i) Inadequate English reference books ☐
   ii) Other responsibilities to handle* ☐
   iii) Inadequate subject knowledge ☐
   iv) Inadequate methodological ideas in teaching a topic ☐

4. In what areas do you think the graduates of NIE, Paro are the weakest? Please tick in the boxes given below:

   i) Teaching grammar ☐
   ii) Teaching poetry ☐
   iii) Teaching prose ☐
   iv) Methodology ☐

5. What is the general standard of English with the graduates of NIE, Paro? Please tick in the boxes given below:

   i) Very good ☐
   ii) Good ☐
   iii) Average ☐
   iv) Poor ☐

Other responsibilities – warden; matron; house master; club in-charge; librarian; scout master; store-keeper, mess in-charge; cultural co-ordinator.

6. *Do you, as the Head, render professional help when required? Please tick in the boxes given below:*

   i) Yes ☐
   ii) No ☐

7. If 'Yes', what type of professional support do you provide? Please tick in the boxes given below:

   i) Access to the library and the reference books ☐
   ii) Their problems are thrashed out in the SBIP meetings ☐
   iii) Gives support when they conduct literary contests ☐

8. How many SBIP* Meetings have you conducted in the academic year 2003? Please tick in the boxes given below:

   i) None ☐
   ii) Once ☐
   iii) Twice ☐
   iv) Thrice ☐
   v) More than thrice ☐

9. Did you discuss any topic pertaining to English in the meeting? Please tick in the boxes given below:

   i) Yes ☐
   ii) No ☐

10. If **'Yes'**, what topic did you discuss (in the meeting)? Please briefly mention the outcome of this SBIP Meeting on teaching of English.

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11. What professional support would you expect to be given to the graduates of NIE, Paro? Please tick in the boxes given below:

   i) In providing the teaching learning materials ☐
   ii) In providing the English reference materials ☐
   iii) In providing the refresher courses in content ☐
   iv) In providing the refresher courses in methodology ☐

SBIP-School Based In-service Programme

12. How would you like the help to be provided to the NIE graduates? Please tick in the boxes given below:

☐

i) Through correspondence
ii) Through workshops and seminars during the breaks ☐
iii) Individual teacher coming to the institute and seeking help ☐
iv) Lecturers visiting you during the Teaching Practice and tours ☐

13. Do you think that the training provided in NIE is adequate to make them competent English teachers? Please tick in the boxes given below:

i) Yes ☐
ii) No ☐

14. If **'No'**, what areas do you think they require more training? Please tick in the boxes given below:

i) Methodology ☐
ii) Literature content ☐
iii) Language aspects ☐
iv) Nursery rhymes ☐

15. Do you have any other suggestions for the NIE? Please mention below:

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Trashi Delekh

Trace Study on the (2002) 1st Batch of NIE Graduates, Paro
Questionnaire for other English teachers
(Please note: Confidentiality shall be maintained)

Date: .....

1. Do you think the B.Ed graduates from the NIE, Paro are competent enough to teach English? Please tick in the boxes given below:

   i) Yes ☐
   ii) No ☐

2. If **'Yes'**, for what level do you think they are competent? Please tick in the boxes given below:

   i) Lower Primary classes ☐
   ii) Upper Primary classes ☐
   iii) Lower Secondary classes ☐
   iv) Middle Secondary classes ☐

3. If **'No'**, what area/s are they not competent in? Please tick in the boxes provided below:

   i) Teaching grammar ☐
   ii) Teaching poetry ☐
   iii) Teaching prose ☐
   iv) Methodology ☐

4. Do you render help when the NIE graduates seek professional support? Please tick in the boxes given below:

   i) Yes ☐
   ii) No ☐

5. If **'Yes'**, how often do you render help? Please tick in the boxes given below:

   i) Always ☐
   ii) Frequently ☐
   iii) Rarely ☐
   iv) Never ☐

6. If **'No',** what are the reasons for not rendering help to him/her? Please mention below:

i).....
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ii) .....
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iii) .....

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.....

7. Apart from teaching English, are they good at teaching other subjects too? Please tick in the boxes given below:

i)	Yes	☐
ii)	No	☐

8. If **'Yes',** what are they good at? Please tick in the boxes given below:

i)	Mathematics	☐
ii)	Dzongkha	☐
iii)	History	☐
iv)	Geography	☐
v)	EVS	☐
vi)	Social Studies	☐
vii)	Science	☐

9. If **'No',** what do you like the NIE to do to enhance their capabilities? Please mention some points with reasons.

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10. Do you have any other suggestions for the NIE? Please mention below:

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Trashi Delekh

Tracer Study
Questionnaire for the 2002 (1st batch)B.Ed Graduates, NIE, Paro
(Please note: confidentiality shall be maintained)

Date: .....

1. What level do you teach? Please tick in the boxes given below:

   i) Lower Primary classes ☐
   ii) Upper Primary classes ☐
   iii) Lower Secondary classes ☐
   iv) Middle Secondary classes ☐

2. What other subjects do you teach besides English? Please tick in the boxes given below:

   i) Mathematics ☐
   ii) Dzongkha ☐
   iii) History ☐
   iv) Geography ☐
   v) EVS ☐
   vi) Social Studies ☐
   vii) Science ☐

3. Do you feel quite confident to teach English? Please tick in the boxes given below:

   i) Yes ☐
   ii) No ☐

4. IF **'Yes'**, till what grade are you confident to teach English? Please tick in the boxes given below:

   i) Class PP to class VI. ☐
   ii) Class PP to class VIII. ☐
   iii) Class PP to class X ☐

5. IF **'No'**, what are the factors that cause this difficulty? Please tick in the boxes given below:

   i) Inadequate English reference books. ☐
   ii) Other responsibilities to handle.* ☐
   iii) Inadequate subject knowledge. ☐
   iv) Inadequate methodological ideas in teaching a topic. ☐

   * Other responsibilities – Warden; matron; housemaster; club in-charge; librarian; scout master: storekeeper; games in-charge; cultural co-ordinator.

6. Do you find some parts of the topics of the classes you teach to be irrelevant? Please tick in the boxes given below:

i) Yes ☐
ii) No ☐

7. If **'Yes'**, name the topics and give at least two reasons why you think they are irrelevant.

i).....
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ii).....
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.....iii).....
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iv).....
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8. Does the teacher training that you underwent in the NIE help you as an English teacher? Please tick in the boxes give below:

i) Yes ☐
ii) No ☐

9. If **'Yes'**, what areas does it help you? Please tick in the boxes give below:

i) Methodology ☐
ii) Language ☐
iii) Literature ☐
iv) Life skills including the co-curricular activities ☐

10. If **'No'**, please choose and tick the reasons given below:

i) Training in the NIE and the school needs do not match. ☐
ii) Training equipped me with methodology, but not with content. ☐
iii) Training enhanced my content knowledge, but not the methodology ☐
iv) Good training does not solve the overcrowded classroom problems. ☐

11. Do you think that some parts of the modules offered in the NIE (as you received them) need to be changed to meet the field realities? Please tick in the boxes given below:

i) Yes ☐
ii) No ☐

12. If **'Yes'**, please name them and state reason/s.

i).....
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ii).....
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iii).....
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iv).....
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Do you share the view that you are strong in 'methodology but weak in content'? Please tick in the boxes given below:

i) Yes ☐
ii) No ☐

13. If **'Yes'**, what area of the content are you weak in? Please tick in the boxes given below:

i) Teaching grammar. ☐
ii) Teaching poetry. ☐
iii) Teaching prose. ☐
iv) Teaching nursery rhymes. ☐

14. In teaching of English, how useful is the module, "The Study of Language" in the school? Please tick in the boxes given below:

i) Very useful to the English teachers ☐
ii) Very useful to the students ☐
iii) Not useful to both ☐
iv) No comments ☐

15. Do you think the NIE has to include more language aspects in the B.Ed syllabus? Please tick in the boxes given below:

i) Yes ☐
ii) No ☐

16. If 'Yes', what kind of language aspects should the NIE include in the curriculum? Please tick in the boxes given below:

i) More sessions on grammar. ☐

ii) More sessions on pronunciation. ☐
iii) More sessions on writing. ☐
iv) More sessions on listening and speaking ☐

17. Is learning of literature in the NIE useful in teaching English from PP to class X? Please tick in the boxes given below:

i) Yes ☐
ii) No ☐

18. If 'Yes', in what ways does learning of literature help you as an English teacher? Please tick in the boxes given below:

i) Yes ☐
ii) No ☐

19. What are the problems that you initially faced in the school? Please name them.

i).....
ii).....
iii).....
iv).....

20. Did you overcome those problems? Please tick in the boxes given below:

i) Yes ☐
ii) No ☐

21. If **'Yes'**, how did you overcome those difficulties? Please mention some points.

i) .....
ii) .....
iii) .....
iv) .....

22. If 'No', what are the factors? Please name them.

i) .....
ii) .....
iii) .....

23. Does the school authority render professional help when you need it? Please tick in the boxes given below:

i) Yes ☐
ii) No ☐

24. If 'Yes', what type of professional support do you get? Please tick in the boxes given below:

i) Access to the library and the reference books ☐
ii) Your problems are thrashed out in the SBIP meetings ☐
iii) Gives support when you conduct literary contests ☐

25. How many SBIP* Meetings did your schools organize in the academic year of 2003? Please tick in the boxes give below:

i) None ☐
ii) Once ☐
iii) Twice ☐
iv) Thrice ☐
v) More than thrice ☐

26. Did you discuss any topic pertaining to English (in the meeting)? Please tick in the boxes given below:

i) Yes ☐
ii) No ☐

SBIP – School Based In-Service Programme

27. If ***'Yes'***, what topic did you seek help? Please briefly mention the outcome of the SBIP Meeting.

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28. Do you seek help from your colleagues when you are doubtful of a particular topic? Please tick in the boxes given below:

i) Yes ☐
ii) No ☐

29. If ***'Yes'***, how often do you discuss? Please tick in the boxes given below:

i) Always ☐
ii) Frequently ☐
iii) Rarely ☐
iv) Never ☐

30. If **'No'**, Please state reasons.

i) .....

.....

ii) .....

.....

iii) .....

.....

31. Do you expect professional support from the NIE to its graduates in the schools? Please tick in the boxes given below:

i) Yes ☐
ii) No ☐

32. If 'Yes', in what areas do you need the support most? Please tick in the boxes given below:

i) In providing the teaching learning materials ☐
ii) In providing the English reference materials ☐
iii) In providing the refresher courses in content ☐
iv) In providing the refresher courses in methodology ☐

33. When would you like the support to be provided? Please tick in the boxes given below:

i) In the beginning of the year ☐
ii) In the summer break ☐
iii) In the winter break ☐
iv) As and when the time permits ☐

34. How would you like the help to be provided to you? Please tick in the boxes given below:

i) Through correspondence ☐
ii) Through workshops and seminars during the breaks ☐
iii) Individually coming to the institute and seeking help ☐
iv) Lecturers visiting you during the Teaching Practice and tours ☐

Trashi Delekh

Sherubtse – a dream runs through it

- Tshering Gyeltshen
Twinpeaks Media & Entertainment

November 2003. The clock tower rises with a serene dignity into the vast expanse of cloudless sea-blue sky above Kanglung, home to Bhutan's only college of general higher education.

Inside the campus, with lawns that are still verdant at the approach of winter, evergreen trees blowing a gentle refreshing breeze, and the air suffused with the intoxicating aroma of a pristine natural environment, Sherubtse is all sensual delight and untainted paradise. It is idyllic and picture perfect.

And today, except for the subdued and comforting sound of nature, it is silent.

At the base of the clock tower, an enduring feature of the Sherubtse landscape often used as a simile to symbolize the lofty stature and high ideals of the college, final year Computer Science student Pema Namgay is trying hard to make sense of the architecture of microprocessors. Next to him sits Tashi Peldon, a commerce student, drumming a business account formula into memory. Each turned in opposite directions and engrossed in studies with a furious silence, they could well be strangers and not one of Sherubtse's fabled young romantic pairs.

Everywhere in the campus – under trees, in the football field, classrooms, corridors, hostels, and along the Trashigang-Samdrupjongkhar highway that rivers through the college campus – hundreds of Sherubtseans are laden with notebooks, textbooks, discussion papers, sample question and answer papers and various other paraphernalia of examination preparation.

Everyone appears to be studying, with eleventh hour gusto, for the final examinations.

About half a kilometer up the road, among the cluster of shops lining the highway, 62 year old Choden and her septuagenarian husband, Tashi Tshering, are idly sitting in front of their shop relishing the heat of the late November sun. Having settled here after their flight from Tibet, more than four decades ago, they are true local denizens. They are, in any case, older than the history of Kanglung as Bhutan knows it today. They have seen the little dusty roadside village evolve into a vibrant modern town and the fields below the road produce not maize and paddy like they did for centuries but a more valuable *crop* called "graduates".

"I did not in my wildest dreams expect such a transformation of this place," says Choden, who, as a young woman, witnessed the inaugural celebrations of Kanglung Public School on May 26, 1968. The occasion is distinctly fresh in her mind even today because it was the biggest event Kanglung had hosted at that time. There were grand, colourful, joyous celebrations for days and thousands of people from neighbouring villages had assembled in Kanglung to take part in the history-making event. It was

also the first time she had seen His Late Majesty who had come to Kanglung to personally inaugurate the “extraordinary new school”.

Thirty five years after King Jigme Dorji Wangchuck spoke, on inauguration day, to a rag-tag band of a hundred students making up classes one to four, about his dreams for and aspirations from the school, Sherubtse or the *peak of learning* (a shade romantically but otherwise so appropriately named by His Majesty the late King) has truly come into an element of its own.

Educationists today refer to it, perhaps a touch grandiloquently, as the “crown jewel” of the education system. Young Sherubtse graduates brag of having studied at “the premier academy of learning” and consider themselves the cream of Bhutan’s educated youth. Parents want their children to go there and higher secondary students, especially those studying Arts and Commerce, dream of pursuing college studies at “Shercol”.

Sherubtse is very much a celebrated institution. And this, to a large extent, is a legacy of its history. Around the time Sherubtse was first conceived, in the early 1960s, Bhutan had only around a score of ramshackle primary schools. Most Bhutanese students had to go to study in India – mainly to Kalimpong and Darjeeling. Bhutan desired to set up a modern high school of its own that could be compared, in academics as well as in facilities and infrastructure, to the better schools in Kalimpong and Darjeeling of the time. Sherubtse was, therefore, built as much out of need as out of a desire for a showpiece educational centre.

Bhutan’s first Prime Minister, Jigmie Palden Dorji, is attributed to have played an active role in the early conceptual phase of the new school. But after his assassination in 1964, Sherubtse essentially became the dream outcome of two shining personalities – the father of modern Bhutan, His Majesty the late King Jigme Dorji Wangchuck and Jesuit Ambassador, Spiritual Son of Bhutan and educationist of a rare order, the late Reverend Father William Mackey.

In the three and a half decades since its establishment the institution has faithfully and tenaciously lived up to the aspirations of its founding fathers. It has grown brick by brick, facility by facility, student by student, and realm by realm of education and learning.

The college has primarily gone through seven major phases of growth so far. From 1968 till 1972 it served as a secondary school. In 1976, it became a “junior college”, offering two-year pre-university studies in Arts, Commerce, and Science. In 1983 it was upgraded to a “degree college”, with affiliation to Delhi University (DU), offering general B.A, B.Com and B.Sc courses. In 1989, after two decades of being run by Jesuit educationists, Dasho Zangley Drukpa took over as the first national principal of the college. Sherubtse shelved its general degree courses and introduced Honours programmes in 1991 in Commerce, Economics, and English Literature, followed by Honours programmes in Geography and Dzongkha in 1996 and Computer Science in 1999. It got rid of the pre-university studies in Arts and Commerce in 1997 and subsequently in 2001, with the removal of the pre-university Science studies, it morphed into a full-fledged university college. With the establishment of the Royal

University of Bhutan (RUB) in June 2003 Sherubtse became a constituent college of the national university along with eight other institutions.

Today, at the dawn of a new era of higher education in Bhutan, Sherubtse appears well poised to retain and renew its grandeur and stature – in physical as well as in academic terms.

Spanking new buildings dot the sprawling 76.3 acre campus. Standing adjacent to the central academic block, the recently-constructed twin faculty buildings – a harmonious fusion of traditional and modern architecture – serve as robust sentinels, in more than the literal sense. The original two hostels have now grown to seven, all fitted with cable TV. Two more "80-seater" hostels are expected to be built in the near future. There is a wide choice of sports facilities and the college boasts the largest library among educational institutions in the country with around 25,000 books, an equal number of volumes of religious texts and regular subscriptions of over 85 periodicals and journals. Within the ninth five year plan a technologically enhanced "new-age" lecture theatre is expected to be constructed.

From a modest start with just eight teachers in 1968, Sherubtse's staff strength has today grown to 64 lecturers. Twenty-two are Bhutanese and most are Sherubtse's own alumni. The college is laying particular emphasis on national faculty development. It ultimately plans to build up a national faculty body of 85-90 percent retaining only, according to the fourth and current national principal, Dorjee Tshering, a small number of highly qualified and experienced expatriate lecturers for "cross-fertilisation".

Sherubtse presently provides Honours courses in seven disciplines, including B.Sc Honours in computer science. The college in fact sees itself as being comfortably positioned to lead in providing IT education in the country.

Considering that it only had six dilapidated hand-me-down computers from donor agencies in 1988, when computer studies first started as an optional subject for pre-university students, Sherubtse's IT facilities today are admirable.

The college now has about a hundred Pentium-driven computers. There are two well-endowed laboratories for IT students and the two computer centres for general student use, with a total of 40 computers, provide free internet access through a 256 K lease-line. The college is even exploring the possibility of wireless internet connectivity in the hostels and is all set to introduce a Cisco-certified networking course. A postgraduate certificate course in teaching information systems begun as a winter programme since 2000, mainly for high school teachers, is seen by many as a success. The college has further begun work to establish an e-learning platform that will help interested people upgrade their IT skills through it and also provide information to anyone who wishes to access it. An IT centre, housing labs, seminar rooms, mini lecture theatres, conference rooms and multimedia facilities, is in the pipeline.

"IT is an enabling technology and it offers a lot of scope not only for the college but also for the nation," says Shercol alumnus, head of the department of mathematics and computer science and one of the three assistant principals, Nidup Dorji. "Given our geographical landscape and rugged terrain, IT can bring solutions in all spheres of

life – in governance, health, education and commerce. It can be a viable industry provided we build up a strong human resource base. And this is where Sherubtse can play a meaningful role."

To fulfil this role the college has already developed an indigenous Computer Science program, suited and relevant for Bhutan's needs, soon to be implemented as a B.Sc Honours degree under the charter of the RUB.

While the times ahead look as promising and exciting as times gone by for Sherubtse, the road to success has not always been filled with rose petals. There have been thorns as well. Lately the college has come into focus for all the wrong reasons. Reports abound of students indulging in drugs, alcohol, vandalism, and other anti-social activities. Many people, speaking from first-hand experience, voice serious concerns about the downturn in discipline at the college.

"I was appalled to see a group of Sherubtse students having a drunken fist fight while on a tour in the east," says an alumnus who wishes not to be identified. "I felt embarrassed to think I was a Sherubtsean too."

College authorities concur. "I cannot deny that we are confronting social ills in the college," says Principal Dorjee Tshering. "I think it's a consequence of overall development. These students are actually a tiny proportion of the student body but they are enough to make a dent on the image of the college. We are doing everything possible – using the stick as well as the carrot – to get everyone on track."

Yet others think Sherubtse graduates lack intellectual depth, they are not analytical, they cannot take initiative on their own, and fail to express themselves intelligently and coherently, many observers and employers, both in the government and the corporate sector, point out.

"I have come across Sherubtse graduates who cannot even write decent job applications," says a broadcast journalist and Sherubtse alumnus. "This is not saying much about the so-called cream of our society."

Yes, trouble is brewing, college authorities agree, and say it largely stems from "over-teaching and over spoon-feeding". Principal Dorjee Tshering believes that there is a need "to transfer the responsibility of learning to the students". "So far there has not been much effort for effective learning on the part of our students. For instance, they leave everything for the final exam. Then they start cramming."

The college is now embarking on a number of initiatives to make teaching and learning more effective and result-oriented.

From the next academic session the 50 minute lecture periods will be increased to one hour. This will, however, not lead to an increase in the number of hours spent in the classroom. Total daily classroom hours, according to the principal, will in fact decrease by 20 minutes.

The annual academic session will be divided into three terms and there will be continuous internal assessment and evaluation of students' work and activities in

each term. The internal assessment will be based largely on classroom participation, submission of independently executed assignments, and tutorials. During tutorials students will be encouraged, and in fact required, to hold discussions, make presentations, and conduct seminars or workshops.

Unlike in the past when results depended entirely on the performance in the final exams conducted by Delhi University, students will now be given 25 percent grading, in the overall evaluation of their results at the end of each year, from internal assessment.

“We want to foster more accountability in teaching and learning from both parties,” says Lhatu Jamba, a Sherubtse alumnus from the first graduating Class of 86, who is now an assistant principal and head of the commerce department of the college.

And, so, Sherubtse charts its course ahead. And, yet again, finds itself at a crossroads. The college has been at the crossroads many times before but this one may prove to be a seminally crucial one.

As a constituent college of the RUB, Sherubtse now must function as an independent tertiary institution that awards RUB degrees. But this may be easier said than done. Sherubtse was made an affiliate college of Delhi University by a special bill of the Indian parliament. The college is still academically controlled by DU with the Royal University of Bhutan maintaining only administrative control over it. It has two vice-chancellors – one from DU and another from RUB, perhaps the only college in the world to be in such a peculiar position. Ceasing affiliation to DU, a time-frame for which is currently being worked out, will involve a number of prickly considerations among which developing its own courses and curriculum must rank foremost.

This is perhaps the biggest challenge confronting the college in its short history – to design indigenous courses that will have relevance within the country and, more importantly, recognition beyond national borders. To produce graduates who are equipped with the skills and knowledge relevant for employment within the emerging job market in the country and even abroad, which must surely be a major objective of the college, will be no walk in the park.

If curriculum development is a difficult task finding the resources to implement it, once developed, and then ensuring its sustainability will be another bone-crushing undertaking.

Principal Dorjee Tshering, in fact, argues that the present fully government-subsidised mechanism of providing higher education will not at all be sustainable in the long run. He claims that he is already running one of the most expensive colleges, if not in the world, then in the South Asian region. Even with generous funding from the government the college, he says, is perennially on a tight budget and often ends up short of money for books and electricity.

Sherubtse’s budget for the 2003-04 fiscal year is Nu. 76.59 million, with a recurrent expenditure alone of Nu. 46 million. “This is excluding the cost of infrastructure already in place,” says Dorjee Tshering. “We also have the highest student teacher

ratio in the world. In science it is 1:7 and in other subjects it is 1:16. Our per capita expenditure is Nu. 54,000 per student per academic session."

There are 843 students in the college today. By 2010 student number is expected to double the current figure.

Education officials and college authorities are often at pains to explain that it will be cheaper for the government to send students outside the country to study than to maintain an expensive institution like Sherubtse.

Why, then, must there be Sherubtse? What use does it serve Bhutan?

"Sherubtse has made significant contributions to the development of our country," says Thakur Singh Powdyel who, during his decade and a half tenure as the Vice Principal of the college, played a key role in shaping the identity and character of the institution. "The alumni of Sherubtse are serving the country in different capacities, supplying the much-needed educated human resource for the rapidly expanding requirements of the various sectors. The level of commitment and industry demonstrated by our Sherubtse alumni is much commended by their superiors. Sherubtse has done the country proud."

The statistics indeed look impressive.

By December 2002, 292 men and women had received Honours degrees in Commerce, 197 in Economics, 140 in English Literature, 79 in Geography, 42 in Dzongkha, and nine in Computer Applications from Sherubtse College. Since the first group of 37 graduates joined the world of work in 1986, the college has produced 1,342 more by December 2002. These people today run government ministries, departments, schools, banks, hospitals, business houses and serve the country in and through a whole gamut of professions. Some from the early batches have reached senior bureaucratic positions such as Directors and Dzongdas. Between 1978 and 2002, 1,364 students had also completed their pre-university science studies from Sherubtse and many of them have either already, or are training to, become doctors, engineers, aircraft pilots, veterinarians, architects, pharmacists, geologists, and agriculture scientists.

Ardent supporters of the college point out the other indirect but nonetheless far-reaching contribution of Sherubtse to nationhood and nation-building. Sherubtse, according to them, is a microcosm of Bhutan. Students from all 20 dzongkhags study at the college and it, therefore, provides a perfect Bhutanese environment and milieu. "In many ways Sherubtse is the melting pot of the country," says Thakur Singh Powdyel. "It draws students from across the length and breadth of our country. Students coming from different parts meet and develop abiding friendships and understanding here. We need this friendship for the strength and unity of our country."

The most important reason, perhaps, is that Sherubtse is Bhutan's own.

"I believe the primary philosophy of establishing this institution is not merely to award degrees but to be an institution where the Bhutanese character is emphasized," says Principal Dorjee Tshering. "This is the significant vision that has shaped and will

shape the character of this college and our alumni." He asserts that besides acquiring degrees, Sherubtseans gain tremendously from the "hidden curriculum" – that of studying amidst the country's own living ethos and culture. "Students here are in perfect tune with the pulse of the nation," he says.

If the nation and everyone else has benefited from Sherubtse so, it appears, has Kanglung. Sherubtse effectively fuels and sustains the local economy. Scores of men and women from Kanglung geog work as support staff in the college administration. For farmers in the area Serubtse provides a ready market for their produce. Twelve shops and five restaurants either directly or indirectly depend on the college for their survival. Shopowners say their businesses slump by as much as 75 percent and, in some cases, even 90 percent when the college is closed for vacation.

"We have done as well as this only because of the college," says Aum Chhime of Palas – favourite social rendezvous patronized by generations of Sherubtse's starry-eyed Romeos and Juliets. The thousands of hot cups of *phi-ka* these love-struck pairs downed, while professing even more steaming commitments of eternal amour, have certainly contributed to the growth of this roadside tea shop that started out from a tiny hut three decades ago. Today Palas runs an Internet café, a gift shop, a public call booth, and a restaurant with lodge and a poolroom. It is, without doubt, a business entity of reckoning in Kanglung.

And while not all of Sherubtse's romantic liaisons struck in the cozy corners of Palas have progressed all the way to the matrimonial altar, there have been many happy endings. "To me Sherubtse means a lifetime of loving," says Karma Tenzin, who not only picked up a degree in English literature but also his wife from there.

For hundreds of others who have journeyed through Sherubtse, it means a hundred other things.

"I often feel life came full circle for me at Sherubtse," says Class of 2000 alumnus, Kesang Choden. "I can present myself to the world with dignity and confidence today because of Sherubtse."

"Sherubtse College is the temple where I first lighted the candle of my life," says another alumnus, journalist and writer, Gopilal Acharya. "The flame still persists – guiding me unfailingly strong and unburntoutable."

"I spent fifteen most memorable years of my life in Sherubtse," says Thakur Singh Powdyel. "It was hard work, but most fulfilling. The most unforgettable aspect of it all was to follow the chastening idealism and the promise so richly evident in our young men and young women who come from all over the country."

Thus the saga continues. From just imparting the rudiments of education to exploring and scaling the finer and profounder realms of knowledge and learning, from being merely a showcase school to a mature university institution – Sherubtse has traveled eons.

Sherubtse is a beautiful story written by two great men from two ends of the world who came together to dream a wonderful dream for a nation. It is a story that has

many happy chapters. And within this story are many more stories – stories within stories within stories – all involving the nation's champions of knowledge, intellect, and wisdom.

Sherubtse, in its passage through time, will doubtless have naysayers as well as defenders. It will climb heights and suffer setbacks occasionally. But, in spite of its fleeting fortunes, from its wombs shall flow into the embracing arms of the nation young men and women who will keep the engine of society whirring on the road to growth, progress, and happiness.

This, after all, is the principal dream dreamt by Sherubtse's founders. And this dream still runs through it.

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Centre for Educational Research and Development

The Centre for Educational Research and Development is an idea whose time has come. The Centre has the following goals, among others:

- to support and undertake comprehensive and systematic curriculum development activities aimed at bringing about improvements in our education programmes;
- to foster a culture of enquiry and analysis in the continuous search of knowledge through regular interaction with research centres and institutes of repute;
- to study the current educational practices and developments in relevant fields and provide findings to the Ministry for consideration of policy options in relation to relevant educational goals, content, and methodology;
- to provide a forum for educators and researchers to support action-research and professional development for enhanced performance by our education stake-holders.
- to promote a national pool of scholarship and professionalism in the best traditions of research and development, for the flowering of the Bhutanese mind.

The major thrust areas of the Centre are research, publications and the professional support. To date, the Centre has developed a set of national standards for English for schools in Bhutan called *The Silken Knot*.

It has carried out a study on and made recommendations for the improvement of primary education and initiated modest programmes like the *Rinpung Experiment* and professional development activities, apart from participating in the *National Education Assessment*, among others.
CERD is currently working on the development of national standards for Mathematics and intends to do so for other discipline areas in the near future.

The Centre has followed the evolution of our education system and published *The Call: Stories of Yesteryears*, and begun an educational journal called *Rabsel.* The Centre's latest publication is *Yontoen: the CERD Occasional Papers.*

Encouraging and initiating action research being one of its thrust areas, CERD invites contributions from our fellow-teachers, scholars, parents, students, and indeed, from anybody who has a stake in education, highlighting issues which have a bearing on the education of our children and the system as a whole.

Please send in your research papers, both hard and soft copies, to:

The Director
Centre for Educational Research and Development
NIE, Rinpung, Paro: BHUTAN

Or, email them to cerdir@druknet.bt