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Note for an Editorial

Rabsel has come some way in promoting one of the major goals of the Centre for Educational Research and Development – to encourage and stakeholders. Beginning with the maiden issue, the response of our educators has been very heartening.

This Spring issue brings together an interesting assortment of very engaging educational issues. Given the wide-spread concern that the standard of writing of our students is not satisfactory, *The Writing Process Model* should be particularly helpful for teachers trying to promote the writing skills in our schools.

We get a very powerful insight into the behaviour of test items in *A Trial Test for Benchmarking the English Language Skills of Grade VI Students in Bhutan*. The advantages of number-sense come through very clearly in *The Relationship between Estimation Skills and Computational Ability of Students for Whole and Rational Numbers*.

Dedication to Learning throws chastening light on what it takes to succeed in a field that is dear to one's heart to find fulfillment and joy, as *Awakening to Narratives of Experience* follows a journey into discovery and experience. The Cumulative force of an educator's experiences and reflections finds its way into the Professional Development of Teachers, while the *Attitudes of Grade VIII Students in Bhutan towards Bhutanese History* give us reasons for concern.

Whatever happens behind the good results, at times, is probed in the study *Screening of Students prior to Board Examinations*, just as an *Analysis of Lower Secondary School Certificate Examination Results* reveals the ups and downs in the life of examinations.

Many titles, but one theme: education. The bulwark of a nation's strength. Education ghat lights up the life of a country's people. Education that defines what is **true** and **good** and **useful**.

Thakur Singh Powdyel
Director.

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**Using the Writing Process Model to Teach Writing at the
Junior High School Level in Druk Yul:
An Action Research**

By
Lhundup Dukpa

ABSTRACT

In this study, I describe the ways in which the Writing Process Model is an instructional strategy used for the improvement of writing instruction in English. The study was conducted in a junior high school. The research participants included three English language instructors and myself. The data collected were based on teachers' reflections, students' feedback, as well as reflections on my own teaching experiences.

The results of the study

- indicated that the Writing Process model can bring a radical change in the teaching of writing. The model proved to be a useful strategy in providing specific and easy directions to teach writing both at the primary and lower secondary classes;
- discovered that students were supportive of this model. They found writing to be a more interesting and valuable strategy in their learning of English;
- found that the extensive length of time needed for implementation was perceived as the main drawback;
- found that the shortage of writing materials was an inhibiting factor. The need for reference books on the principles of the Writing Process and professional development services were also indicated.

Suggestions and recommendations for further studies on this aspect of teaching writing include: the need to show how each of the writing themes helps an individual student's growth in writing; the relationship between proficiency in writing and academic achievement; and in general, the effectiveness of the Writing Process Model.

ACKNOWLEDGEMENTS

This study was made possible with financial assistance from the CIDA project. I am deeply grateful to the Royal Government of Druk Yul for nominating me for this study and CIDA for awarding me a scholarship to study at the University of New Brunswick, Canada.

THE PURPOSE OF THE STUDY

The purpose of this study is to discover the ways in which the Writing Process Model is an appropriate instructional technique for the teaching of English as a second language, particularly writing in junior high school classes. The motive behind the study was to promote the English language teaching methods. The techniques of teaching writing in English are addressed because students' success or failure in all subjects - science, mathematics, and the humanities - depends upon their understanding of and ability to use the English language.

Bhutanese educational researchers (Sonam Daker, 1996; Kinga Dakpa, 1994; Sangay Zam, 1991) have reported that teachers' difficulties in language instruction were caused by a lack of training in teaching methods and an inadequate supply of teaching materials. Drawing on my own experiences, both as a language teacher and as a school administrator, I am convinced that teachers' inadequate knowledge in language teaching methods could seriously hamper children's opportunities to learn in all other subject areas.

THE RESEARCH QUESTION

The main question guiding this research was: In what ways is the Writing Process Model an appropriate instructional strategy for the teaching of English, particularly writing in classes at the lower secondary school level (class VII to VIII) in Druk Yul? In order to focus the study, this general question was broken into sub-questions:

- How could the Writing Process Model be carried out?
- How do teachers and students respond to this model?
- What are the benefits of this model for children in Druk Yul schools?
- What factors either support or inhibit successful implementation?
- What are the implications of this research for teachers and curriculum developers in Druk Yul?

THE THEORETICAL FRAMEWORK OF THE STUDY

The Writing Process Model is a model based on what "real" writers do. It has gained steady support from a growing body of teacher-researchers over the past four decades (Graves, 1983, Atwell, 1987). They claim that the process approach to writing promotes divergent, analytical, and critical thinking skills in students. In this model of teaching writing, learners are guided to construct meaning rather than paying attention only to grammar and conventional language rules. Learners learn to construct meaningful content by studying "real" texts. They seek first-hand information from real sources, for instance people.

Writers and teachers (Atwell, 1987; Calkins, 1983; Graves, 1983) have shown that when children are engaged in the process of composition, they learn to express themselves consciously. The focus of writing instruction is not on the completed composition but on assisting learners through the process of composing. Students share their work with friends and are given opportunities to read, discuss and listen to responses from their peers and teacher before they decide to publish the work. In this way, mistakes are dealt with during composing rather than at the end when students consider their work finished.

In her book, Lessons from a Child (1983), Calkins observed consistent development of writing skills in a young writer. The students were able to perceive writing as a learning tool as well as a medium of communication to express and release frustrations, anxiety, fears, hopes, ambitions, demands, and feelings of sadness and happiness.

Schroder and Lovett (1993, p.48) saw positive results when they followed the writing process approach with their third graders. They observed dramatic changes in their

students' abilities to write well as a result of using this new approach. They had classes in which children enjoyed writing and knew the camaraderie of working together, showing one another how to be writers. These teachers particularly valued the process approach to writing because it fostered collaborative learning and improved students' ability to write well.

Tchudi and Tchudi (1991, p.114) argue that, instead of giving students forms and structures to master, teachers need to guide learners in the skills, activities, and processes of composing, and show them how to engage in the acts of composition successfully. The Writing Process Model provides skills rather than exercise drills. It shows the processes of composing rather than dictating rules about writing. It provides freedom of choice of topics thus encouraging freedom of thought and expressions in the learners.

The process approach to writing as developed by Graves (1983), Atwell (1987) and Calkins (1994) is generally described according to five key components: pre-writing, drafting, revising, editing, and publishing; and five essential elements: choice, purpose and audience, response, ownership, and time. These stages of developing a text are however, not meant to be carried out in a linear fashion. Instead, each type of writing activity is carried out based on a writer's needs or goals at any given point in time as a text is being developed.

RESEARCH METHOD: ACTION RESEARCH

Action research method was employed to discover the ways the Writing Process Model is an appropriate instructional strategy for the teaching of English. Action research is the study of a social situation with a view to improving or changing the quality of action within it (Elliott, 1991). *In action research, theories are not validated independently and then applied into practice. They are validated through practice (Elliott, 1990, pg.69).* Action research is trying out an idea in practice with a view to improving or changing something (Kemmis, 1983).

BACKGROUND TO THE STUDY

The research was conducted in one urban junior high school with three English language teachers. Two of these teachers were the teachers teaching English in the upper primary classes (classes VII and VIII). A Class II teacher was also invited to participate in this study because I was interested in finding out how the Writing Process would work in the lower classes.

ROLE OF THE TEACHER PARTICIPANTS

The teachers' roles were to practise the method in their lessons and to provide critical and analytical feedback. They were to act as informants, critics, and support the researcher by giving feedback based on what they discovered when they used the method.

ROLE OF THE RESEARCHER

The researcher played the role of a researcher-participant. I was constantly available to the participants to clarify their doubts, answer questions, suggest solutions, and note any difficulties and problems encountered. I also taught in one of the Class VII sections. My lessons were designed to find out whether the Writing Process Model could be implemented as an approach to the teaching of writing. After every lesson, I reflected on my own teaching experiences and observations and recorded them in my journal.

DESIGN OF THE STUDY

A series of workshops on the Writing Process Model were given to the group members in order to introduce them to the theoretical aspects of the model. Each teacher selected a class in which he or she wished to implement the method. Resource materials, a package of articles on the Writing Process Model, were distributed to the teachers at the first meeting.

After the initial meeting, the group members met with me at my house every Sunday to discuss the content of the Writing Process and to share their personal classroom experiences. This sharing was structured in terms of interviews through open-ended questions. However, most of the time, I depended upon questions which were generated during the on-going discussions. These discussions were tape-recorded and later transcribed.

Occasionally, informal conferences were held after school hours. These conferences were held to discuss feelings, on-going classroom problems, and assumptions about the Writing Process Model. The teachers were also asked to keep written records of any strong points and limiting factors. At the end of the research, the teachers submitted a personal reflective report answering the following questions:

- How did you go about implementing the method?
- How did the Writing Process Model benefit you?
- What supporting and inhibiting factors did you observe during the process of implementing the programme?
- What are the strengths and weaknesses of the model?
- How did your students respond to this strategy?
- What are your suggestions and recommendations to strengthen future implementations of the programme?

DATA COLLECTION PROCEDURES

The data collected included: teachers' interviews (tape-recorded), teachers' self-reflection reports, and feedback from students, reflections of the researcher's own classroom experiences and observations. The study lasted for forty days.

The following techniques were utilised to gather evidence in the monitoring phases of research: a) Field Notes; b) Photographic Evidence; c) Curriculum Documents; d) Interviews; and e) Self-Reflective Reports.

TRIANGULATION

Triangulation is a general technique employed to bring “different kinds of evidence into some relationship with each other so that they can be compared and contrasted” (John Elliott, 1990, pg.82). In action research, the evidence gathered by using different data collection instruments such as interviews, observations, and reports can be compared and contrasted to elicit data. I employed three different evidence collection instruments such as teacher interviews, feedback from both teachers and students, and my personal classroom experiences.

The evidence that I gathered was cross-checked and compared to elicit and validate the information. The information collected was also utilised to discover the strengths and weaknesses of the Writing Process Model and to find out the inhibiting and supporting factors, which affected the implementation process.

CONCLUSIONS

Teaching writing to help children learn to use the written language for social and intellectual growth is a priority in the English language instruction. In our schools, writing instruction was primarily viewed as the teaching of punctuation, spelling, and correct usage of grammar. As a result, class time was devoted to spelling drills, vocabulary exercises, and discussions related to the content of the published stories in the textbooks.

Students were often asked to write a composition on an assigned topic, and the composition was then submitted to the teacher for correction. Errors were corrected and then handed back to the child with little or no discussion. The focus of writing ended between the process and the finished product. There was no student involvement in revision and editing processes, activities vital for the students to practise. The product was not shared with an audience. Good writing was, therefore, a considered as knowing how to spell and punctuate and knowing the parts of speech.

Writing was not viewed as a medium of communication to share thoughts, to shape and organise thoughts, to discover new knowledge, to present views and opinions, or to share intellectual skills with the community of learners. This lack of understanding of the major purpose of writing appears to be one of the biggest problems in our schools, a problem that is hampering both teachers’ and students’ competence in teaching and learning about writing.

Writing can capture our fleeting thoughts, which could disappear completely from our minds. Writers can make meaning out of the things, which initially did not make any sense. Insignificant details can unfold new insights and significant meaning when writers allow their thoughts to spill onto the paper.

The act of writing can also drive writers to read more as they hunt for new information from various sources. Another vital task performed by writing is that through the act of writing, we can “win the hearts of millions”. This is called persuasive writing. We find ourselves being influenced, persuaded, and seduced by all kinds of print

literature in our daily life. We need to teach our children to write effectively and meaningfully in order to influence people's lives so that, through writing, some positive changes in society can be made. It is the shaping of the meaning of writing that writing teachers should be more concerned about. This kind of writing is called reflective or critical writing.

Writing, therefore, should be viewed as an art, which can be used for a variety of purposes: as a medium of communication to express thoughts and feelings; as a learning tool to discover and seek new information; and as a record which can entomb and celebrate the diverse cultures and traditions followed by different races. Therefore, teachers of language arts must disseminate this information about writing to the younger generation.

RESULTS OF THE STUDY

Pre-writing: Topic choice. In this step, students are encouraged to search for ideas for topics to write about through brainstorming, researching, conferencing and discussing. Outlining and planning ideas, drawing and recalling experiences, reading and listing ideas are also effective pre-writing strategies. During this stage of text development, students also select the form or shape the text is to take, identify their audience, and clarify the purpose of their writing. The teacher's role is to provide students with the skills involved in idea gathering and offer guidance in their decision-making. Teachers also argue that writers need freedom to choose the topics they want to write about. Choice of subjects provides the children with an opportunity to express their own feelings and opinions. The lesson on "topic choice" was designed to discover if students could find their own topics when allowed to choose and see how children responded when given the freedom to choose a topic.

The following questions were used to get their response:

- Will children be able to find their own topics to write about?
- Do they like choosing their own topics?
- Will they change their attitudes towards writing when given the opportunity to express their own thoughts and feelings?

DISCOVERY

It was discovered that students prefer to write on their own topics. It gave them the personal freedom to express themselves in their own words. It was also found easier to guide the students in extracting content ideas when the topics were based on their own experiences. By asking questions or giving prompts, students were able to recall past experiences and share those experiences with their friends and with the teacher.

Based on the findings, I strongly *recommend that children should be allowed to write on self-selected topics*. Unless children understand and perceive writing as a medium of expression through which they can reach the world, they will never take advantage of the benefits of writing. It is very important that children see writing as a tool to discover themselves and the world around them. The goal is to have them construct and deconstruct meanings from the things that they hear, see, and feel every day in their lives.

2. DRAFTING – COMPOSING

Students begin to write once they have selected a topic. They are provided several opportunities to produce a number of drafts before a final copy is submitted for grading. Writers are encouraged to write large chunks of information without worrying about the mechanics or grammar. Teachers and peers can help writers recall ideas or generate added detail by asking questions about the information written. At this stage, ideas are put into some rough order. To find out how students and teachers perceive the importance of drafting, they were asked to respond to the following questions “How many drafts did you write before you finally published your writing?” and “Why is drafting important to you?”

DISCOVERY

When given enough opportunities to refine, add, polish, and reread their pieces until they were completely satisfied with their final products, students show great improvement in the areas of content development, spelling, punctuation, and grammar. In the traditional method, students rarely got a chance to improve their papers by following the procedures of revision and editing. Allowing them to produce a number of draft copies before their papers were finally graded provided opportunities for the teachers to continually assess and assist students’ development in writing skills.

My conclusion is that children should not be deprived of the opportunity to practise drafting since the objectives of English language lessons are to improve students’ language skills. Drafting activities give students the opportunity to improve their language skills.

3. REVISION

At this stage, students engage in revising their ideas. They add important information and delete unnecessary details. They engage in conferences with their peers or teacher to discuss how well the text is beginning to take shape. Writers ask readers to offer suggestions and constructive criticism, and then make changes accordingly. The teacher discusses revision skills with the children both before the revising process has begun, and continues to offer guidance and support throughout the revision process. In the teaching of revision, emphasis was given to modify content. Students learned how to look for details, excavate hidden thoughts, generate ideas, delete unnecessary information, add meanings to their details, and gather more relevant information on a particular topic.

As soon as students finished writing their first draft, they read, revised, and re-read their papers several times to themselves, and then repeated the process with their friends, and finally with the teacher. Individual and group conferences were frequently conducted to offer guidance and ideas. During revision, students made changes to or substituted words with other interesting words or phrases. They picked up new words from the books, asked a friend or the teacher. These new words were then added to their vocabulary list.

Peer revision was conducted to support and encourage each other; they were not to be a *fault-finding exercise*. Students usually looked for the strengths in each other's papers; strengths such as good leads or endings, effective words, strong points, and interesting ideas. Sometimes, the group worked on how to write more effective beginnings and endings, or the use of effective words to describe a situation or event.

DISCOVERY

The revision practice allowed students to work collaboratively with little dependence on the teacher. They were able to add more points to their writing through discussions with their peers. Teachers guided and motivated children to think by asking questions and conducting conferences.

For many students, revision was a time for them to think more about the content. They tried not to worry about the conventions of writing. They also received enough help from their peers, an opportunity to learn from and help one another to solve problems.

It was also discovered that, when given the skills, students were capable of doing their own work. They were taught how to look for details, check for the completeness of the piece, where to look for ideas and information, and how to work with groups. They were also taught how to help each other with weaknesses and how to suggest solutions. Gradual changes in students' behaviours were observed as they assumed responsibility for their own work.

4. EDITING

When students first begin to develop a written text, they are discouraged from spending excessive amounts of time correcting the spelling and punctuation mistakes, since this interferes with the composing process. They are allowed to use invented spelling, omit punctuation and make grammatical errors. By the editing stage, students are to have revised their writing and set the content. Although they might like to make minor changes in their ideas, the focus, at this stage is on editing the mechanics of writing- that is spelling mistakes, grammatical errors, punctuation, and paragraphing. Editing skills are discussed with students to help them edit their own work before they ask for help from peers or teachers. Teachers may engage students in self-editing, group-editing or peer-editing. They may also supply information about contents or help individual writers or groups of writers to edit.

During the process of editing, self, peer, and group editing skills were the main focus of the study. The goal was to discover: a) how children handle editing when given the skills for them to practise; b) whether teaching the editing skills reduced teachers' correction workload; c) whether self, peer, and group editing improved students' writing skills.

While editing, students were asked to attend to the mechanics, one or two at a time. As soon a revision was completed, each student conducted a self- editing. After the initial self-correction, he or she made fair copies and asked their friends to proof-read the papers. The proof-reader pointed out one or two mistakes at a time to the writer. The children did peer-editing, in which two students got together and went through the paper together pointing out or correcting mistakes. If group-editing was taking

place, each member was required to read his or her friend's paper once or twice before the paper was handed in for teacher's correction.

Ownership is one of the concepts that children learn in editing lessons. The writing belongs to the writer and, therefore, the responsibility to accept, revise, edit, and make changes to the ideas should be the writer's. Teachers are there to help the children write what they want to write. They are also there to listen, to respond to students' enquiries, to ask questions about things, which are not clear, and to offer positive and constructive feedback.

Discovery

I was impressed by the way students handled the responsibility of correcting their own mistakes. This success resulted from the teaching of editing skills. The editing skills checklist showed students how to look for correct spellings, how to use punctuation marks, and to understand the functions of the parts of the English language. Students were also encouraged to correct every mistake that they made in their writing and maintain an editing checklist for future reference.

It was noticed that when students were engaged in peer or group editing, they were able to help each other, they no longer toiled alone, glued to individual seats and in isolation. The process not only improved their peer relationships, but they also learned to work in groups. The act of learning to write became a collaborative effort in which all learners lived in a supportive literate community. It was an impressive change in students' learning behaviours. Such a "literary society" not only improved student-student and student-teacher relationships, but also helped to break down the barriers created by a competitive and examination-oriented teaching and learning structure.

The model supported the notion of "handing over the responsibility of learning" to the children, which is also called "giving ownership of the work." Ownership refers to the choices writers have over their material. The writers have the freedom to express their own voices, have the choice to exclude or include certain ideas and pieces of knowledge, and they have the choice of genre. They have a vast knowledge from which they can write. It takes away the "ownership" from the writer if teachers assign a topic, particularly when writers have no knowledge of that subject. Assigning topics also deprives writers of the opportunity to explore and discover what is of concern to their lives. I feel that our students have not been given opportunities to take responsibility, so, when it was given, they lacked the knowledge of how to accept it. An effective way to deal with the volume of a teacher's correction load would be to *teach editing techniques to the students*. Editing techniques include self-editing, peer-editing, and group-editing. Teacher-editing was primarily used as an instructional mode and rarely in the correctional mode. These skills were discovered to be very effective in helping students correct their own compositions. These skills not only prepared students to handle responsibility, but also provided them with an opportunity to help and learn from their peers. Teachers could also gain time so that they could give individual attention to the students who need help.

5. PUBLICATION – SHARING

Publishing takes different forms depending upon the purpose of each writing task. Writers may like to send the articles for publication in newspapers or display the writings on the classroom board or on the school wall. Students' writings can also be compiled and made into a class or school magazine. The main purpose of publication is to make the writing public so an intended audience can read it.

Towards the end of my study, students of Class II, VII A and B, and VIII A prepared a writing exhibition for the school. The purpose was to find out whether allowing students to share their pieces with the public would motivate them to write more.

Publication day was a great day for all of the children in the school. For the participants, it was one of the happiest times in their lives. Some of the writers carried expressions of nervousness and others looked very excited as they waited for the exhibition room door to open. Hearts raced as participants eagerly waited for responses from their close school friends.

DISCOVERY

Following Atwell's (1987) points, my notion of publication neither involved competition among the students nor the selection of only good writings. I believe that all students can become good writers and will produce good writing if given the opportunity to express their feelings, experiences, and, most importantly, their opinions. Publication appeared in a variety of forms such as class magazines, school wall magazines, classroom displays of written journals, essays, stories, poems, book reviews, and contributions to newspapers. If children chose to write letters, they could write them to their intended audience and actually mail them. Children could prepare their personal resume or references for forwarding to a prospective employer.

1. PURPOSE, AUDIENCE, AND FORM

The sense of audience and purpose of writing is also one of the effective elements of writing discussed by researchers. Writers must have a sense of the audience for whom they are writing. Are they writing for friends? Are they writing for parents, teachers, head teacher or the general public? In addition to knowing their audience or readers, writers must also have a clear sense of why they write- is it to convey messages, personal feelings, express views, present arguments, to persuade, or to explain an idea.

When students did a piece of writing, they often had no clear idea about who they were writing to. Both teachers and students failed to identify the purpose (why they want to write on a particular topic) and audience (to whom they are going to write) since teachers were often the only audience. The focus, if any, was always on the form. Writing in class, according to many students, was done to improve their handwriting and learn format. Calkins (1995) and Atwell (1987) claim that if students write with a purpose and know that there will be an audience as well as knowing in which form they are going to present their idea, they take more interest in what they do. I believe in this practice and therefore wanted to find out whether this applied to our students. The following questions were the pertinent as my basis:

- Do students pay more attention to their work when they are aware of the purpose of writing and the audience?
- Can it change their perceptions about the writing task?
- Would it influence their way of thinking and encourage them to take more interest in writing?

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DISCOVERY

Students were instructed to specify their audience and purpose before they began to write. As a result, many children were able to focus their writing on a particular subject. In the beginning, my students chose very broad topics; the common ones being their childhood life, school activities, and winter holidays. They had so much to say about these topics that they rarely finished writing a piece. They wrote very long essays often with numerous spelling and grammatical mistakes and their writing made no sense to the reader.

Once the children were clear about why they write and for whom, their writing began to make sense. It was not difficult to teach audience and purpose once the student had chosen a topic. In the past, I noticed that my students' writing lacked focus. They began with a particular point, then were suddenly writing about a different subject. There was no real purpose to the writing. Writing was just a classroom exercise, and the purpose, if any, was simply to cover the syllabus. They didn't worry about public criticism since the work was never published. *Students should be given ample opportunity to practise writing with a particular purpose and audience in mind in order to motivate students to write meaningful pieces.*

2. CONFERENCES

A writing conference is "purposeful talk" between teacher and student or between student and student about writing. The purpose is to draw forth ideas from the students to stimulate their thinking, and thus lead them to doing their own thinking. While conferencing, students are given lessons on how to respond and give feedback. Response is important to help shape the writer's work. Writers need response from peers and teachers to refine, modify, select, and improve their ideas. The purpose of this lesson was to discover whether teacher-student or peer conferences were useful in the discovery of more ideas on students' topics. The students were asked whether conferences were useful and whether they wished the teacher talk to them or to write comments on the paper.

DISCOVERY

The purpose of conducting group conferences was to draw forth ideas, to share ideas, to create opportunities for students to support each other, and to allow individual student to talk with the teacher and must, therefore, be supported in the language classroom. Conferencing is an important teaching, learning, and sharing activity and was implemented as a regular part of the writing process. The focus of the content conference was on developing the content only. Issues such as grammar, punctuation, and spelling were dealt with later on when the piece of writing was ready for editing. The teachers' responsibilities were not to tell writers what they should write but help them find out what they knew, and show them that

teachers were interested in what they knew. Teachers then responded from their personal perspective. The teachers were told to assist children in producing better writers, not better writing.

The writing conference experience showed that students were able to generate more ideas for writing through discussions and were able to gain confidence in writing. When asked about the usefulness of conferences, children responded positively both for written and oral conferences.

3. WRITING TIME

To be able to write effectively and intelligibly, students need frequent and regular time to think and plan. Sufficient time allows writers to consider and reconsider what they have written. They need time to achieve clarity, logic, voice, and grace of good writing (Atwell, 1987). Writers also need time to share, listen, and pool ideas.

Writers (Atwell, 1987; and Calkins, 1994) considered "time" to be one of the most important elements that teachers must provide for students. Students require time to think, time to decide on a topic and time to draft, revise, edit, and draft again. They also need time while revising and editing their pieces to be involved in teacher and peer conferences.

It was my purpose to find out how students and teachers respond to the importance of time as given much emphasis by this model. The question, "how important is time factor to you when you practise writing?" was asked to both the students and the teachers.

DISCOVERY

I discovered that when students are given enough time to plan, prepare, and write, they are able to produce original and meaningful pieces of work. I learned that, like adults, students need time to think and rethink, read and reread, write and rewrite, as they wrestle to fix their language problems. They need time to ask questions, to clarify doubts, to look for information, to discover new insights, to wait for responses, and then to publish.

Although students found writing interesting and joyful, at times I could see the expressions of frustration and boredom on their faces. Writing was difficult and time-consuming. However, I discovered that the more time students spent in thinking, writing, revising, editing, and organising, the better their thoughts were presented. The teachers, though, have no arguments over the necessity of time but showed more concern about the syllabus coverage.

A possible solution to solve the problem of insufficient time is *to increase the time from thirty-five minutes to an hour for all subjects, particularly in the higher classes*. In this way, teachers need not run from one class to another every thirty-five minutes. However, long hours may not be advisable for young children. I suggest that, although it is impossible to create extra time, *with effective lesson planning and classroom organisation, the time allotted to the subject of writing can be utilised efficiently*. *I recommend that students should be given more than the normal (thirty-five minutes) allotted time to choose a topic, discuss the content, revise, and then edit papers.*

SUMMARY OF THE STUDY

From this study, I learned that, in general, students need guidance and support in the writing practices. The textbooks, Druk English Series, Books 2 and 3, must be supplemented to include more ideas about the teaching of writing. Teachers have been proceeding as well as they can, but they need a sense of direction for the teaching of writing. They should be able to guide and help students in the areas of topic choice, revision, editing, audience awareness, purpose, and publication. In addition, students should also be given adequate time to practise writing. Teachers should be fully aware of the usefulness of conferences, responses, positive feedback, and comments offered both orally and in writing. The teachers involved in this study agreed that the Writing Process Model provided them with a sense of direction for the teaching of writing.

The responses from the students were poignant. One student responded, "I would like to say that the writing process is a good method because we learned the methods to write well. We were taught how to write, not only what to write. But when you go, who will teach us English in this way. The other teachers may not teach like you. If we practise writing now, we will not face any problem in future."

Many students also suggested that they found it easier to learn the English language through this method. These positive responses indicated not only their understanding of the importance of English language but their strong understanding of the value of writing. Teacher modelling writing is an important aspect of the Writing Process Model. Studies conducted by Atwell (1987) and Calkins (1992) have confirmed that students learn more about writing when they observe adults engaged in real writing.

But writing by teachers is not a common practice in our schools. Many teachers, including myself, rarely or ever model ourselves as writers although we declare ourselves to be English language teachers. In many schools, there are no instances of teachers involved in writing stories or poems for their students. The students, therefore, have no adult models for writing activities. They only see their peers periodically engaged in writing compositions as assignments.

Modelling is one of the best instructional methods for the teaching of writing. Writing teachers must model writing in their classrooms in order to encourage students as well as to demonstrate the significance of writing. We must practise what we preach. I was most impressed with the enthusiasm shown by the teachers in the study to improve their teaching methods. Their participation in this study in learning about the teaching of writing is more than likely to result in the improvement of English teaching methods in the future. In fact, the teachers involved in this study expressed their concerns about their own English language proficiencies and saw in the Writing Process Model an opportunity to improve their language teaching proficiencies. They also felt that the Writing Process Model would be able to upgrade the students' proficiencies in English, particularly in writing. I urge the curriculum developers to look into the problems that teachers face in the teaching of writing. The curriculum developers may like *to study the possibility of including the Writing Process Model in the English Curriculum to help teachers in the teaching of writing.*

FACTORS SUPPORTING AND INHIBITING SUCCESSFUL IMPLEMENTATION OF THE WRITING PROCESS MODEL

I identified some important factors that both teachers and students viewed as important in contributing to or inhibiting the successful implementation of the Writing Process Model.

The teachers readily identified the fact that the Writing Process Model would help to make the act of learning to write “more interesting, effective and enjoyable.” It would also train the students to be more “self-reliant, independent, and hardworking”. The teachers perceived the need to change and improve their English Language teaching methods in two ways:

1. An urgent need to bring progress and improvement in the development of the writing skills of students; b) and the need to help students acquire strong English language proficiencies in order to do well in all curricular studies. They strongly supported the notion that the Writing Process Model would provide a “legitimate avenue” for students to learn all other subjects effectively. There were even stronger views expressed by the students in support of the Writing Process model as a good teaching method to develop their writing skills:
 - They believed that through the Writing Process Model, they were able to express their feelings and share those feelings with the audience;
 - They perceived writing as a way to discover new ideas and knowledge;
 - They claimed that writing assisted them in learning grammar, punctuation skills, spelling, and vocabularies; and
 - They were convinced that it was easier to learn the English language through this Model.

Thus, both teachers and students gave a high rating to the Writing Process Model as a means of improving their English language proficiencies. Also perceived by the teachers as being important to the successful implementation of the Writing Process Model was the availability of reference materials and in-service education. *I consider in-service training to be crucial if teachers are to understand the principles of the Writing Process Model.* Without the reference materials and in-service training, teachers will not be able to successfully practise and sustain the Writing Process Model.

Thus, the question of implementation raises the issues of prerequisite conditions, such as the availability of resource materials and the degree to which the attitudes of the teachers can be changed. Incorporating the knowledge of critical theory (positive and constructive) in the teaching and learning pedagogy, although essential, depends upon how accommodating and open our society is to criticism. Critical literacy will have tremendous impact on the society as a whole. Therefore, a the model must be modified to make it compatible with the Buddhist philosophy and make it suitable for Druk Yul.

The lack of writing materials appears to be a strong inhibiting factor in the implementation of the Writing Process Model. Clearly, the availability of resource materials has to be studied and rectified before any programmes are implemented.

Government intervention will be required to solve the problems of resource material shortages in the schools.

However, the shortage of resource materials and lack of classroom infrastructure should not hold us back from using innovative ideas, which are useful in developing our education system. The schools, with the help of community services, could solve many of the problems mentioned above.

A SUMMARY OF RECOMMENDATIONS

The study indicates that the Writing Process Model would benefit both teachers and students in teaching and learning writing. The model proved to be a useful instructional strategy in providing specific and easy directions to teach writing to the students, both at the primary and lower secondary levels. The teachers and students involved in this study strongly support the inclusion of the Writing Process Model in the English language curriculum.

The following ideas are recommended in order to support and upgrade the teachers' language teaching methods:

Although the lack of materials seemed to be a daunting issue to be considered, this problem could be solved if school authorities and parents support teachers. Schools and parents can help each other in the raising of school funds; they can organise literary shows and sell literary magazines. Government offices in the community may be able to donate surplus and used paper to be used by the students.

The inadequate supply of teaching materials can be worked out by encouraging teachers to commit themselves in research work and write books to be used by the schools. To begin this task, teachers will need government support in the form of financing, resource materials, and assistance with the publication of reading materials.

The CAPSD runs a quarterly curriculum Newsletter that is distributed to all schools in the country. This Newsletter provides an excellent forum for the discussion of educational issues. Besides encouraging teachers to contribute articles, the CAPSD might consider awarding cash prizes to the winning articles, thus recognising the efforts of the writers. The cash prizes can financially support the teachers to conduct and continue with further research studies. The teachers involved in this research study suggested a handbook on the Writing Process Model. This handbook must discuss the theoretical aspects of the Model: pre-writing, topic-selection, composing, revision, editing, publication, responding, conferencing, and evaluation. The handbook should suggest strategies to help students revise, edit and evaluate their papers.

And finally, the handbook should show how to integrate and teach such topics as

- ideas about teaching grammar within context,
- how to help students develop their spelling skills,
- how to teach punctuation and other mechanics of language, and
- how to help students build their vocabulary.

The research participants emphasised that many English language teachers at both the primary and secondary level often face difficulties when they have to teach grammar and conventional skills. Consequently, they need much support in teaching these areas. This study could help the CAPSD in planning an English curriculum that would be more relevant to our culture and traditions, and more suitable to our teachers and students. Further, this research should motivate and encourage other educators to conduct similar research studies. Educators in the country should be able to serve the needs of the educational system, address problems faced by our students and teachers, and develop strategies to resolve these problems without relying as much on foreign experts.

The Writing Process Model could be introduced into the English language curriculum at the National Institutes of Education in Samtse and at Paro. Although the model emphasises the teaching of writing, it can also help teachers in teaching reading. In the end, I would like to suggest an introductory course in an action research studies at the National Institutes of Education at Samtse and Paro. Teachers should be able to conduct classroom-based research on their own. This kind of study is crucial because then teachers will not only be able to update and develop their own teaching techniques but will also help them discover the causes of the teaching and learning problems which will help them to address the needs of the students more effectively.

The study indicates that the Model could be implemented to teach writing at the junior high school level. The feedback from forty-two Class II students and their teacher who also participated in this study provided enough evidence that the Model is also an appropriate strategy to teach the English language as well as writing at the primary level. Class II students demonstrated exceptional abilities to learn the skills of writing and used them as a tool to learn new skills and knowledge.

I am hopeful that this study will help the Curriculum Division, in particular the school administrators and English teachers, in their effort to develop an effective English curriculum in their schools. This study might help teachers in guiding their students to become proficient writers which will not only help the students to learn the English language but also learn to use writing as a learning tool to acquire new knowledge and information.

Researchers can only suggest ideas, solutions, and provide information about the on-going practices. However, it is in the hands of the school administrators and the classroom teachers to bring innovative changes in the instructional practices. If school administrators and the teachers recognise the needs of the children, and if they desire to improve and modify their teaching practices, they are empowered to take the initiatives. They can be the main instrument of change in setting up an effective education system that can provide both spiritual and secular education to our children.

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A Trial Test for Benchmarking the English Language Skills of Grade VI Students in Bhutan

- Doug McCurry, ACER

Introduction

As part of the last phase of the Second Education Project (1998 - 2003) funded by the World Bank and Swiss Development Corporation, the Ministry of Education in Bhutan has been developing tests of English and Mathematics to set a benchmark of educational standards at Grade VI.

A working party of staff from the Bhutan Board of Examinations of the Education Department of the Ministry of Health and Education, the Centre for Educational Research and Development, and the Curriculum and Professional Support Division was established in 2002. Members of this group took part in test construction and test analysis workshops in Colombo and Bangkok funded by the World Bank that were facilitated by consultants from the Australian Council for Educational Research.

This article outlines the test material developed by the working party for the Bhutanese Grade VI English test and the results of the trialling of test items undertaken in 2002. The article also describes the notion of a standardised test developed on psychometric principles. In particular, it examines some items that did 'not work' in the trialling, and it analyses what these items show about different kinds of test item and the performance of the sample of students who undertook the trial tests.

The Benchmark Testing Programme

The aim of the work described here is to develop a standardised test as a benchmark for monitoring educational standards in Grade VI in Bhutan over time. The trial tests were developed on psychometric principles which means that the items were written and then trialled with a small sample of typical students. The results of this trialling are analysed substantively and statistically, and a final form of the test is constructed on the basis of this trialling. The final form of the test will be administered to a representative, national sample of Grade VI students in November 2003. A national norm for the performance of Grade VI students in Bhutan in 2003 will be constructed from this testing.

The benchmark tests will not be made public, they will be kept secure so that they can be used again in future years. By using the benchmark test in the future, the Education Ministry will be able to see whether standards of performance at Grade VI are rising, static or declining.

The working party has also taken on more work by developing items for a mirror of parallel form of the benchmark test. This mirror or parallel form will be statistically linked to the actual benchmark test. It will contain the same kinds of items as the actual test, and it will be statistically equivalent. It is hoped that the mirror or parallel

test will be available for the use of teachers. By using this test teachers will be able to estimate how their students perform in comparison with the national norms established by the benchmark test.

A standardised test based on psychometric principles.

A test developed according to psychometric principles is one in which the process of trialling is used to determine the relationship between the performance of candidates on every item in comparison with the performance of the same candidates on the test as a whole. There are a range of ways in which this relationship between individual items and performance on the test as a whole can be determined. There are different and complex theories developed to explain and justify this approach, but they can be simply summarised as the principle that more of the students who get an answer correct should be those who do better on the test as a whole than those who did worse on the test as a whole.

One way this relationship can be tested is through the correlation of the performance of candidates on an individual item with the performance on the test as a whole. According to psychometric principles, there should be a positive correlation between those who got an item correct and their overall test score. (This relationship is tested by a statistic called a point bi-serial correlation.) In other words, there should be more of those who did well on the test as a whole getting an individual item correct than those who did not do well on the test as a whole.

If there is a positive correlation between the performance on individual items and the overall test scores, then the test is said to be 'internally consistent' or 'statistically homogenous'. In test writers' parlance, an item with a positive correlation to the overall test score is said to be 'working', and an item with a negative correlation with the overall score is said to be 'not working'. According to psychometric principles, all items in a test should be 'working'. Items that do 'not work' in a trial test are not included in the final test.

The kinds of items that were developed for the Bhutanese English trial tests will be outlined below. The items that 'worked' will not be examined here because they will go into the final form of the benchmark test. Some of the items that did 'not work' (and hence will not be used in the final form) will be examined here. As will be seen below, there are things to be learned from items that do 'not work' even though they will not be included in the actual test.

The Bhutanese English Benchmark Test for Grade VI

Three different trial tests were developed by the working party. The tests were used in some 10 schools from different parts of Bhutan, and each trial test was completed by between 200 and 250 students. The final benchmark test will be undertaken by between 15% and 20% of Grade VI students from a representative sample of schools in Bhutan.

A specification was developed for the English test. It had three components: reading, language and writing. The trial tests were one hour in duration with 25 minutes for

reading, 10 minutes for language and 25 minutes for writing. Reading was based on narrative and expository passages of about 250 words. Students were asked to answer 10 multiple-choice reading comprehension questions. There were five short-answer questions which also tested reading comprehension.

And there was a third section of the reading component which took certain words from the reading passage and posed the following question:

Make sentences of your own with the following words, keeping the same meaning as in the story.

The second component tested language knowledge. It included multiple choice questions testing spelling, vocabulary and grammatical knowledge or knowledge of English usage. The writing component gave students a general writing topic and the following directions:

Write a composition in about 150 - 200 words on the topic given below. You will be awarded marks on content, language and paragraphing skills. You are advised to first plan how to write and then begin writing.

The performance of the students on the trial tests was statistically analysed, and the following comments are based on this analysis.

Reading component

As would be expected, the easiest reading comprehension items were factual and literal rather than interpretive or inferential. These items asked questions like: What happened? To whom? How? Why? The trial candidates generally did well on these questions. They were able to comprehend what was going on in the passages well.

The hardest of the reading comprehension questions required the candidates to read closely and make specific interpretations. Students were required to make inferences and kinds of judgements. Some of these items required surprising or counter-intuitive answers. As would be expected, such questions were the hardest, but in general these items 'worked' because they discriminated consistently between the stronger and the weaker students. The stronger candidates were able to do such inferential and interpretive questions well even if the weaker candidates could not.

The comprehension questions were in both multiple-choice and short answer formats. And as would be expected, the short-answer questions were generally harder than the multiple-choice questions. As a whole, that comprehension items in the section of the trial test worked well.

The results of the items testing the use of vocabulary from the passage were surprising. Using the words **glittering**, **impatiently** and **upsetting** in a sentence so as to show their meanings, for instance, proved to be among the most difficult items in the tests. Only about 10% of candidates scored a mark for these items. The pattern of performance was very consistent for these items. The correlations were all quite high, so all such items 'worked' psychometrically. But the number of students who

scored a mark for these items was also consistently low. There were 10 of these questions trialled, and in all cases only 35% or below were scored correct, and for 7 of the 10 items below 20% were scored correct. These results are very consistent and surprising.

It is not clear why these questions were so difficult. As with the instances given above, the vocabulary of these items does not seem particularly challenging, and the students could deal with the comprehension questions about the passages well. It may be the case that candidates have a fair idea of what the target words mean (and they might be able to do a multiple-choice item requiring them to identify a synonym) but it may be

that the task of defining the word through use in a sentence was particularly difficult. If this is the case, then these items are testing defining words through use in sentences rather than vocabulary knowledge or reading skill. Even though these items 'worked' very consistently, it is not clear what they are testing and how what they are testing relates to reading.

Language and usage component

The language and usage component contained items testing vocabulary, spelling, punctuation and grammar/usage. It was not as consistently successful as the reading component, and quite a few items did 'not work'. The vocabulary, spelling and punctuation items were generally answered well by the candidates, but the grammar/usage items were not answered well by the candidates and they did 'not work'. Some of these items and what we mean when we say they did 'not work' will be examined below.

The following direction was used for the language and usage questions.

Put a tick (✓) in the box against the sentence with a mistake in punctuation or grammar.

Item 1 below is a question that 'worked' because 63% of candidates chose the incorrect alternative of C, and they were among the better performers on the test as a whole because the point bi-serial correlation for the correct answer was 0.43, and the correlations for A, B and D were negative numbers. These are the statistics of a 'working' item.

Item 1

- A. Take a knife, fork and a spoon.
- B. 'Stop!' called the policeman.
- C. How are you.
- D. It is there.

Item 1	A	B	C *	D	Missing
Percentage	16.0	16.9	63.6	3.5	0
Biserial correlation	-0.26	-0.21	0.43	-0.19	

Items 2 to 5 presented below are language and usage items that did 'not work'. They show what students in the trial sample were unable to do, and what is required of items in a test based on psychometric principles.

Items 2

- A. 'Wait a minute, I want to come too,' he said.
- B. This house is more better than our last one.
- C. There are many ways of doing that.
- D. The teacher distributed the sweets.

Items 2	A	B *	C	D	Missing
Percentage	51.5	23.8	12.1	11.3	1.3
Bi-serial correlation	0.10	-0.01	-0.10	-0.05	0.00

Only 28% of candidates chose the correct answer of B for item 2 while 51% chose the incorrect answer of A. Not only did a majority choose the wrong answer, the correlation for the correct answer was negative (meaning these candidates were not generally among the highest performers overall, and perhaps they guessed) and the correlation for A was only weakly positive (which means that some of those students were among the better ones overall). The majority of candidates were unable to see that the phrase 'more better' is not correct. So according to psychometric criteria, this item did 'not work'.

Items 3

- A. We walk over the river every morning.
- B. There are many ways to get there.
- C. Thimphu is a capital of Bhutan.
- D. My friend wrote a letter to us.

Items 3	A	B	C *	D	Missing
Percentage	34.20	18.6	24.7	21.2	1.3
Biserial correlation	0.11	-0.01	-0.09	-0.04	0.04

In item 3 24% chose the correct answer, but the correlation was negative (perhaps these students were merely guessing), while there was a weakly positive correlation for the 34% who chose the incorrect alternative A. Only 24% of candidates recognised that the phrase 'a capital' is illogical and ungrammatical, and so this item is 'not working' psychometrically.

Item 4

- A. I keep a diary of what happens each day.
- B. Buddha helped the hero of the story.
- C. It is my birthday in September.
- D. It is neither hot or wet.

Item 4	A	B	C	D *	Missing
Percentage	29.9	26.4	25.5	17.3	0.9
Bi-serial correlation	0.13	-0.20	0.01	0.04	0.06

Item 4 is significantly more difficult than items 2 and 3. Recognising that the term 'neither' pairs with 'nor' rather than 'or' is a subtle distinction that some native speakers do not make. The correlation shows that the more able students chose the incorrect alternative of A.

Item 5

- A. There is work to do but not enough time to do it.
- B. We ate a pear and a apple after dinner.
- C. Who is coming to the party?
- D. Didn't you do it too?

Item 5	A	B *	C	D	Missing
Percentage	28.6	26.4	13.0	31.6	0.4
Bi-serial correlation	0.07	0.05	-0.19	0.02	0.04

In item 5, 26% chose the correct alternative, but those students were no more able overall than the 28% who chose the incorrect answer of A. Some 74% of candidates did not recognise that a word beginning with a vowel must be preceded by the article 'an'.

These grammar and usage items did 'not work' well. It seems that the better students overall were not much more able to do these items correctly than the students who did worse overall. Clearly, grammatical distinctions of the kind presented above are too difficult for Grade VI students in Bhutan. Simpler distinctions (or a simpler testing format?) must be used to discriminate consistently among Bhutanese Grade VI students.

Teachers might ask themselves whether their students would be able to select the incorrect alternative in these items.

Writing Component

Two different topics were trialled for this section of the test. Topic A was asking for a point of view or opinion and topic B was a descriptive topic. The writing was scored on the three criteria of content (3 marks), language (3 marks) and paragraphing (2 marks). The table below shows the results of the trial tests for topics A and B.

	Topic A Point of view or opinion			Topic B Descriptive topic		
	Content	Language	Paragraphing	Content	Language	Paragraphing
0	17	19	65	13	13	45
1	61	54	28	21	41	30
2	17	21	7	35	37	25
3	4	5		31	9	

There is a very clear and significant difference in the results for each topic. The results for the descriptive topic B are very much higher than for the point of view topic A. 31% got a score of 3 for content on topic B and only 4% got a score of 3 for topic A.

The scores for language were closer with 73% getting 0 or 1 for topic A and 54% getting 0 or 1 for topic B. Surprisingly, the topic had a significant impact on the paragraphing score. 65% got 0 for paragraphing with topic A and 45% got 0 with topic B. 7% got a score of 2 for paragraphing for topic A and 25% got a score of 2 for topic A.

Overall, it seems that topic A was much more challenging than topic B, and the more challenging topic had a clear impact on the quality of the language use and paragraphing for topic A. These topics suggest that Bhutanese Grade VI students find opinionative topics significantly more difficult than descriptive topics. The notion of developing a point of view and offering an opinion is given significant emphasis in the Druk series textbook for Grade VI, but the trial test results suggest that this is an area of writing where Bhutanese Grade VI students are not performing as well as they do on simpler descriptive topics, or as well as might be hoped.

The test as a whole

So far, we have looked at different items, sub-components and components of the trial tests, but we can also look at the tests as wholes. It is common in psychometric test analysis to look at the statistical relationship between different components of a test by calculating correlations of the total scores for all components with all other components. These correlations shed light on both the reliability of the test (high correlations suggest a statistically coherent and hence reliable test) and the nature of the different kinds of items (which sets of items are more like or unlike each other?).

The table below shows the following correlations:

- 1 reading multiple choice questions;
- 2 reading vocabulary;
- 3 reading short answer questions;
- 4 spelling;
- 5 vocabulary;
- 6 grammar and usage; and
- 7 writing.

Correlations between the sub-components of one trial test							
	1 RMCQ	2 RVOC MCQ	3 RSAQ MCQ	4 SP MCQ	5 VOC MCQ	6 GRAM MCQ	7 WRIT
1 RMCQ		0.15	0.33	0.36	0.29	0.17	0.53
2 RVOC			0.29	0.12	0.15	0.07	0.34
3 RSAQ				0.22	0.16	0.01	0.38
4 SPMCQ					0.33	0.17	0.40
5 VOCMCQ						0.11	0.23
6 GRAMMCQ							0.18
7 Writing							
Average correlation	0.30	0.22	0.23	0.26	0.23	0.13	0.34

The correlations in the table are not high, but this is partly explained by the fact that sub-components 2, 3, 4, 5 and 6 only have 5 items each. (The more items in a sub-component of a test the more reliable it is likely to be.) The correlation between the 10 reading items and the writing scores is highest at 0.53, and this may be the case because these two are the most substantial components of the test. On the other hand it might be thought that they are the most distinct and different skills in the test, and in that sense it might be expected that the correlation between reading and writing would be less than the correlations between writing and language and reading and language.

It might be thought that language would correlate more highly with both reading and writing than reading and writing would correlate with each other. One might expect, for instance, higher correlations between reading vocabulary and multiple-choice vocabulary, or between spelling and grammar. But such high correlations are not shown.

On average, reading mcq (0.30) and writing (0.34) have the highest correlations, and on average the grammar and usage sub-component has the lowest correlations (0.13). Surprisingly, the correlation of grammar with writing is the lowest at 0.18, whereas the correlation for spelling of 0.40 is significantly higher. This may be seen as suggesting that spelling ability is a better predictor of writing performance than the kind of grammar/usage tested in the items above.

The examination of the grammar items above shows that they do not correlate well with the overall tests score, and hence these particular items are not reliable in psychometric terms. These results also suggest that the kinds of skills tested in the grammar items might not relate directly to the skills of reading and writing more generally. It may be the case that the skills of reading and writing tested do not correlate very well with the kinds of knowledge tested in the grammar items.

Some preliminary conclusions

The trial tests developed and administered by the working party on benchmark testing created items and tests that generally 'worked' well psychometrically. At this early stage, it seems fair to conclude that the performance of trial candidates on reading comprehension was good. Trial candidates were also able to deal with the items that tested vocabulary, spelling and punctuation. But the performance of the trial candidates on the grammar and usage items discussed above was not satisfactory. Clearly, these items did 'not work' psychometrically, and another testing format and less difficult items will have used to test such knowledge. There is some evidence from the trial that such grammar and usage items do not relate directly to the reading and writing components of the test.

Performance on the writing tests is difficult to assess at this stage, but after the testing of a national sample in November 2003, it is planned that the Ministry will publish examples of levels of performance. These examples will be related to the writing standards presented in **The Silken Knot** developed by the Centre for Educational Research and Development. When the percentage of candidates performing at each level is published as a result of the testing programme, the writing performance of students at Grade VI in Bhutan will be there for everyone to see.

THE RELATIONSHIP BETWEEN ESTIMATION SKILL AND COMPUTATIONAL ABILITY OF STUDENTS IN YEARS 5, 7 AND 9 FOR WHOLE AND RATIONAL NUMBERS

- Phuntsho Dolma

PURPOSE OF STUDY

Learning mathematics is considered to be important and essential in every aspect of life, but learning mathematics is still a nightmare for many children in the country (Curriculum and Professional Support Division (CAPSD), 1996). For many years, the country has suffered from the poor performance of school children in mathematics. The deficiency in mathematics becomes very noticeable every year during the admission of college and university students. Very few people opt for study in mathematics. As a result, the country has remained in short supply of skilled people in important fields like education, medicines, industry and technology, which are in high demand in this sophisticated and technological world. *The advancement and perfection of mathematics are intimately connected with the prosperity of the state*, said Napoleon Bonaparte as quoted by Usiskin (1986).

According to the current situation, around 60% or more students end up in odd jobs and training, as they are not qualified to go for further studies due to the low percentage of marks. One of the main factors that pull their overall average marks down is their score in mathematics. *If not treated well, mathematics is considered to be the worst curricular villain in driving students to failure in school* (National Council Teachers of Mathematics (NCTM), 1989). All the concerned people and the authorities in the country are aware of this situation but they seem to be really trapped in a kind of vicious circle as shown in Figure 1.

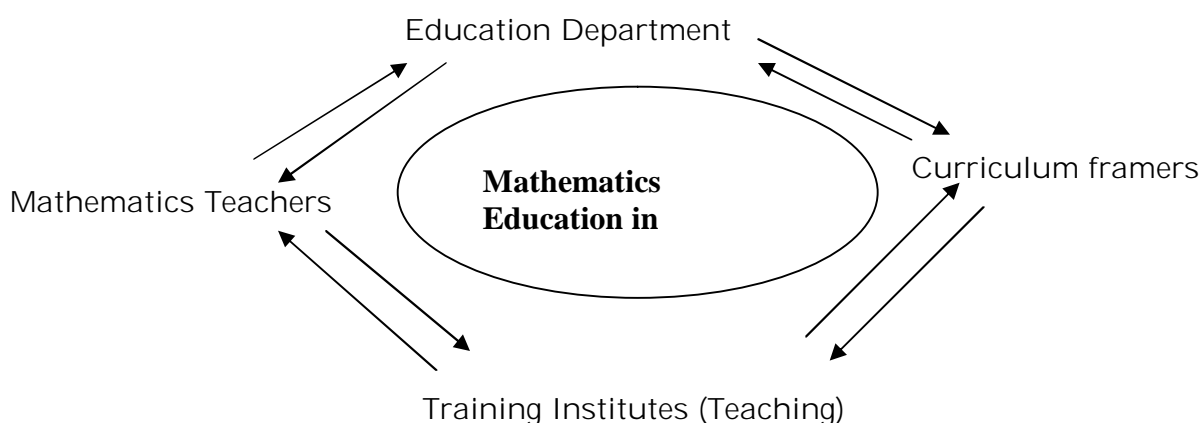


Figure 1: Circle of blame in mathematics education in Bhutan

It has become very difficult to pinpoint the black spot directly to one particular person or a body; rather every one starts blaming each other for the situation. The

Education Department points the finger at mathematics teachers for not doing their job properly, whereas the teachers blame curriculum framers for producing a very bulky syllabus. In the same way, curriculum framers blame the training institutes for not training the teachers efficiently, whereas the training institutes blame the education department for not setting good criteria for the selection of mathematics teachers, and so on. Whatever may be the cause, it is high time to break the vicious circle somewhere and start looking for the factors which contribute to low performance in learning mathematics and try to address them accordingly.

There could be many reasons for the low performance in mathematics. One of the reasons could be the lack of a strong foundation in learning the subject. As per my own experience as a mathematics teacher-educator and according to research findings, one of the reasons for the weak foundation in mathematics appears to be the failure of students in making sense of computation. May be, we, as teachers, fail to make sense in teaching and learning mathematics, particularly while dealing with basic topics like whole and rational numbers (fractions, decimals, ratio and percentage).

It seems so, because most of the children seem to face difficulties while computing mathematical problems related to these topics. It appears difficult to many of them, as they often cannot make any sense of what they do. As such, it affects children's performance tremendously and thus it leads to failure when they reach higher grades. Similarly, the situation appears to be same in other countries too.

For instance, in a study carried out by Leutzinger and Berthean (1989), it is said that often students' mathematical knowledge is superficial and leads to misconceptions about numbers (Leutzinger and Berthean, 1989). Some of their findings in the classrooms are listed below:

- Seventeen out of twenty students in a fourth grade class responded that $\frac{1}{2}$ is the largest fraction less than 1;
- Sixty five percent of class of sixth grade students selected 0.39 as a decimal that is larger than 0.6; and
- A third grade student adamantly argued that 20 is closer to 90 than to 5. (p. 5)

According to the above findings, many children do not seem to possess any sense of numbers. Lacking that, it hampers their being able to work flexibly with numbers and give reasons with numerical information. As such, children fail to appreciate mathematics as a tool for solving problems and interpreting events (Ritchhart, 1994). Besides, having a strong sense of numbers can help them to possess a comfortable approach to solving mathematical problems with understanding. One can be in a position to make decisions about what tools and methods to choose for calculating and judge the reasonableness of their results (Jones, Kershaw and Sparrow, 1994).

In several findings, it is well argued that computing mathematical problems without understanding is one of the main concerns of mathematics education today. Many mathematics educators have considered this and come out with several ideas and methods to make learning mathematics more meaningful and useful to learners. Among many key ideas, I strongly feel that estimation skills

could be one of the solutions as it has a capacity to ensure whether a computed solution/answer is reasonable or not. As pointed out by Miller (1993):

For many situations, an estimate is all that is really needed. It appears, however, that little attention is being given to these important skills since national assessment tests continue to show that an alarming number of students are deficient in these areas. (p. 1)

Having the ability to estimate can help students achieve very important goals (value mathematics, be a confident problem solver, communicate mathematically, and learn to reason) in learning mathematics. For instance, being able to reason and communicate better mathematically improves students' confidence. For that, children come to value mathematics as a distinct way of thinking, instead of viewing it as a collection of unconnected rules and formulas (Micklo, 1999). The same point is well argued by Usiskin (1986, p. 2) who said:

Estimating is often more reasonable than avoiding estimates, and estimating is often the only choice one has in a situation. Furthermore, the uses of estimation fit the ideals of mathematics, namely, clarity in thinking and discourse, facility in dealing with problems, and consistency in the application of procedures.

Estimation is also like mental computation, which brings a dynamic quality to learning mathematics and helps students broaden their view of mathematics (Rathmell and Trafton, 1990). Moreover, as suggested by Reys (1992, p. 142), "over 80% of all mathematical applications call for estimation, rather than exact computation". Not only that, in today's society, changes in technology have made estimation skills more important than ever in the development of mathematical power (NCTM, 1993). For instance, the use of computing technology (e.g. calculators) now puts a high demand on estimation techniques for verifying the reasonableness of computations (Levin, 1981). As such, I strongly agree with what was argued by Carlow (1986, p. 94), "without a well-developed sense of mathematical facts and relationships, students have no way to judge the reasonableness of numerical output from a computer".

Moreover, as pointed by Edwards (1984, p. 61), "you cannot use the calculator to find answers until you have some idea of what answers you are looking for". As such, estimation skill is not only useful to perform computation without any external aids but also useful for checking the results of the calculation (Levin, 1981).

Therefore, in real life, problems and situations more often involve estimation than precise measurement or calculation (Harte and Glover, 1993).

To support this point, Poulter and Haylock (1988, p. 27) state "computational estimation and the ability to judge the reasonableness of results as basic goals for the teaching of mathematics". As such, my main aim in this research project was to find out the place of estimation in improving the quality of learning mathematics. In order to do this, I have carried out investigation on how the relationship between estimation skill and computation ability can help in solving mathematical problems with understanding.

According to what had been discussed earlier, there was a great need for a kind of study, which would help improve teaching and learning mathematics with understanding. As suggested by Swan (1991), one of the widely accepted purposes of mathematics education is that of preparing students to solve problems that they will encounter in the real world. Swan raised an important question, (1991, p. 1): "Are students being provided with the skills they will use in the real world?" Answering such a question leads mathematics educators to the main concern in teaching and learning mathematics, which is to help the children in exploring meaningful ways to compute, rather than memorising algorithms (Sowder and Schappelle, 1994). As such, estimation is stressed to be one of the skills which involves comprehending the problem, judging and verifying reasonableness and thus helping learn mathematics meaningfully (Harte and Glover, 1993).

Hence, it is a concern for all the mathematics educators and it leads to one of the major reasons for teaching estimations (Trafton, 1986). As it is, knowing how to estimate is one of the important skills that can help children solve problems with understanding as supported by Van de walle (1988, p. 15) who stated that:

An important by-product of learning to estimate is better conceptual understanding, and conversely – concepts must be understood in order to provide the flexible set of processes and decision-making rules needed by the proficient estimator.

Not only that, as Reys (1988, p. 29) has pointed out, "one of the exciting benefits of teaching estimation is the opportunities it provides for individual thinking to occur". Therefore, I strongly support what Reys had to say on estimation that "estimation skills are essential and must be given high priority within every school programme...only a few mathematical topics provide the wealth of benefits both immediate as well as long-term as does estimation" (1988, p. 41). In spite of that, estimation is a crucial mathematical strategy that can be woven into the entire mathematics curriculum (Whiten, 1994).

Despite all the importance of estimation as discussed above, the reality is that very little attention is actually paid by mathematics teachers to the development of this skill in their pupils (Cockroft Report in Poulter and Haylock, 1988). So, in order to highlight it and find out its effectiveness, this current study had been carried out to investigate the relationship between the estimation skill and computational ability of students in Years 5, 7 and 9 in relation to whole and rational numbers. The reason for choosing those topics was as per the argument made by Poulter and Haylock (1988, p. 28) that "to be a good estimator the student will need to have developed confidence and flexibility in handling numbers and number relationships". As suggested by Carlow (1986, p. 98), "estimating forms a powerful means of enriching the understanding of number and operations on numbers".

The point is very well argued by Showell (1976, p. 25): "the child who has insufficient understanding of the basic concepts is going to find the subject difficult when he gets to his secondary school". Besides that, the emphasis on estimation particularly for the chosen topics is designed to help students understand the relationship between whole number and decimal fractions so that they would face fewer problems while dealing with other topics at a later stage (Reys, Reys, Nohda, Ishida, Yoshikawa and Shimizu, 1991).

As such, the time given to teaching estimation in these topics would help children become more adept at reasoning with numbers, more flexible in thinking, more aware of the relationship between different operations and develop a greater feel for number (Poulter and Haylock, 1988). It is observed that "time spent developing these basic concepts through an estimation approach greatly enhances, and gives meaning to later work with exact computation" (Reys, 1986, p. 33). It is also believed that computational estimation and general mathematical thinking are highly related in terms of deciding what answer is needed, using mental flexibility, recognising multiple solutions, picking one strategy in favour of another, and checking for reasonableness of results (Reys, 1985).

Moreover, there is evidence found by Yang (1995, p. 38), that "skill in computational estimation is associated with the flexibility of using and understanding the structure of number system and operations". As such, there is a need for study of estimation integrated with the study of concepts underlying whole and rational numbers so that these concepts can be constructed meaningful by the learners (Reys and Reys, 1990).

A problem in teaching and learning mathematics

As discussed earlier, one of the main problems in learning mathematics is solving problems with understanding. For too long, many children have been computing mathematics problems without any in-depth conceptual knowledge. In fact, in many mathematics curricula, the importance was placed more on speed and accuracy of computation than on meaning (Bana and Bourgeois, 1976). Computation was mostly carried out with a few rote-learned algorithmic steps. Young children were being presented with a mathematics problem in which the arithmetic computation is given more importance than conceptualization of mathematics. Hence, learning mathematics tends to be geared more to arithmetic than mathematics as pointed out by Wolfinger (1988, p. 4):

A sound program dealing with quantitative aspect of the school program for young children should emphasize mathematics rather than arithmetic, should develop understanding rather than answers, and should generate concepts rather than folders of completed worksheets.

Owing to that, the children end up getting the correct answer but often without it meaning anything to them. As such, learning mathematics often remained as something meaningless and not concerned with the development of concepts. Rather, it became more of selling the information and not at all understanding it (Cole, 1987 as cited in Ritchhart, 1994).

Therefore, the issue of learning mathematics tended to be more with being able to solve the mathematical problems but not being able to think mathematically. This was due to the type of curriculum that lacks in providing students with skills to solve problems encountered in the real world (Swan, 1991). Hence, it results in students' failure to recognize when answers are not sensible.

Significance of the Study

This is an "ice-breaking," exploratory study that is seen as the first of many to be undertaken for the benefit of mathematics education in Bhutan. The findings of the

study are expected to contribute to the wider sphere of teaching and learning mathematics and particularly to the chosen topics in the following ways, by being able to:

- identify the relationship between estimation skills and computational ability;
- identify the importance of estimation skills in computing mathematical problems related to whole and rational numbers;
- raise awareness of the importance of estimation in computing mathematical problems (numbers) to the mathematics teachers in schools, educators in training institutes and curriculum officers in Curriculum and

rofessional

Support Division (CAPSD) in Bhutan; and

- suggest opportunities for all the children to carry out meaningful computation of mathematical problems.

The teachers in school need to be made aware of the importance of estimation before they blindly apply computation skills to the children. Once they are convinced, they should be able to implement it in their lessons. It should be integrated in every topic rather than taught separately, so that estimation can be applied to almost all the mathematical topics. It is suggested by Reys (1986, p. 31) that:

Estimation, much like problem solving, calls on a variety of skills and is developed and improved over a long period of time... It is not a topic that can be isolated within a single unit of instruction... To be effectively developed, it must be nurtured and encouraged throughout the study of mathematics.

In order to do this, the teachers should be in a position to incorporate estimation activities into all areas of the programme on a regular and sustainable basis so that the children can make use of the skills to pose and select alternatives to assess a reasonable answer (NCTM, 1980). It is also pointed out by Clarke, Lovitt and Stephens (1990, p. 175) that "estimation tasks, if carefully introduced by teachers, are one way of breaking down students' fear of failure in mathematics".

As pointed out by Trafton, (1986, p. 16):

Computational estimation is one of the most powerful and useful aspects of estimation, and building a strong computational estimation strand into school mathematics programs must be a top priority for curriculum developers in the near future.

In doing this, one should remember that the main purpose of introducing a systematic estimation programme is not to do away with the routines and the analyses of existing mathematics programmes. Instead, it is to build a combined linear/analytic and intuitive/holistic approach, which can support the details with a strong informal background of awareness and understanding (Carlow, 1986).

The ultimate but very important expectation of this study is to help the children compute mathematical problems with understanding. For this, they will need to have some skills in estimation. With an idea of estimation, the children are

expected to understand the problem and lead to better solutions. It is also predicted that students who are good at estimations are normally confident in their mathematical ability and more likely to attribute success to ability (Sowder, 1992). Therefore, what has always been at the back of the researcher's mind is that the skills and knowledge gained in this research process will be used as a torch in highlighting the teaching and learning mathematics to all the teacher-trainees, school teachers and the curriculum officers in Bhutan.

Aim of Study

The aim of this study is to investigate the relationship between students' computational ability and estimation skill while dealing with whole and rational numbers. More specifically, I have explored the following:

- use of estimation in measuring the understanding of mathematical problems;
- estimation skills used in computing whole and rational numbers;
- estimation skills possessed by students in Years 5, 7 and 9;
- development of estimation and computational abilities with age;
- difference in performance among the chosen topics; and
- gender differences in estimation and computational abilities.

There are two main reasons for choosing these year levels (5, 7 and 9). First, to represent each of the school levels (primary and secondary). Years 5 and 7 represent primary schools, and Year 9 secondary schools. Second, the idea is based on the previous research in *Mental Computation in School Mathematics: Preference, Attitude and Performance of Students in Years 3, 5, 7 and 9* by McIntosh, Bana and Farrell (1995), and *Number Sense in School Mathematics: Student Performance in Four Countries* by McIntosh, Reys, Reys, Bana and Farrell (1997) and *Number Sense Performance and Strategies Possessed by Sixth and Eighth Grade Students in Taiwan* by Yang (1995).

Research Questions

Related to above aims, the research questions are divided in two parts: Primary part, with one main question and the secondary part with four sub-questions. The data collected are expected to answer these questions accordingly.

Primary question:

What is the relationship between the estimation skill and computation ability of students in Years 5, 7 and 9 for whole and rational numbers?

Secondary questions:

- What is the correlation between computation and estimation skills in Year 5, 7, and 9?
- What development is there in computational ability and estimation skill over Years 5, 7 and 9?
- How are performances in computation and estimation related to one another in each of the topics (whole numbers, fractions, decimals, percentage and ratios)?
- What disparities are there between estimation skills and computational ability?
- Are there any genders differences in performing estimation and computation?

As a whole, the main intention of my study is not concerned with how fast children can compute a mathematical problem but how they make sense out of computation. Having said that, I wanted to find out whether estimation skills could help children compute mathematical problems of the chosen topics effectively and meaningfully.

The study also covers the importance of estimation and computation and their relationship to number sense. The idea behind including number sense is to show its importance in learning mathematics with understanding. So, in order to implant a strong sense of number in children, basic skills of computational estimation are urgently required. As is clearly pointed out by Edwards (1984, p. 60), "the justification for teaching computational estimation lies in the need to develop "number sense".

What is Estimation?

According to Micklo (1999, p. 142), estimation is nothing more than quickly and reasonably developing an idea about the quantity or size of something without actually counting or measuring it. To be more precise, estimating as per Lang (2001, p. 462) "is the process of thinking about a 'how many' or 'how much' problem and possible solutions". As such, Micklo (1999) has concluded that estimation is a method of thinking that is used to solve real problems, rather than a wild guess. He has also pointed out that "to make a guess you do not have to think about how many there are. Any number can be a guess. To make an estimate you have to think" (p. 142).

Importance of Estimation in Learning Mathematics

Estimation is more or less recognised as one of the important parts of learning mathematics. Estimation is used widely in day-to-day life activities. There are not many events where estimation is not implemented. In fact, it is representative of the type of mathematical skill that is widely applied by adults in daily life situations and thus likely to represent a general outcome of school mathematics curricula (Foegen and Deno, 2001).

Not only that, according to Reys (1992), it is noted that "estimation is a basic skill, and its growing importance in a technological society is recognised. It is used much more than exact computation" (p. 281). The same point is given much importance by the National Research Council (1989), which stated "in today's society, changes in technology have made estimation skills more important than ever in the development of mathematical power", cited in (Gulley, 1998, p. 324).

Similarly, Usiskin (1986, p. 9) argues that:

...even with calculators and computers taking the work out of computation, estimating may make things a lot easier with no important loss in the quality of the answers. In fact, answers derived using suitable estimates may be more reasonable and more realistic than those that attempt to be exact.

Thus, the greatest reward of an extensive estimating programme can be the greatly enriched preparation for meaningful learning (Carlow, 1986). As such, it is very important that the children should be exposed to skills like these so that in devising their estimates, students have gained enough to develop sound problem-solving and sense-making skills. As said by Woodcock (1986, p. 115), "it is very important for students to learn to estimate so they will spot careless errors and be able to answer the critical question, 'is my answer reasonable?'" Moreover, according to May (1994, p. 24):

It is difficult to imagine anyone functioning effectively in the real world without being able to estimate measurements. How high is it? How much does it weigh? How long will it take? Questions like these are asked in all kinds of everyday situations.

Despite that, the teaching of estimation is a relatively recent phenomenon in the long history of mathematics education (Hanson and Hogan, 2000). Until recently, curriculum developers have not given much importance to estimation skills. In fact, it is noted that estimation is one of the most neglected skills in the mathematics curriculum (Carpenter, Coburn, Reys and Wilson, 1976). As such, the topic has not received as much attention as other mathematical skills and abilities, although people make use of it without being aware of it. Only lately is its importance gaining recognition in the world of mathematics. Many of the mathematics educators have been struggling to bring this topic into the limelight, and thus more research is being undertaken.

Till now, in many schools, learning mathematics is always taken as not something for their life but as a burden for them especially in getting promoted to the next grade, level or whatever. As pointed out by Micklo (1999, p. 142), "estimation, therefore, needs to be integrated into the entire mathematics curriculum, and not be taught as stand-alone concepts". The same point is strongly supported by Harte and Glover (1993, p. 76):

Estimation can be integrated into any mathematics content and bridged into any curriculum area with a little creative planning. Students quickly become much more aware of mathematical relationships and more sophisticated in their thinking.

Many people seem to view estimation as somehow foreign to the mainstream of mathematics and overlook the skills of estimation. They tend to think that there is no reason to estimate when they can work out the answer exactly. However, I would like to differ on this opinion and agree with Usiskin (1986, p. 3) who has listed that estimation is necessary when:

- an exact value is known but for some reason an estimate is used (e.g., the estimate 1.732 for a square root of 3);
- an exact value is possible but is not known and an estimate is used (e.g., the age of an old sequoia tree before it is chopped down); and
- an exact value is impossible (e.g. the estimated life of a bulb).

As indicated above, there are hardly any activities in life, where the concept of estimation is not involved. In fact, our daily lives are filled with situations that require estimation. For instance, in comparing prices at a store, changing the amounts of ingredients used in a recipe, determining the best routes when driving,

and verifying calculator computations (Micklo, 1999). Moreover, as McIntosh (1992) has suggested, over 80% of all mathematical applications use estimation instead of exact computation.

Being able to estimate and decide the type of answer needed for a problem is an important part of mathematical thinking as argued by Reys (1985, p. 41):

Every component of estimation-deciding on the type of answer required, choosing and carrying out appropriate strategies, and checking reasonableness of the answer-reflects the kind of high level thinking that is associated with problem solving and mathematical thinking.

Furthermore, as said by Usiskin (1986, p. 2), " the uses of estimation fit the ideals of mathematics, namely, clarity in thinking and discourse, facility in dealing with problems, and consistency in the application of procedures". As such, they fail to understand and solve the mathematical problem meaningfully and effectively. According to the National Council of Teachers of Mathematics (1989), there are five goals for students in learning mathematics. They are as follows:

- value mathematics;
- become confident in their ability;
- become a math solver;
- learn to communicate mathematically; and
- learn to reason.

Having the ability to estimate can help students reach all these goals in learning mathematics. Knowing when and how to estimate provides students with tools and strategies to solve problems. Being able to reason and communicate mathematically improves students' confidence. Having these qualities would help them to value mathematics as a distinct way of thinking and not as a collection of unconnected rules and formulas (Micklo, 1999). To add to this, Trafton (1978, pp. 199-200) has summarised a version of those goals into three important points of how estimation contributes to the mathematics curriculum as it

- can bring a new dimension and vitality to the study of computation;
- enhances the development of qualitative thinking; and
- develops problem-solving skills.

Therefore, a need for that is mainly because estimation is crucial to becoming a good problem-solver. Being able to solve problems successfully in life is one of the key aims of mathematical education.

Status of Computation in the Current Curricula

Computation has long been the driving force of the school mathematics curriculum at all levels and is often viewed as the key purpose for learning mathematics (Rathmell and Trafton, 1990). It is thought to be a kind of method/procedure followed in order to solve a particular problem. Hence, many individuals believe that the word computation means using paper and pencil algorithms, a set series of written steps to get the correct answer. As such, people are made to believe that mathematics is about getting right answers rather than

about clear creative thinking (Payne, 1990). In fact, Payne has also stated that “the rules and procedures of mathematics are too often learned without any real understanding”(p. 2). However, as pointed out by Rathmell et al (1990, p. 171):

Curricular demands no longer permit teaching with minimal understanding...procedures that children have memorised without understanding do not further the development of number sense, the ability to judge the reasonableness of results, a flexibility in thinking with numbers, or a comprehensive view of computation.

Similarly, Hamrick and William (1978) support the concept that learning the process of computation combined with the skills of estimation and approximation is useful in terms of readiness for future learning. Moreover, according to Coburn (1989), “the role of computation in the mathematics curriculum is to furnish the individual with useful skills and to facilitate further learning in both mathematics and related disciplines” (pp. 52-53). Jones, Kershaw, and Sparrow (1994) support the same point:

Children must be allowed to decide what computational methods meet the demands of the tasks in which they are engaged. This means that children must feel confident in using a range of methods (such as the calculator, computer, and paper and pencil). The teacher's responsibility is to provide suitable mathematical experiences, which offer children choice and support personal inventiveness. (p. 56)

As such, one of the primary understandings in computation involves knowing which operation to perform and deciding which calculator button to push. Side by side, a child should be taught to check whether the computed answer is reasonable or not. Having to do this requires more thinking than what is needed for the rote manipulations of paper and pencil algorithms (Coburn, 1989). Likewise, Swan and Bana (1998, p. 580) argues that:

When faced with a mathematical problem, a person must at some point determine whether or not a calculation is required. Given that calculation is required, the problem solver must then determine whether an exact or only an approximate answer is needed.

An approximation or estimate is needed here as the part of the process of finding answers, since estimating is a valuable way of checking the computation (Rathmell and Trafton, 1990). Thus, the problem-solver should be able to decide accordingly and proceed further in solving the given problem appropriately. As argued by Rathmell et al (1990, p. 171), “decisions about computing encourage reflection on the problem and the computation involved”. As such, children should be provided with an opportunity to decide what computational methods meet the demands of the tasks in which they are engaged. This means that children should feel confident in using a range of methods and tools (Jones, Kershaw and Sparrow, 1994).

A model of the computation process is given in Figure 2.

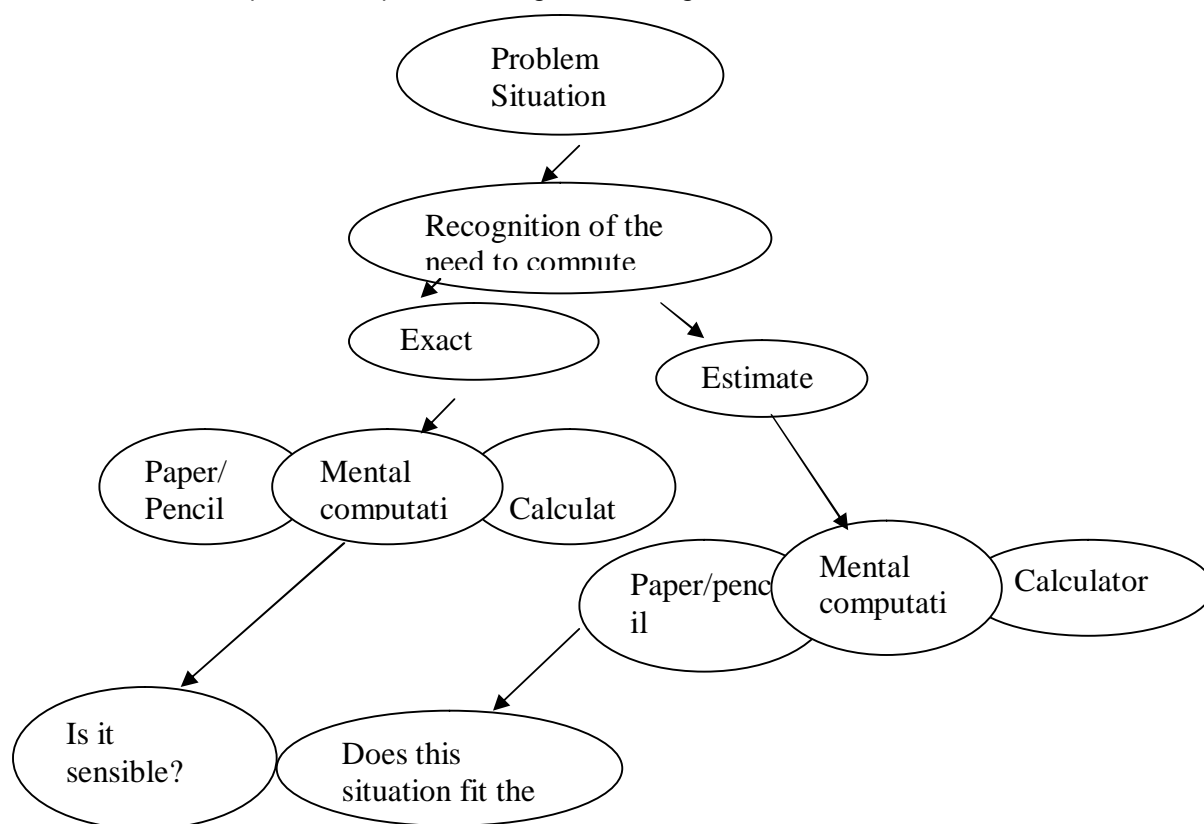


Figure: 2 An overview of computation (NCTM, 1989) cited in Rathmell and Trafton (1990, p. 153)

As given in Figure 2, the study of computation should promote a meaningful and understanding range of learning in the world of mathematics. Hence, the thrust of current curriculum reform should not reduce the importance of computation but rather it should broaden the concept of computation and encourage the importance of problem-solving (Coburn, 1989). Thus, it should be able to make children active participants in creating knowledge rather than becoming passive receivers of rules and procedures. Doing that implants in children a belief that learning mathematics is a sense-making experience (National Research Council, 1989).

Number Sense in Learning Mathematics

One of the key objectives of the elementary school mathematics curriculum is to instil in students a basic understanding of the number system (Leutinger and Berthean, 1989). In simple terms, number sense means sense-making of mathematics (McIntosh, Reys, Reys, Bana, and Farrell, 1997). It involves the formation of relationships between numbers and an understanding of their relative magnitudes. Children who have acquired a good number sense should have understood number meanings, developed many relationships among numbers, recognised the relative magnitudes and the relative effects of operations on

numbers. It is rather the theme of learning mathematics as a sense-making activity (NCTM, 1989).

Similarly, Reys and Yang (1998, p. 226) support that "number sense refers to a person's general understanding of number and operations". For example, as suggested by Sowder (1992), Greenes, Schulman and Spungin (1993), and Ritchhart (1994), children should be able to recognise that:

- six is simultaneously half a dozen, four less than ten;
- the difference between 5 and 9 is the same as the difference between 635 and 639;
- 1000 marbles wouldn't fit in the jam jar - the reasonableness of the magnitude of the number in relation to the context;
- items costing 85c and \$1.05 respectively are each close to \$1 and so the total will be about \$2.00 using estimation to check reasonableness of result; and
- $73 - 29$ will produce the same results as $74 - 30$, that is, when a "1" was added to 73, it also had to be added to 29 to maintain the same difference between the number-number relationship.

As such, number sense exhibits itself in various ways as the learner engages in mathematical thinking, including awareness of various levels of accuracy and sensitivity to the reasonableness of computations (McIntosh, Reys, Reys, Bana, and Farrell, 1997). Making children understand numbers is very important if they are to make sense of the ways numbers are used in their everyday world (NCTM, 1989). Therefore, one of the most important tasks for mathematics teachers would be to help the learners to achieve a good number sense so that they can have a strong foundation in learning mathematics as a whole.

Estimation and Number Sense

My understanding of estimation is that one can estimate only if one can make sense of the mathematical problem presented. As Schoen, Bean, and Ziebarth (1996, p. vii) point out, "estimating aids in concept development, but at the same time a solid conceptual understanding improves one's ability to make good estimates". An important by-product of learning to estimate is better conceptual understanding (Schoen et al., 1996). As pointed out by Rathmell and Trafton (1990, p. 156), "estimations help children develop confidence in their ability to reason with numbers and provide a base for making judgements about the reasonableness of results". That can be done either with pencil and paper, or on a calculator (Ritchhart, 1994).

Likewise, children rich in number sense can engage in any form of computation successfully as they would be able to understand the problem and carry out the process using the right kind of method accordingly. Many reports and studies (Burton, 1993; Case, 1989; Edwards, 1984; Greenness, Schulman and Spungin, 1993; Greenness, 1991; Greenos, 1989; Hiebert, 1989; Markovits and Sowder, 1994; Macintosh, Reys, and Reys, 1992; National Council of Teachers of Mathematics, 1989; Resnicks, 1989; Reys et al., 1991; Sowder, 1989, 1992a;

1992b; Treffers, 1991; Van de Walle and Watkins, 1993) are cited in Yang (1995, p. 6), who state that:

Computational estimation plays an important role in the development of number sense. Pooring (weakness) in performance of computational estimation may reveal a lack of number sense.

The lack of number sense tends to present insurmountable barriers to learning mathematics. For instance, if a child fails to understand that 1.50 is a representation of 1.5 and $\frac{3}{4}$ is less than 1, then that particular child will have to remember a host of rules in order to deal practically with everyday numerical situations. Owing to the above-mentioned points, for many children, learning of mathematics appears to offer no other way than to learn it by rote. For them, it is something that is needed only to get the required answers or marks to get through the examination.

One of the main problems, which could be foreseen here, is lack of making sense of what students do or learn. For example, in one of my lessons (Year 5), I gave an activity on addition of whole numbers ($234 + 456$) and asked them to estimate the answer without using pen and paper. To my surprise, the answer given was 6810. I realised immediately that the children could remember vaguely some procedure for solving the problem mechanically using the standard algorithm but lacked number sense, as they were not able to judge whether the number they added was worth a thousand or not. Such an example demonstrates that many children are not used to working with numbers and relationships but with digits (Hope, 1986). As such, Carpenter and his colleagues (1976) cited in Sowder (1992, p. 381) concluded, "before students can estimate well, they must develop a quantitative intuition (number sense), a feel for quantities represented by numbers".

Similarly, findings of Macintosh, Reys, and Reys (1997, p. 73) stated that in estimating 24×0.98 from the choices "more than 24", "less than 24", and "impossible to tell without working it out", over sixty percent of grade eight students incorrectly responded to this question. Another example is when 13-year-old children in the U.S. were asked to estimate the sum of $\frac{12}{13}$ and $\frac{7}{8}$, given the choices of 1, 2, 19, 21, and "I don't know", over fifty percent incorrectly answered 19 or 21 (Carpenter, Corbitt, Kepner, Lindquist and Reys, 1980; McIntosh, Reys, Reys, Bana and Farrell, 1997).

The findings stated above clearly reveal children's lack of understanding of number sense, operations and computations. As such, a lack of number sense could be one of the main reasons for children lacking a clear visualization of mathematical problems and the application of estimations. It is so because students are more often encouraged to follow and memorize the rules and symbols rather than making sense of the numerical situations (Yang, 1995). In order to break this prevailing notion of students, many mathematics educators have undertaken research and have come out with numerous evidences of how estimation plays an important role in the development of number sense (Campbell and Clements, 1990).

The point is well supported by Poulter and Haylock (1988, p. 28), who stated that:

Time given to teaching estimation will pay considerable dividend. Not only do pupils acquire genuinely useful skills particularly if estimation is taught in applied contexts but also in our experience they become more adept at reasoning with numbers, more flexible in their thinking, more aware of the relationship between different operations and generally develop a greater feel for number.

Thus, students' number sense is enhanced when they are encouraged to use numbers in real life situations and are forced to estimate quantities in different mathematical settings (Welchman, 1999). The same point is very well supported by Lang (2001) that by offering rich opportunities in estimating number, varying the contexts, and using appropriate questioning techniques, teachers can help children develop the foundation necessary to build a better number sense. As such, the practice of estimating is a useful subsidiary skill for developing number competence and confidence (Duffin, 1999).

Number Sense and Computation

Ever since I started teaching mathematics in schools, I have always come across children who could solve mathematical problems mechanically using standard algorithms but could not explain why or how if someone asked them. The only possible explanations the children could give were:

- *I checked the answers given at the back of the textbook;*
- *I followed examples given by the teacher; or*
- *My teacher told me to do it this way.*

The above statements reveal that children are always exposed to a mechanical kind of learning where they fail to get the real meaning of what they do in the mathematics classroom. Instead, they seem to be blindly guided by mathematical terms and rules without any understanding about what it actually means. For example, a bus holds 22 children, how many buses are needed to take 121 children for a picnic? A common answer is $5\frac{1}{2}$, which is not applicable in a real situation like the one mentioned above. Therefore, computation involves not only applying arithmetic rules but also considering the context in which the numbers are being used (Ritchhart, 1994). Similarly, Sowder (1988, p. 227) has pointed out that "students should not only learn how to calculate an exact answer, but develop a better understanding of number meanings and understanding relationships between numbers and operations".

Unfortunately, in the current practice, many children are led to rely solely on procedures and cannot themselves judge whether their answers are reasonable or not. Perhaps, this is because of certain situations as pointed out by Ritchhart, (1994, p. 5):

In many classrooms, students are not given the opportunity to construct their own meaning based on personal experiences. Much of students' early work in mathematics concentrates on developing computational skills rather than on rich activities that teaches them.

As such, children are left in the dark without knowing where they are heading and what they have done and why they have done it. It is like a person with weak arms

trying to climb over a cliff. In other words, 'cliff' represents the world of mathematics and 'weak arms' refers to learning mechanically using standard algorithms. It is so because at any time there is a chance of misleading them to wrong concepts of mathematics as they lack a strong foundation of number sense. It is like having weak arms and not being able to grasp the cliff firmly.

The same point is also stressed by Swan (1990, p. 70), as "the facts and skills that are taught mechanically using traditional approaches are often quickly forgotten precisely because there is no conceptual foundation." It could be so, as "the knowledge of rote procedures interferes with students' attempts to construct meaningful algorithms" (Mack cited in Yang, 1995, p. 30). Thus, much of the current attention on developing number sense is a reaction to over-emphasis on computational procedures that are often algorithmic and lack number sense (Reys and Yang, 1998). The following quotation from Jones, Kershaw, and Sparrow (1994) indicates the difference between computational estimation with and without number sense:

Consider the problem of finding the difference between 1.9 and 3.6. A child who demonstrated number sense ability said that the solution would be about 1.5. She mentally made the 1.9 up to 2.0, said the difference was now 1.6, added on the 0.1 and gave an answer of 1.7. Another child when presented with the same problem said she had a mental picture of the 1.9 sitting below the 3.6 with the decimal points lined up. She then proceeded to explain how she had used the decomposition method of subtraction to arrive at a solution of 1.7. Both girls provided a correct solution but the second girl did not show as flexible an understanding of numbers and their relationships as evidenced by her method of checking her answer. (pp. 29-30)

The way in which the first girl solved the problem illustrates how number sense and estimation were used together, quickly and successfully. Such a formal and rigid kind of procedure, as used by the second girl above, suggests that children are enslaved by a technique and never exposed to any other alternative methods of solution. Robitaille (in Hope, 1986, p. 50) reported similar conclusions about the apparent inability of students to reason with numbers:

Although students perform satisfactorily on computational skill items, results are weaker in areas involving what might be termed 'numeracy'. Computation is seen by most children and adults as a way of getting a correct answer, whether the answer makes sense or not is of little concern to the majority of users. (p. 2)

Likewise, there is a lot of evidence which says that students with excellent results on traditional paper and pencil tests can also show surprising weakness in number sense (Ekenstam and Greger, 1982; Sowder, 1992; Yang, 1995). Hence, it is very important that children are allowed to use their knowledge of number sense and invent algorithms to arrive at quick and accurate solutions (Hope, 1986).

Computation and Estimation

There seems to be much controversy over computation and estimation and their importance in teaching and learning mathematics. To date, most people believe

that mathematics means calculation and getting an exact answer to a given problem. As such, it leads them to believe that estimation is a weak sister to exact computation. In fact, estimation is quite often considered to be the stronger sister (Usiskin, 1986). He also stressed that obsession with exact answers leads children to make unnecessary calculations and keeps them from gaining experience and confidence in estimation judgements. Such an idea can also kill intuition and reinforce the false notion that exactness is always to be preferred to estimation.

Therefore, the idea of estimations should be adopted formally to enable children to have the opportunity to use their skills in approaching mathematical problems to compute successfully. Moreover, since the emphasis in teaching mathematics is more towards the understanding of the underlying structure of the operations, the teaching of estimation skills becomes even more important in the process of computation (Poulter and Haylock, 1988).

As Trafton (in McIntosh, De Nardi and Swan 1994, p. 83) has pointed out:

Estimation, mental computation, and calculators need to be accepted as legitimate computational methods. Students often feel that the estimations and mental-computation strategies they develop on their own must be kept from teachers because their use would not be considered "proper".

Moreover, some findings show that being good at estimation can make computation easier as a person would be in a position to change the numbers in some way to make calculations easier. Such research evidence suggests that developing skills in estimation prior to paper and pencil computation is both effective and powerful. Moreover, simple cases of estimation with a particular operation precede related written computational procedures for obtaining exact answers. In the process, there is a chance for the students to acquire more of a number sense prior to the use of formal written computation (Coburn, 1989).

Having said that, it is a must for the children to be made aware of the importance of estimation so that they are able to decide on their own the methods, tools to choose for calculating, and to judge the reasonableness of their results. As Miller (1993, p.1) has mentioned "students should be able to make a quick mental estimate to decide whether a written or calculator answer is reasonable".

Design of the Study

Methods adopted for this study were both quantitative and qualitative. Quantitative methods were used for the group-administered tests conducted with four selected schools in the Metropolitan area of Perth. The four schools comprised of a high school and three primary (feeder) schools. The three primary schools served as feeders to the selected high school. The reason for selecting a secondary school together of its major "feeder" primary schools (K-7) was to enable more meaningful between-year comparison to be made (Mcintosh, Bana and Farrell, 1995). Moreover, there can be a continuation of the smooth flow of the standard of Years 5 and 7 from the primary school to Year 9 in secondary school, as the year levels selected for this study were 5, 7 and 9. Within each selected primary school, one class each was randomly selected at each of the year levels 5 and 7. Students

in all classes were heterogeneously grouped, as is the custom in most Australian primary schools (Mcintosh, et. al.). In the secondary school where students were streamed on ability, as is case in many Australian secondary schools, stratified sampling was used to select three classes of Year 9 roughly representing students from those associated primary schools selected for the study. The total numbers of subjects involved were 91, 77 and 73 in Years 5, 7 and 9 respectively. More information on this is given in Table 2.

Table 2: Number of students tested in each year level and school

School	Year 5	Year 7	Year 9	Total
High School	NA	NA	73	73
Primary School A	32	25	NA	57
Primary School B	29	24	NA	53
Primary School C	30	28	NA	58
Total	91	77	73	241

The group-administered tests included two parallel sets of items but in different forms. They are estimation and computation containing the same items. The number of questions differed in each of the year levels as per the topic coverage and student abilities.

Table 3: Examples of matching estimation and computation items

Estimation	Computation
Without calculating the exact answer, circle the best estimate for: $\frac{5}{6} + \frac{8}{9}$ $\frac{5}{6} + \frac{8}{9}$ a. 1 b. 2 c. 13 d. 15	Calculate:
Without calculating the exact answer, circle the best estimate for: 29×0.98 29×0.98 a. A little less than 29 b. A little more than 29 c. A lot less than 29 d. A lot more than 29	Calculate:
Without calculating the exact answer, circle the best estimate for: $54 \div 0.09$ $54 \div 0.09$ a. A little less than 54 b. A little more than 54 c. A lot less than 54 d. A lot more than 54	Calculate:

The items were based on the current curriculum practised in schools in Perth and also keeping in mind the situations in my country of Bhutan (syllabus for IV to X). It was done so that the test conducted would be based on the topics taught in those selected schools. The students were not allowed to use a calculator, as it would not force children to think and use their number sense in estimation. In the same way, it would not allow the children to use their computation skills in solving problems.

Both the tests consisted of identical items, with 10, 15 and 20 items for Years 5, 7 and 9 respectively. The only difference was that one test required computation and the other estimation. Several items were repeated for two or three year levels to measure skill development. The administration of the test followed the same pattern in all the classes, with the estimation test first, followed by the written computation test.

Qualitative methods were used for the interviews conducted with the school children of those selected schools. Two students from each class were selected from the four schools with the help of the class teachers. Selection for an interview was based on children's performances and the relevant teacher's opinion of that child. Therefore, in total, each year had three slightly above average and three slightly below average interviewees for a total of eighteen students.

As such, instruments employed in this study were written tests and interviews. The purpose of using these two instruments was to ensure that the data gathering encompassed more than one technique. Burgess (1996) explains how one method contributes to the other and vice versa on the phases of design, data collection and analysis. Tools used for analysing the collected data were SPSS and Microsoft Excel. The first tool was used to work out the test results in details, whereas the SPSS software was used to find the correlation, standard deviation and t-test of those two tests.

Summary of the Results

As suggested in a number of studies, a child's number sense and computational estimation are closely allied, and the result from this study also supports the point strongly. The findings in the two tests and interviews through correlation and t-test show that there is a close relationship between estimation and computational abilities in all three-year levels. The result also indicates that a child who is good at estimation could explain the problem with understanding. Moreover, the results show that being able to estimate generally leads to correct mathematical computations.

On the other hand, many students who were weak in estimation or number sense could still perform computations correctly. From this, one could conclude that it is not necessary to be good at number sense to perform computation. But it is very important to possess good number sense if one is to estimate and make sense of the given computations.

However, for some individual items, there were extreme cases with very high scores in written computation and very low ones in estimation and vice versa. The reason could be that the child was weak in number sense and scored very low in estimation but was good at rote-learned methods and scored higher in computation. Thus, having knowledge of estimation is very important in solving mathematical problems with understanding.

As pointed out by Sowder (1988), justification for teaching computational estimation is that it develops number sense. Likewise, the result of this study also supports the notion that estimation can play a significant role in raising the general level of quantitative literacy and mathematical understanding among students and adults (Buchman, 1978; cited in Edwards, 1984).

The role of number sense was most apparent when children estimated a solution for mathematical problems. For instance, a child with good number sense could predict roughly what the solution would be before actually computing the problem. Whereas, a child who was weak in number sense jumped directly to the rote-learned steps and tried to get the answer without understanding the problem. For him or her, getting answers seems to be more important than understanding the problem.

Likewise, the findings by Yang (1995, p. 180), show that:

Interviews with students revealed that high ability students demonstrated a wider range of characteristics of number sense than middle ability students. Middle ability students tended to use the written computation algorithms more often than high ability students.

At the same time, this study also shows that many of the students did not seem to grasp the values of the number being computed. As such, results from several investigations on estimation depict that good estimators are flexible in their thinking, use a variety of estimation strategies, and demonstrate a deep understanding of number and its operations (Dowker, 1988; in Sowder, 1992). This research also supports that "correct answers are not a safe indicator of good thinking...teachers must examine more than answers and must demand from students more than answers" (Sowder, 1988, p. 227).

A comparison of the selected topics showed that students' performances were much better for addition and multiplication of whole numbers. A majority of the students were quite weak in division, particularly for decimals and fractions. For example, less than a half of the Year 5 students correctly computed $598 \div 9$, showing lack of understanding of the concept of division of whole numbers. Similarly, Year 7 and Year 9 had problems computing $\frac{5}{8}$ of 512 and $54 \div 0.09$, indicating a poor concept in multiplication of fractions and division of decimals. It appears that not many students were aware of number relationships, and neither could they make any connections between related expressions (Macintosh, Bana and Farrell, 1995).

The results also revealed other conceptual difficulties. Besides that, performances of Year 9 students were very low in the other two topics of percentages and ratios. A similar kind of study was also carried out by Sowder and Wheeler (1987) which found out that most students before Year 10 were not able to correctly compare $\frac{5}{6}$ and $\frac{5}{9}$. Likewise, in another study by Peck and Jencks (1981), a poor performance for comparing fractions such as $\frac{2}{3}$ and $\frac{3}{4}$ was demonstrated. Both the findings are cited in Yang (1995).

Regarding the performance with the age or year level, the result indicates that there is some development or progress from Year 5 to Year 7, but not to Year 9. However, compared to Year 9, Year 7 have done better in both estimation and in written computation. Thus, results from the current study suggest that it is not always true that the children's development of number sense improves with age or year level.

There is a smooth development of performance across the year levels for the concepts of whole numbers particularly in addition and subtraction. The reason could be that the children have a firm understanding in these operations, as is clearly indicated by the performance in both the tests.

Generally speaking, the problem with Year 5 is mainly with the understanding of the concept and making sense of what they compute. They seemed to have less problems with the written computation, probably through the rote learned formal algorithms. On the other hand, the case is slightly different with Year 9 children, as they were found to be reasonably good at estimation but not that sound in written computation. The most likely reason is that the students in Perth at that level mainly compute with the use of calculators, whereas the students in the researchers' home country are not permitted to use the calculator inside the classroom while solving numerical problems. As such, the children in the sample tested seem to have lost skills in computation with pen and paper.

The Year 7 case is a mixture of the two above problems. Children in this level happened to be quite good at both the skills (estimation and computation). They tended to be far better in making sense of the problem than Year 5 and better performers in written computation than Year 9. Overall, performance in Year 7 is more balanced than in the other two levels.

Regarding the performance level in computation and estimation in each of the topics, this goes in a descending order from whole numbers to ratios. The relationship between estimation and computation remains fairly constant but the performance becomes weaker as it moves towards the higher year level.

The gender issue was also explored in the study. The main purpose was to find out whether results supported what other studies had found - that is that boys are better than girls in computational estimation (Reys et al., 1980). Unlike their findings, the result shows not much gender difference in performance. According to the results shown, there are some marked differences in particular topics for both girls and boys. For instance, the performances of girls in computation were far better than those of boys in Year 7 and Year 9, especially in the topics of whole numbers and fractions. The difference of percentage scores of Year 7 and Year 9 in whole numbers is 8% and 13% more than the boys. Likewise, in fractions, girls in Year 7 and Year 9 scored 17% and 10% more than what the boys obtained. Thus, the result indicates that although boys are ahead of girls in most of the items, the difference in performance as a whole is very low.

Implications

As suggested by Macintosh, Bana and Farrell (1995), this study also leads to a number of implications for curriculum development and teaching practice in the mathematics classroom as follows.

- The curriculum needs to be much more flexible to serve a wide range of abilities, especially in computational estimation.
- Teachers should introduce estimation skills by encouraging strategies that are suited to the individual student.
- Students need to develop a sound understanding of the number sense, and be made aware of relationships between number facts.
- Teachers should integrate computational and estimation skills in mathematical topics where these apply, so that no computations are undertaken without estimation.

- Lastly, it should be stressed that real-life computation involves much estimation, so classroom teaching should emphasize computational estimation rather than concentrate on the paper and pencil algorithms.

Recommendations to the Bhutanese Schools

Since the study was based on the problem faced by the children in Bhutan, the researcher's recommendations are to be stressed here for that country. A study of this nature is new in the Bhutanese context. Consequently, the researcher would like to recommend to the Department of Education in Bhutan the following points which the researcher considers manageable and, more importantly, useful:

- To set up a committee to look into the national curriculum and teaching syllabus of mathematics with a view to reviewing the methods of teaching. This review should be done in the context of updating the methods and introducing an approach to estimation to help children compute mathematical problems with understanding;
- To provide an appropriate in-service training for the teachers so that they will be able to implement the objectives of such an approach (computational estimation);
- To equip both the schools and the training institutions with requirements and resources that will help implement an idea of computational estimation in children;
- To increase the understanding and make sense of their computation;
- To integrate computational estimation in the national teaching syllabus, which should be based on the children's environment so that they can easily relate what they have learnt. In other words, the children should be able to see the practical aspects of the concepts they come across in real life;
- The place of computational estimation skills in teaching mathematics should be seen as something which can support one's ability to use mathematics in real situations faced in everyday life; and
- Lastly, since the introduction of computational estimation requires extra time for the children to get used to it, teachers may need extra time for the coverage of the syllabus. Hence, it is recommended that fewer topics in mathematics to be introduced, especially in early primary education.

Suggestion for Further Research

Throughout this chapter, a number of questions relating to possible further research have been raised. These questions are detailed below:

- What effect does the relationship between number facts and computational estimation have on teaching and learning mathematics?
- What type of estimation items do students prefer to be presented visually/orally?
- What differences are there between strategies used in oral versus visual presentation?
- If the time currently spent on written algorithms in classrooms were devoted to computational estimation, what differences would this make in teaching and

learning mathematics?

- If the computational estimation items were contextually based, what difference would this make to performance?
- What is the relationship between children's computational estimation and their over-all number sense?

Lastly, many such studies need to be carried out in many other countries to see whether the same results can be applied or not. Besides, the issue of whether children should be taught to use certain strategies or simply be made aware of them is one that requires more research. Given that a body of knowledge is beginning to be built up about a number of strategies the question of what is the best way to impart this knowledge to children demands attention. Further research also needs to be carried out to determine the relationship between estimation and computational abilities related to mathematical topics other than whole and rational numbers, such as measurement topics. As pointed out by many mathematics educators, too much time is spent dealing with written arithmetic. As such, the time hitherto spent on written algorithms might well be used to develop estimation skills. Such a study could be used to determine whether the overall computation performance changes as a result of increased time spent on developing skills in computational estimations.

* * *

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DEDICATION TO LEARNING

-Michael Hawley

I. Prelude

Think for a moment about the ways that music touches you most specially.

If you play an instrument, one thing you know, even if you've never thought about it explicitly, is that the more you play, the better you get, and the better you get, the better you feel about yourself. Things like music, in which you practice and improve, build self esteem, and the uplift is infectious: if you're playing well, and feeling great about it, just about everyone else within earshot feels the same warmth. If you're the listener, when you hear someone play or sing, whether it's a friend, or a master musician, or perhaps a child, and they put real feelings into the music, the room seems to glow with emotions. Everyone's good spirits are lifted by those simple feelings. The melody is so transient, so evanescent. Musical moments are so fleeting, and yet – when you're touched that way, you'll often remember those moments forever. These qualities are so special, so transcendent, that it's little wonder that the relationships that blossom and grow around music, and especially those between students and their mentors, are so endlessly to be treasured. The character of time spent in this way, so uplifting and humane, is at the core of all great learning relationships, but music seems to deepen and enrich them even more. That's why I often cite Bart Giamatti's remarks that the sheer noise made by a great university, the bubbling and chaos you hear budding around vibrant schools, is, perhaps, the real music of civilization.

I play the piano. I realize there are very few pianos in Bhutan, and even fewer western style orchestras. I also know³ that music accompanies life in Bhutan rather differently from western concert rooms and recording industries. So it is a little hard for me to convey to my friends in Bhutan what it feels like when a symphony orchestra invites you to perform as a piano soloist. But it just happened to: the Boston Pops orchestra "American's Orchestra" – has asked me to perform a piano concerto by Franz Liszt this June. Well, the answer to such a proposal is easy: **YES!** If you don't happen to know the piece, you learn it. If you don't happen to play the piano, well, you bite the bullet and learn that, too. The piano concerto is an absolutely delicious, soaring, uplifting art form, one of western music's greatest inventions, and every lucky pianist who has had the chance to play one – or even better, to write one – felt the same thrill when the opportunity came their way.

II. Andante Molto Espressivo

But what to play? There are so many magnificent pieces to choose from. After batting around many ideas (Brahms, Gershwin, Tachmaninoff,.....) we settled on the second concerto by Franz Liszt. I nudged the orchestra toward that piece for three simple reasons. First, it's got really rich variety in solos and orchestral/piano writing so it's lots of fun to play. Second, it's simply a fabulous piece: crowd pleasing to the audience, and great fun to play if you're at the keyboard. And third, I knew I could learn it in about a week if I had to! My academic schedule is always snowed in, especially in May and June, so comfort was a factor. So Liszt #2 it was.

Franz Liszt was utterly phenomenal. Before the Beatles, or Leonard Bernstein or Steven Spielberg, there was Franz Liszt. He was, by far, the most famous and charismatic star in the 19th century. He was also one of the world's great travelers (he played concerts from Dublin to London to Paris to Constantinople to Kiev, and saw an astonishing array of cultures across Europe and Russia by the time he was 37 in 1848). He gave the first benefit concerts; invented the solo piano recital and the orchestral tone poem; pioneered modern piano virtuosity; invented the master class; and, as a person, and as a mind, was a dazzlingly eclectic personality. His concerts always caused a sensation. An extraordinarily complex man, Liszt was simply the dominant figure in 19th century music, and remains the most groundbreaking and influential piano genius of all.

Now, just about every bit-name piano concerto you can think of was premiered by the big name who wrote it: Bach, Bartok, Beethoven, Brahms, Chopin, Gershwin, Rachmaninoff and more – all of these men premiered and played their magnificent concerti. Rachmaninoff premiered his third concerto with Gustav Mahler conducting. And Liszt played his; in fact, Liszt performed his first concerto with Hector Berlioz on the podium.

Well they say that in science, the most exciting exclamation isn't "Eureka!" – it's: "Hm..... That's strange....." And I had one of those anti-eureka moments of insight when I noticed the following curious fact: Franz Liszt never performed his second concerto.

Why on earth not? God knows that Liszt, of all people, was supremely positioned to play his own piece. It really is startling to think that the greatest piano virtuoso of all time would buck the trend and not play his best work for piano and orchestra.

A bit of background might be illuminating.

Liszt started work on the piece when he was 18, and tinkered with the score for more than 30 years after that. In its gestation, the work was more like a Beethoven symphony than one of Liszt's infamous potboilers. After Liszt settled down in Weimar (age 37), he focused on composing, writing and teaching. He began producing masterpieces at an astonishing clip – the symphonies, the tone poems, the sprawling piano sonata, big organ pieces like the *Ad Nos* fantasy, oratorios, and a mountain of piano music. The creative outpouring was volcanic. Liszt also conducted like mad – all the Beethoven symphonies, the Mozart centennial, premieres of Wagner's operas and major works by new composers like Schuman, Berlioz, Verdi and others. He wrote two books.

And with all of that behind him – 20 years of touring the world, 10 years of enormous compositional productivity, and with a truly extraordinary perspective on pianos, music, and life, Liszt hunkered down and finished the second concerto. In a small twist, he gave the piece a title that has since been forgotten: he called it a "*concerto symphonique*." By that, he may have meant that this wasn't just another virtuoso vehicle for piano "versus" orchestra, something you drive through to win a standing ovation, but rather, it was a holistic and poetic amalgam. The piece was finally premiered in 1857: Liszt was 46. And then it was revised, over another six years. Liszt finally published it in 1863. He was 52 by then.

At that world premier concert, and several others, Liszt chose not to play. Instead, he conducted. So who was the pianist? My goodness, what pianist could possibly have played such a piece in the shadow of the composer, one of the greatest maestros ever to stand on the podium? It was 27-year-old Hans Bronsart. What's more, *Liszt dedicated the piece to him*. Now, most piano concertos are dedicated to the rich person who paid for the production. Or sometimes to a dear friend. So who was Hans Bronsart? I'd certainly never heard of him. But he was an extremely significant person to Franz Liszt. In fact, Bronsart was Franz Liszt's favorite student. What a mark of specialness that concert and dedication were. As far as I am aware only Liszt's students played the piece during his lifetime.

Liszt's depth and devotion to scholarship was not widely appreciated in his lifetime. It still isn't. He was so outrageously popular that critics were dismissive of his intellect, which probably spurred Liszt to work even harder as a result. Unlike Brahms, Liszt did not destroy his bad work. He kept experimenting, sometimes producing great stuff, and more often falling short. But it was as teacher that Liszt left his deepest legacy. He was an extraordinarily devoted mentor, accumulating over 400 students by the end of his career. At his home in Weimar, there were always a dozen students living under his roof or very nearby, and that indeed is where "master classes" were born. Liszt believed that students learned more, and learned *better*, by playing for and critiquing each other than they ever did from isolated practicing and coaching. Liszt's firmly held conviction was that to be a great pianist, you had to be a whole person, liberally trained, broad and deep. So Liszt, who seemed to know just about everyone, introduced his students to a stunning array of beautiful minds – not simply beer with Brahms and picnics with Wagner, but quality time with leading scientists, philosophers, monarchs, writers, and scholars of all stripes. And Liszt never charged a penny for a lesson. There were students by his side until the day he died. In fact, in his will, after naming his immediate family, Liszt mentions his students, and asked that special mementos (photographs, scores, letters from creative artists, rings) be divided among them so that they might have souvenirs to rekindle their memories and inspire them going forward.

Liszt's second concerto is rather seldom played (although I think it's a much richer and much nicer piece than the first). In fact, I have professional musician friends who've never even heard it. That's nice in a way: one can savour the specialness that much more. But it's a shame that the real genesis of this music is virtually forgotten. Underneath the glittering notes and the lush harmonies, this piece really does say a lot. It represents a remarkable and deeply thoughtful synthesis, steeped slowly to maturity over more than 30 years, gradually sculpted and polished into final form by one of the most powerful, probing and wide-ranging talents the music world has ever known. And in the end, with that dedication by Liszt to Bronsart, it was given with generosity and purity as a gift to students by a truly devoted teacher.

III. Finale

It's rather amazing (to me, at least) that I learned to play music at all.

When I was four or five years old, my mother got a piano, a small "grand" piano. I began plinking out tunes, and mom thought I should have lessons. I think my father might have thought football made more sense at the time. And so, I had piano lessons.

After the fourth lesson, my teacher threw up her hands in despair. "he's a hopeless case," she said. "I can't do anything with him. Save your money. He should play football."

So I did. I played football until about fifth grade. And then I made a change. I switch to what we call soccer. I didn't really get into piano until after soccer. I was definitely no Mozart. More of an "adult prodigy" than the next Mozart.

As an undergraduate I went to Yale University. And my first week there as a freshman, I went to the School of Music at Yale to audition. There were several older people in the room, and I played a few bars of a Tachmaninoff prelude. Then a bit of a Liszt etude. One of the oldest folks looked over his glasses, scribbling on a notepad, and said "Michael, you'll study with me."

I had no idea what had just happened, or the significance of it. Music departments are often jewels at big universities, but Yale's is more like a treasure chest. No other great university has such a rich and gorgeous musical life. There were great concerts literally every night in the residential colleges: an absolute paradise. The man who'd taken my name was Ward Davenny who turned out to be the head of the piano department. He had just given me a scholarship.

We had a lesson (one-on-one) once a week. The thing I remember most: those lessons were seldom less than three hours long. This went on for *four* years. We also had a weekly master class. And chamber music sessions. I was assigned accompany graduate students ever semester, and played two or three concerts per term. Ward never missed a concert. No matter how bad a blizzard was howling, Ward was always there, an *eminence grise* in the back of the room. We usually scheduled a lesson the next day to do a post-mortem: what worked, what fell flat. "Your best rehearsal is you last performance" he used to say.

Much later in life, on the faculty at MIT, I became aware of how remarkable it was for an MIT professor to spend three hours with anyone, let alone a lowly freshman. I wasn't alone, obviously, though maybe I needed more time than the other students.

Eventually Ward retired, though he kept plying and teaching. He settled into a retirement home where a number of elderly Yale professors had moved into "dry dock." And every Sunday at 4pm, Ward organized a concert for the folks in the home. Usually it was given by one of his former students, most of whom had gone on to professional careers and became real luminaries. Sometimes Ward played. Once a year, I would visit religiously, and always felt like the black sheep on the family. But how special it was to play there. The scene was always the same: about a hundred people in the flickering twilight of their lives, Ward in the very back, many folks in wheelchairs, or breawthing oxygen. I've never seen a music mean more to pople. After I played, two things always happened: first, an elderly woman would give me a peck on the cheek, and with a trembling hand would offer me an envelope. "It could never possible be enough, but please accept this with our deepest thanks." It was a check for \$ 100, and I always tore it up when I got home. And second, Ward would take me into his apartment, sit me down with some juice or scotch, and give me a little laundry list of tips and suggestions for things to try in performance.

In June of 2002, I entered the Van Cliburn international piano competition for outstanding amateurs. Outstanding is not the word: about 100 people came from around the world, people whose careers were nonmusical – doctors, *lawyers*, professors, home makers, the Brazilian ambassador, the *croupier* from Las Vegas – an astonishing variety of beautiful minds. And, my God, can they play music. It brought out of the closet the well-kept secret that some of the best music is made by *amateurs*: people who do it for love.

Unbelievable, I *won*. There's nothing quite like the reward of a huge, spontaneous standing ovation because you took the time to put your heart and mind into making something beautiful. Ten minutes after the announcement was made I was on the telephone to Ward. What a joy it was to make that call.

On December 1 I was scheduled to make my Boston debut at a very fancy place, Jordan Hall, one of the loveliest pure music rooms in the world. The concert date was Sunday at 4pm. And exactly one week before to the minute, I was with Ward and his friends at the Whitney Center, playing my program for the dear people in that retirement home.

Again the usual routine. But this time I was eager to get the feedback since I wanted to get everything polished brightly for my debut. "Got any tips this time?" I asked. "Oh, Michael....." said Ward, slowly, "Michael, I've got plenty to say to you. But it won't take long."

"Michael," he began, "I am simply..... in awe. There's no other word to describe it. Maybe it's because I remember so vividly how you played when I first heard you. But you know the sound you want to make, and you make it so very beautifully. The Bernstein was magic. The Rachmaninoff was such a joy, and he himself would have loved what you did. To me, you are the quintessence of the true *amateur*, in the best and purest sense of the word. You cannot imagine how happy that makes me." And I left, somewhat stunned.

The next Sunday I played the concert as planned. I only had a moment for the briefest phone call, just to let him know how happy a concert it was. And the following morning, December 2 at 6am, I was at the airport, on my way to Bhutan for a month of photographic work with the wonderful children there.

A few days into the trip, I received a piece of email. It was the review from the *Boston Globe* newspaper, and it was glowing. "It All Adds Up to a Brilliant Concert by MIT's Hawley" read the headline. I was overjoyed to see it.

The next email message was from a friend, letting me know that Ward had passed away in his sleep. Heart failure.

I broke down in tears. But the tears were as much in joy as they were in sadness. I was, I believe, the last student to be able to play for him. What a beautiful note for our relationship to cadence on.

Awakening to Narratives of Experience - Deki Tshering Tiala

Genesis

"There is nothing higher and stronger and more wholesome and useful for life in after years than some good memory, especially a memory connected with childhood, with home. People talk to you a great deal about your education, but some fine, sacred memory, preserved from childhood, is perhaps the best education. If a man carries many such memories with him into life, he is safe to the end of his days" (Jalong, 1995, p 51).

Memories are, thus, accumulated stories of experience. I have a story to tell - a narrative to connect with my personal and professional journey. It is my story - a means "to travel the road I have taken".

Coming from a family with a teaching background has shaped the person I am now. My grandfather was a language teacher in a community school. My father and mother were also teachers in Jakar Primary School in Bumthang, central Bhutan. My life then revolved around the school bell, sometimes following my father to his class and sometimes following my mother to her class. Having grown up in a school community, my life was closely interwoven with the landscape against which my family and I lived.

Living in such an environment, I grew up knowing about what it all means to get good education. As a growing-up girl, I had a strong sense of purpose. I wanted to meet the expectations of my parents and teachers because they convinced me that doing well in school would lead to admission to a good college, which would in turn lead to a productive and prestigious career.

And, for me teaching was one such career, as I wanted to follow in the footsteps of my parents. So many memories have been my guiding light as I took up the teaching profession. However little these incidents may be, they have become an integral part of my life. School life played a vital role in grooming the person I am today. Looking back on my school life often makes me feel nostalgic.

As a young girl, I got an opportunity to study in different schools outside Bhutan. Each time I went to a different school, I was in a very different society of unique culture, tradition and language. At one point of my life, I was in Nagaland, in the north-eastern part of India where I experienced the Naga culture. I had great difficulty in adapting myself to this strange and different society. At another point of my life, I was in the south-eastern part of India, in Kolkotta, where I experienced the Bengali culture.

Living in a different society and culture, I gained rich experiences and now they have become a part of me. "A society of many traditions and culture can be a school of life" (Bateson, 1994, p 8).

This is indeed true. "Our lived experience constitutes the world of everyday life, especially how individuals consciously develop meaning out of their interaction with each other" (Swingwood, 1991, p.12). My meeting with Arenla Jamir, in Nagaland was a turning point in my life. I remember, in particular, my visit to Changtonia, a small Aao tribal village in Mokokchung with Arenla's family to meet her grandparents and her relatives.

Here we were welcomed with some dances, where men, women and children joined hands in an immense circle and dance. It was here that I met a gaunt-looking woman in her weather-beaten blouse with a hole in the side and a torn *mekhala* (Naga dress for women) that exposed her legs. In her arms rested a frightening-looking child covered in a tattered sheet. The woman was smiling at me. I was so engrossed in the thought of seeing this underprivileged mother with her child that I almost didn't notice that she sat next to me and begun talking. "Are you Arenla's friend?" she asked.

It was strange. Not the question, but the voice. The words flowed out of her lips in a musical manner. After accepting this curiosity, I answered that I was Arenla's friend. I made an effort to stop analyzing her so that I could proceed with the conversation. She told me that she lived in that village since the day she was born. As I listened to her story, I could not resist stealing glances at her uncovered child.

Before I could ask anything about the child, she hit me with two questions that knocked me over. "Are you married?" "Do you have children?" "You are joking," I replied. "I am only seventeen years old." At this, her face lit up. Something had pleased her. Her next words shocked me the most. "I am seventeen too."

I never got her name - the woman with a baby. I don't think the baby had a name to get. For two nameless souls, their impact upon me was profound. She was the same age as I. We were born at the same time but into worlds entirely different. There was one link that united my world and hers - the biological phenomenon of the same sex.

I cannot say what she learned from me. Was she smiling for the sole similarity of our age? Was she amused by the staggering difference between us? I do not know. I learned from her about the universe that I had not considered before. My daily problems centered around getting home assignments done; her life revolved around the survival of a wilting child in her care.

After my encounter with her, everything for me seemed to echo the disparity of the world and most of all, the importance of an education for every girl or boy, rich or poor, regardless of their differences. Through my own lived experience, I believe that every child can, and will learn, given an appropriate environment in which they can develop high expectations and respect for self, and where they will have opportunities to communicate, solve problems, and make contributions to the society.

My interaction with this nameless woman in Nagaland led me to set my vision for life, focussing on helping the children who will develop personal discipline, self-organization and social skills necessary to prepare themselves for the future. In the August of 1998, I joined the National Institute of Education for my Bachelor of Education programme. I graduated in August 1992 and since then there has been no turning back.

On being a teacher

“It is by teaching that we teach ourselves, by relating that we observe, by affirming that we examine, by showing that we look, by writing that we think, by pumping that we draw water into the well”. (Henri-Federic Amiel)

I started my teaching career in Yangchenphug High School. Here, I learned to make the students responsible for their own learning instead of just standing in front of them and imparting a body of knowledge. Although this was my belief about teaching, it was really very difficult to involve students in activity-based lessons in the school that I taught. This school was one of the largest high schools in the country with a student population of 1200 ranging from 9 to 12 sections. Each Class 9 and 10 had eleven sections of 35 to 40 students. There were seven to eight students seated on the long wooden benches and with a desk in front. The classrooms were compact with no space for the teachers to move freely.

Activity-based lessons were impossible. I used to stand in front of the class and teach for 45 minutes and then move to the next class mostly lecturing and not really caring if the students understood what was being taught. This continued for almost two to three years. And I was satisfied with the way I taught. But when the students did not fare well in my subject in the board examination, I began to feel the pinch. I realized that what I was doing was wrong. So I started exploring new ways of teaching strategies (e.g. trying small group activities for the first time in a large lecture class).

This worked well but it became difficult for the syllabus coverage on time. But I had to work hard taking extra classes even during holidays. But I did not mind doing this as I became more satisfied with my teaching. But involving students in group learning and group activities needed careful planning. When I started this new strategy, I would divide the class into groups and give each group a problem to solve. I gave them little or no direction, believing that this was creative teaching. So the end-product of the class discussion was quite confusing.

I remember one history lesson in particular. It was on the topic, “Druk Gyelpo Jigme Dorji Wangchuck” and I was dealing with the question of why Druk Gyelpo Jigme Dorji Wangchuck was called the “Father of Modern Bhutan”. Students were asked to find his achievements in social, economic, religious and political spheres. The students were divided into four groups and each group had ten members.

Before the students could complete their assigned work, the bell rang and the activity had to be carried to the next class. This was because it took a long time for the class to get organized into groups. And, once the group was formed, the students were more involved in talking rather than solving the problem as they were confused about how to look for the information from the text-book.

I, being alone in the class, was not accessible to all the groups and it took me a long time to move from one group to another. I later realized

that I could have written the questions on the blackboard with the groups' name and a reform that each group was assigned. Students needed proper guidance and direction to solve and brainstorm as well as opportunities to explain and share their work with others.

With this purpose in mind, I began to plan my lessons more thoughtfully. I was impressed with the thoughtful planning approach to teaching. Students came up with varied and interesting responses and ideas. The other thing that I learned was seeing teaching as involving a reciprocal relationship between teachers and the students. I believe teachers have their duties to their students and that students have their duties to their teachers. This belief implies that we must not see students as our customers or as clients. From my experience as a teacher, I was always considered as a very strict teacher. The students would not ask any questions or talk openly with me. There was always a distance between my students and me. Due to this, my students were not learning effectively. This realization came to me when some of my female colleagues confided in me about my attitude to my students. I immediately tried to break this ice and started building cordial relationship with my students. But it was difficult for some of them, as they had an impression of me as a very strict teacher, as somebody very difficult to approach. But I did try to change for the better.

With my belief that "students learn by doing" and that "teachers plan lesson and teach not just information but thinking skills and the process of investigation" has allowed me to reflect through each of my experiences and each of these experiences has guided me all through my career. I taught in Yangchenphug High School for eight years. But eight years were never the same, and my philosophy of teaching continued to evolve as I learned more about my student's needs and about the craft of teaching itself. Like most of my female colleagues, I look for ways to make a school more meaningful within the present moment and not just for future reference.

On being a principal

After having worked tirelessly for eight years in Yangcehnphug High school, I was recommended to sit for the head teacher's interview by the principal of this school. When this offer came, I was not prepared to take up such a responsibility. But I was fully encouraged and supported by my husband and my parents. As I reflect back, I feel I was able to become principal because of my own hard work, persistence, determination, ability to organize and willingness to accept responsibility and difficult tasks.

In March 2000, I began a journey that would become the most exciting and rewarding experience of my life. I was to become the principal of Gedu High School. I was transferred to Gedu High School as the assistant principal. When I first joined the school, I was to take over the charge of the school from the headteacher of the primary school, because the school was then upgraded to a high school.

During my tenure as the principal, I felt that I could not lead the school effectively in the direction that it was supposed to go. Because the school was new and the principal, too, was new, I was not prepared to take up this challenging task. With just eight years of teaching experience, I felt that I was straightaway pushed into a position as a school administrator. What was learned from the principal of my previous school I was able to implement, but most of the time, it was trial and error. And in doing so, I was consciously and unconsciously undermining some of my teacher's responsibilities and duties.

"A new head entering a school inherits an organization and its resources - without doubt, the single most important of which is the staff. For any organization to operate at all, people are needed. It is their presence, their willingness and their effort, which enables the organization to discharge the task expected of it. The focus of management is very much on the membership of the organization." (Weindling, 1987 p.79)

Early in my first year as a school principal, I experienced great difficulties with many of the teaching faculty. I felt that my leadership style was not liked by many of the staff in the beginning. I was very strict and very particular about my expectation of the teachers and about the way they were supposed to behave. It took some time for me to understand the culture of the school. When I say I am strict, I mean that I am very particular about being punctual, particular about the quality of the work assigned, particular about the accountability to the work, and the most important was being committed to one's job and responsibility. By nature, I have this quality and I expect the same from everyone, which is, of course, difficult to get from everybody. No two human beings are the same and it is difficult for many individuals to change to suit others' attitudes. Perhaps, the more I write this story, the more I realize what may be my weaknesses.

When I first joined the school in March 2000, I did not feel that I was in a good working atmosphere and environment. This is how it was among the teachers - there was a different group which always did everything together in the staff room, stood together in the morning assembly, went out for lunch together and did many other things together. I saw this as a very informal group among the teaching staff because everything that they did was entirely different from other members.

"A crucial aspect of understanding the culture of an organization is to understand the organization's history and its tradition because individuals in an organization are socialized to accept them." (Owen 2001, p 155)

Prior to my joining the school, the headmaster and the staff were very friendly. Teachers were free to do anything they liked. The teachers would take advantage of this friendliness and leniency. The staff seemed anything but orderly. Though teachers had assigned duties but most spent their free time and even their class time gossiping and engaging in private business with other teachers. The teachers could leave the class and go for their personal work to the bank, hospital, town and even home when they did not feel like teaching. This was the norm of the school which they had accepted as legitimate within their group. A group of four or five teachers reigned at the top controlling the culture of the entire school.

This was seen as the tradition of the school, but for me, it was a serious problem among the staff. They did not have the proper sense of direction in school matters. They felt that other than classroom teaching, they had no other duties. To me, as the principal, the climate in the school just did not feel right. Those few or most staff did not interact much beyond the small circle of immediate colleagues. People did not seem to trust each other, so the first staff meeting seemed superficial.

The important things happening in the school were never talked about openly. It was pretty hard to feel good about working in the school every day. I felt that what they were doing was wrong. Miss Denka, came to join the school in the beginning of March 2001. She seemed to be a good teacher in terms of her behavior in the beginning. She then became a good friend of Miss Yangzom. Their relationship in the school business became so powerful that Mrs Denka also helped to establish group norms. This group environment influenced her behaviour. Such interaction among the staff affected the school culture, moulding the behaviour of other teachers and students in the school.

As an inexperienced, young, and female principal, I often felt very insecure around the issue of staff development. I often wondered whether I was being too supportive of or too patient with the staff because I thought "was it the right thing to do or because I was avoiding conflict?" In the process of writing my reflective story, I have clarified for myself the conviction that if you believe people can succeed and if you create conditions in which they can do that within the limit of energy, then most of our time is spent in our supportive role. I felt that the teachers needed regular interaction, communication, and motivation in order to work together with their coordinators and their supervisors. After three months of the school session, I seriously started thinking about the whole nature of the school environment. I felt that I should immediately set things right for the school and the students because the students' learning was affected a lot. I felt the quality of teaching and the level of learning that was taking place in my school was directly related to this negative climate of the school.

Fullan and Hargreaves (1991) state that "the greatest problem in teaching is not how to get rid of the "dead wood" but how to create, sustain and motivate teachers throughout their career".

I came to feel that breaking the existing norms and building a good relationship among the staff for the creation of a climate conducive to teaching and learning was essential for the success of the school. And so from the conduct of the first professional development programme for the staff, I, along with the teachers, formed a core group to offer strategies for the consideration of school leadership. Out of this, the school management team was formed comprising of the principal, assistant principal and coordinators (representing different areas of responsibility) and to support this management, working committees were formed. Each of these teachers was in different committees such as discipline committees, admission committee, and co-curricular committees all accountable to the coordinators. Within this group, group norms were established to govern the work of the collaborative team. These norms were such things as conducting meetings on time, listening attentively, agreeing and disagreeing within the group etc to provide a basis for the work of effective group and guided group members' working relationship. What was learned as a teacher from the principal of the previous school that I worked with, I could implement by listening to individual teacher's problems, going to the staffroom and having a very informal talk.

The teachers slowly started taking their responsibility seriously and for the first time, I felt things were looking good. Everyone was involved in his or her own job. Change was beginning to appear which included sharing of responsibility among the staff, some improvement in the relationship and the staff and most importantly, the students' interest in coming to learn in the school.

As a management team, we all felt that we had a responsibility for ensuring that all students get a high quality education. The school journal for teachers addressed ways in which the principal could provide leadership by establishing performance standards, engaging in ongoing monitoring and supervision to support and promote both individual staff development, and shared accountability for student achievements.

But this happened only in the second year of my principalship. But then, I was not confident to do the things that were happening in some of the neighbouring schools and also I got the opportunities to visit schools and get their ideas about school administration. Some of the activities that were carried out for the school growth were introduction of Intervisitation Cycle, school based-in-service programme, monthly staff meeting and self-appraisal form for the teachers.

I would like to share one more story which I feel is worth mentioning here. This is because this story helped shape my professional life later in that school. This is about the group of teachers, with a particular one Miss Yangzom and Mrs. Denka who were the best of buddies in the school. They shared everything in common and had much in common. Shared leadership in the school and the formation of school management teams led teachers play a leadership role in whatever committees they were assigned.

Miss Yangzom was on the school admission committee representing the primary section of the school. When it comes to admission formalities of pre-primary, it is very important that the school follow the policy guidelines of the Education Department.

The dzongkhag and the school carry out pre-primary admission using the criteria set out by the Education Division. In order to qualify for admission, children must attain a minimum of six years as of 10th of March and their parents must either work in or be a permanent resident of the school catchment area. The head of the school has to ensure that the criteria are strictly adhered to. In order to avoid any misuse of this policy, the admission committee is comprised of not only the teachers but also the representatives from the parents and community. Whatever was decided by the admission committee, I was making very sure that I had the final say on the matter of admission because it was my responsibility to strictly follow the policy.

Miss Yangzom mis-used the power of admission committee and admitted seven children without informing the committee members. The admission was closed by the end of the admission day and all the committee members signed the admission register. I was not aware of what had happened as I had to leave the school for two days to attend meetings in Thimphu but I had handed over my administrative responsibilities to the assistant principal.

After I came back, I started hearing lots of complaints about the school being not fair and discriminating between rich and poor, educated parents and illiterate parents.

Some of the poor parents' children were not admitted, as they were not able to fulfill the admission criteria. But these parents were of the opinion that children who did not even attend the interview and did not complete the admission formalities were admitted and were attending the school.

After hearing all the complaints, I had to call the admissions committee meeting and check the register. I was shocked to see the entry of seven children's name against the signature of the admission committee. When questioned as to who had done it, Miss Yangzom admitted very reluctantly that she did it.

Since she was one of the members of the admission committee, she thought that she had the power to do what she liked. The assistant principal too was unaware of what had happened during my absence. I was now in a dilemma as to how to solve the problem because I was answerable to the dzongkhag.

The parents of these seven children had to be called immediately and they were asked to take back their children which I felt very bad about to decide this with the admission committee. Some of the parents were very angry with me and even challenged me in the office. I was shocked, hurt and humiliated by their outrageous attitude. Then in return, I had to scold Miss Yangzom and threaten her for what she had done. I felt that that was my worst experience as a principal. But now when I reflect back, I was wrong.

Shared leadership and accountability to their responsibility was not questioned. I have realized that I was not successful in influencing my assistant and the teachers to hold themselves accountable. I believe a good leader brings out leadership qualities in any person associated with him or her. I had not created a system that functions automatically without having the leader to instruct individuals of their responsibilities. Successful leaders know the difference between power over and power to. "How could I have given this power to them and also ensured accountability along with it"?

Maybe I was controlling my teachers so that things would turn out the way I wanted. Maybe I should have been more concerned with how my power of leadership could help teachers to become more successful, to do the things they thought were important for the welfare of the school.

Many of the insights into what leadership, the form they can take and their impact on the effectiveness of the school emerge from the training of leaders for leadership.

The other important component of my role as a principal was to focus on leadership for teaching and learning in implementing school change. Our purpose should be focused on the leadership skills, which is seen as an important component of developing a sense of shared vision in the school. In my principalship, the school staff did not develop its vision and mission statements because my leadership style was top-down. So it was not the vision and the mission statement of the school as a group but it was the principal's. This leadership approach affected what was happening in the school. Now I see this was something wrong because as I reflect back, I knew for sure that it was not working. I have learnt how important it is to give ownership and responsibility to the staff that you are working with.

In developing the school vision and mission statement, it is very important to look into the beliefs of the teachers who we are working with. We must put our beliefs at the centre of our planning process and look at them in relation to what we are teaching our students such as curriculum, instructional strategies and so on. I have learnt that when we consider new initiatives or proposals, we should also ask ourselves: does this match our beliefs?" "Does this help us to translate our beliefs into action?" These were some of the insights that I have gained and now would like to emphasize in my module. Because I see this not only as my school problem, but it is very common in many schools in our country where school vision and mission statement are not planned collaboratively and the School Improvement Plan does not focus on the students but rather on school infrastructure and facilities.

On being a student in Canada

After my graduation from the National Institute of Education in the August of 1992, I was seriously involved in teaching in a high school. And as a teacher, the thought of going back to student life had never occurred to me. The offer to do my Masters in Education in Canada came as a big surprise to me because by then I was already a mother of two children. "How could I leave behind my two little children and go to a foreign land for a year and half to be a student"? This question haunted me for many days. It was a very difficult and challenging decision I had to make with my husband and family members. But they supported and encouraged me to go.

I went to Canada in June 2001. My first real day as a student started on 2nd June 2001, when I entered room 231 for my summer courses. The professor started the lesson following the introductory part. The students started the discussion, sometimes in groups and at other times with the professor. They would move around the class writing on the chart papers that were hung on every corner of the classroom walls. The three hours class came to an end with loads of assignments and readings to do for the next class.

I must admit here that I could not make head or tail of the class. I tried to do my reading sincerely every evening and night but I could not understand anything from it. The class continued in the same manner and my difficulty in understanding the course work continued too. So I decided to approach my professor with my difficulties. The professor helped me a lot clearing many of my doubts. No matter whatever I did, I decided to approach them as many times as I wanted if I was to learn.

I realized that I was finding it difficult in everything that I was doing because never in my ten years of service in education had I developed the habit of reading or taken the initiative to learn anything. I was just satisfied with the subject that I taught from the course. So after getting there, I struggled with reading and writing works. But I did not give up.

When we confront new choices, these choices often include improvement in our intellectual life. I thought to myself that I must now read, write and think much more than ever before. I had always said to myself, "Just keep going, and just keep going". Perhaps my determination to learn more made it easier for me to quickly adapt to new ideas and conditions. Knowing how to learn has been key to surviving and thriving in that part of the world. And still there is much to learn. Each term, I learned and

refined my techniques by teaming with different course-mates, working with different professors and continuing my personal research. I can very confidently say that I can see the change in me now, which is evident from some of the assignments that I did. These are included in my portfolio as being of significance to me. I can say today that I am a person who looks forward every day to strive, to seek and not to yield. And I can say that part of this drive came from the education I received as St Francis Xavier student.

As we are all aware, as we become more seasoned in life, we tend to think that we have got the big picture, been there, done that. I must admit that this was the attitude I had when I first began attending the school here. I had been in the field of education for few a years: I had been a high school teacher, an administrator, coordinator of numerous programmes both in school and after school back home. I thought I knew it all. But I was wrong!

The St. Francis Xavier experience changed me from the inside out. The most important change has been to be called upon to reflect, to come out of myself and see myself from a different perspective, to examine the value of what I did and what I do.

As a mother too, I had some sense of what sacrifice I was making. I have admired myself in my selfishness in agreeing to live apart from my family for a long time. I have asked myself several times "Is what I am doing here worth it?" I think this may be my question that I will ask myself many times along my journey, not always getting the same answer each time I ask. This is a difficult part of figuring out the balance of being both a mother and a professional. How I wish there were easy answer to this question!

Professional goals

I would like to share some of the insights I gained through each of these experiences. The principal is the critical person in making change happen by taking the teacher's self into principalship. "Who are our students and what do they need?" This should be the primary concern of the school system, because now I see students as "the epicenter in the wave of a circle".

As a principal, our first priority would be to identify the school improvement target. The entire staff should plan the improvement target as their belief of what successful learning is according to the teachers. Collaborative decision-making creates a healthy school climate, which tends to foster a collective sense, a community. Based on the important framework of schooling, such as language and culture, pedagogy, community relationship and assessment, the school should set up a goal which is then divided into multiple tasks.

The teachers should work collaboratively in several kinds of groups on selected task. Each group should plan how it will achieve its expected result. From time to time, each group must reflect on its progress so that it will allow them to correct, reinforce and re plan their work. The result of the work should be the concern of the principal and the entire staff as it is their collective improvement plan for the school. The principal's task would be to organize and facilitate an interaction system so that their set goals reflect collective values. I, as a principal, should also have the concern to

look into the needs of the students, parents' values and beliefs, school board policies, community culture and so on, which should be incorporated into the framework of the school.

The other area of my interest now will be to plan and look as to what goes into classroom teaching. As teachers, we talk a great deal about teaching strategies and instruction and great amount of our time goes into thinking about what we do, not what the students do. We talk about teaching from the point of view of the teachers and not the learners. We need to shift our emphasis, and focus more on learning needs and learning style of the students. What we as teachers should do would naturally follow then. We must develop school-wide procedures for teachers to assess students' learning needs, learning styles, observe the learning process while students are engaged in planned activities, evaluate the programme and re-plan for future improvement. These are some of the effective schooling process that I could learn during my education in Canada. When I reflect back, I never bothered to look and see what was happening in the class.

As we experience new challenges, some personal changes will occur imperceptibly, our self-confidence will grow too but we need to remain open to change and new ideas. It might be productive at times to reflect on how we have changed and what we have learned about ourselves to overcome setbacks or confronts difficult situation, for instance. This will give us insight into how change happens and it will help us to forecast how we might develop in future. We need to make space in our life to enhance as much as possible our life's experiences. We need to continue to learn and to seek more answers. The more we seek, the more answers we discover about those around us.

Conclusion

I have been reflecting on myself as a person, as a teacher, as a principal, as a learner and as a mother too. And through this reflection, I have seen the growth in me as a high school teacher, shifting from lecture-centered classroom to one which was more activity-based. I have seen the growth I made as a principal, calling a staff meeting to establish a management team in which leadership and responsibility were to be shared. I have seen growth as a graduate student learning to read and write critically about the ideas on school leadership and to make connections between the literature and the Bhutanese context. I have seen growth I have made as a person, persevering through the challenges of significant academic demands and succeeding. And now I see my role not only as an administrator, controller and supervisor but a teacher-educator, an equal partner with the teacher in educating our children.

All this reflection has unfolded into stories that have led me to think more and more and to create more stories for my professional journey. In both literal and metaphorical ways, my story does indeed highlight my journey as a means "to travel the road I have taken" as an educator- my journey from Bhutan to Canada, my journey through many phases of my career. It has been a journey, which has allowed me to stand in the present while at the same time moving backward and forward. It gives me a sense of satisfaction to know as to where I was and where I have reached in my journey. It's a glimpse of the road on which I will continue to travel to achieve

some of my professional goals. As my journey continues, as I look backward and forward, I must not forget to celebrate where I am right now.

Through the process of writing this story, I had such an authentic feeling because I have allowed myself to be very honest and vulnerable in telling these stories. In my effort to make myself vulnerable, I have shared not just what good things I did, but laid open what I struggled with, and what challenged me and what I am still trying to figure it out. As a result of this, readers of my work will have opportunity to think and learn along with me as they move through each page of this narrative.

My journey has involved many challenges along the way, which for the most part I have met and addressed in a positive way. I look forward to my continued educational research into "my self".

PROFESSIONAL DEVELOPMENT OF TEACHERS - A view based on observational research and experiential reflection.

- B B Mishra¹

A teacher can never truly teach unless he is still learning himself. A lamp can never light another lamp unless it continues to burn its own flame. The teacher who has completed the end of his subject, who has no living traffic with his knowledge but merely repeats his lesson to his students can only lead their minds; he cannot quicken them.

Rabindranath Tagore.

ABSTRACT

This paper aims at conceptualising professional development of teachers in a school context rather than delving into the literature already existing on the subject. Based upon the current practices and reflections from my own experiences as the co-ordinator of the Staff Development Committee of Drukgyel High School for the last two years, I shall briefly highlight:

- What professional development of teachers in our school context is.
- Why we need professional development of teachers at all.
- Some of the activities/strategies being carried out currently to promote the professional development of teachers.
- Some of the challenges faced, and the
- Prospects.

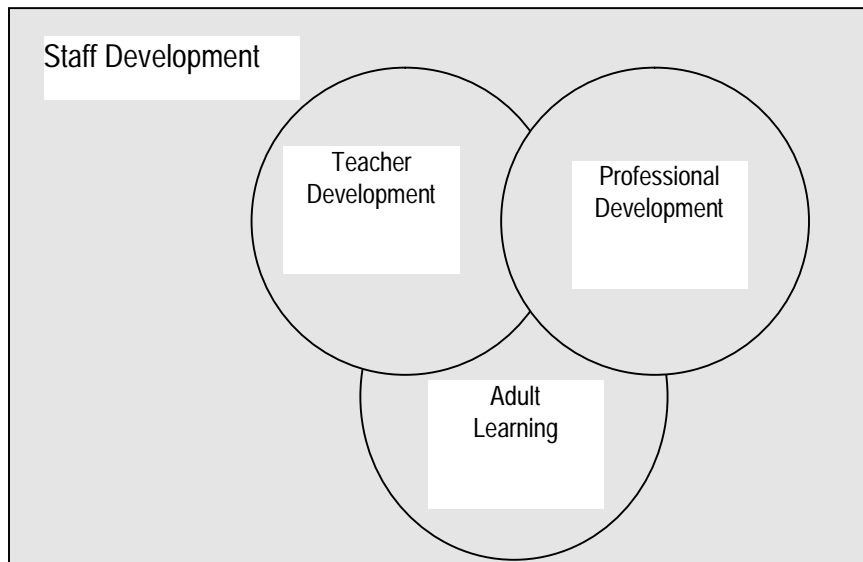
What is Professional Development of Teachers?

Staff Professional Development, Teacher Development and Adult Learning are at times used interchangeably, although Staff Development encompasses much broader meaning than the latter two. However, here I have used the term Adult Learning as one of the means of professional and teacher development. Some teachers have tried and differentiated Professional Development and Teacher Development on the basis of teaching strategies/skills and teaching subjects. While Professional Development programmes, they argue, ought to focus more on the professional aspects of teaching/learning, Teacher Development should concentrate solely on enhancing teachers' competence in their teaching subjects. I argue that the overall effectiveness of any teacher rests on both: one's professional capability as well as his/her mastery of the teaching subjects. Hence, the overall Staff Development Programme in a school situation consists of professional development of teachers, teachers development (with

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not much difference between the two in the strict sense of the terms) and Adult Learning.

Thus:



The rectangle represents Staff Development as a broad organisational programme - a whole set within which teachers agree to work together for their professional growth and development, and the circles inside represent professional development, teacher development and adult learning as subsets. These subsets have something in common. The Professional Development programme in our school is being implemented under such a mechanism as illustrated above.

Secondary sources throw some light on staff development which are worth-noting. For example, Oldryod et al define Staff Development as:

Staff Development is the employment of talents, resources and professional needs of individuals, groups and the school as a whole.

In a school situation, the professional development of teachers is a process of change, which involves the adoption of new ideas, implementation of those ideas and continued use and modification of those ideas for effective teaching and learning.

Teacher development, on the other hand, focuses on the process of reflection, examination and change, which lead to doing a better job, and to personal and professional growth. Since development is common to both the concepts, it is to be considered as a long term evolutionary process. In both the processes - professional development and teacher development - teachers can be encouraged to grow to explore new avenues and ideas.

Any professional enhancement is: educating rather than training to

- become independent learners
- develop oneself to learn to adapt to different situations
- learn to set objectives
- define problems
- generate hypothesis, gather information, make decision and assess outcomes
- prepare teachers to make choices.

WHY IS PROFESSIONAL DEVELOPMENT FOR TEACHERS NEEDED AT ALL?

Tagore's lines cited above answer this question, although the question itself is slightly an absurd one to be asked to a teacher. Living in an age rightly described as the age of explosion of knowledge, thanks to the information revolution, facilitated by the rapid growth in Information Technology, the gap between the teachers and the taught is narrowing faster than ever before. One of the senior-most educationists of Bhutan, Dr. Jagar Dorji (currently the director of the NIE, Paro) addressing the teachers during an NBIP workshop at Punakha said:

The narrower the knowledge gap between the teacher and the taught, the more insecure the teachers ought to feel, both job security-wise and psychologically.

One of my colleagues shared during an SBIP meeting, a Malayalee educationist's view on the double death of a teacher. Some teachers, he recalled his Keralee master claiming, die twice in their single lifetime! First, professionally, followed by the second, real biological death. While the normal death i.e. the biological death is natural due to ageing or illness, the other more abnormal death is due to the sheer idleness of teachers to upgrade and update themselves with fresher ideas and better teaching-learning technology. Obviously, the first death is untimely and can be prevented if teachers believe in lifelong learning and experimenting.

Professional Development of teachers in a school context is important in today's situation because of the following reasons:

- To keep oneself well informed and abreast of the latest developments in the field of education, in general, and teaching-learning, in particular.
- To become effective teachers by not only teaching and repeating what has been prescribed in the syllabuses but also by becoming creative inspirers.
- To remain well informed of the latest educational objectives and policies like changes in the curriculum, changes in assessment policies and practices, changes in policy guidelines, new trends in the national education policy brought about by the government etc.
- To cope with the changing demands/expectations of the government, community and parents.
- To equip students to face the challenges brought about by the rapid changes like globalisation, information technology etc.
- To upgrade one's qualification so that the teacher concerned is more efficient and confident to impart knowledge, skills, values and attitudes to his/her pupils.

- To do justice to the chosen profession by performing it with competence so that the teacher concerned feels secure in the job.
- To carry out educational research from one's own experiences of teaching and learning, especially classroom technology-based work, and experiment with indigenous ideas, which, if found practicable, can be shared with others in the same field.
- Collect data, publish them, provide feedback and participate in curriculum development that is more relevant to the needs of the clients (pupils).
- Socialise with other teachers, share ideas by participating in discussions pertaining to national issues like deterioration of the general standard of English or learning difficulty in mathematics etc.
- To promote teacher co-operation within the school situation, thereby learning and benefiting from each other.
- To save resources/cost in sending/training people outside by incurring huge expanses.
- To create subject-based departments and self-help groups within the school for more interaction amongst teachers.
- To encourage teachers to spend leisure and free time doing something useful and constructive.
- To develop human resource in the school.
- For psychological reasons like self-fulfilment, a sense of achievement, self-actualisation.
- Others...

What strategies/activities are planned? Which of these are being carried out currently in DHS?

Although ambitious plans were prepared at the time of the inception of the Staff Development Committee two years back to be achieved eventually, very few could be carried out effectively. The challenges faced are discussed in the latter part of the paper. The following activities had been planned and strategies adopted:

- Holding/conducting School-based In-service Programmes (SBIP) based upon the needs of the teachers. Some teachers who will have attended National-based In-service Programmes to induct teachers in various subject-based activities and policy changes. These teachers could facilitate the sessions at schools and share ideas with others.

In Drukgyel, for example, SBIPs on Quality Wholesome Education, Values Education, infusion of Environmental Education across the curriculum, School Health, Intervention Cycle, Career Guidance and Counselling, School Agriculture Programme, Computer Education and IT, Scouting Programmes and Outdoors Education have been planned and conducted over the last two years to build the capacities of other teachers who are not too confident in these areas.

- Promotion of Computer Literacy among all the teachers including Dzongkha language teachers.
- Institutionalising of School-based Monitoring Support Services, initiated by EMSD.

- Hooking up the school computer with WWW and enabling teachers to access relevant information from the various web sites, which can be used as teaching - learning materials.
- Enrichment of school library by procuring books based on different subjects that can be used by teachers as reference books as well as by students as supplementary readers.
- Subscribing to educational journals, magazines, newspapers and other documents for the teachers to read.
- Planning and holding seminars, symposia, debates and discussion sessions to share ideas and make decisions.
- Displaying on a board relevant material like the CAPSD Newsletter, Educational bulletins, circulars, important notices, announcements and orders, Educational Policy Guidelines, brochures and leaflets for teachers to read.
- Implementing Inter-vision cycle among teachers to share teaching skills.
- Inviting guest speakers to enable teachers experience new ideas on diverse issues.
- Organising informal gathering like 'pot luck' dinners/lunches - a forum where teachers share food and experiences together.
- Enabling teachers to speak during the morning assembly on anything that interests them and the students (every Wednesday morning)
- Encourage teachers to involve in writing research and reflection-based papers to be published in educational journals as CERD's *Rabsel*.
- At a different level, rewarding promising teachers by nominating them for further education and training.
- Entrusting teachers with responsibilities within the school like Examination Committee Co-ordinators, Accounts Maintenance, School Mess in-charge, Sports co-ordinators and many such roles that a teacher ought to play in his/her capacity which indirectly help those teachers to improve their professional capabilities.
- Distance learning/ adult learning programmes for teachers enrolling themselves to upgrade their academic qualifications and professional diplomas and degrees.

Challenges and Prospects

While, planning and preparing various activities and high-sounding strategies is one thing, being able to implement them effectively is a totally another issue, for it is purely up to an individual to choose to enrich oneself or to remain content with and complacent about what one is or knows. Especially when it comes to adult learning, enforcement is counter-productive.

There are various factors that motivate adults to learn. There are also equally a good number of factors which impair adult learning. Within the school context, the following are some of the challenges that are to be faced while effectively implementing Professional Development programmes for teachers:

1. Lack of motivation among teachers due to differences in outlook, up-bringing, differences in the type of education and training acquired, age differences, cultural differences, and lack of thirst for lifelong learning.
2. Time constraint due to heavy teaching load at school (due to insufficient subject teachers), need to correct students' work and maintain records, need to shoulder

other responsibilities related to co-curricular and pastoral activities, especially in a boarding school, combined with family obligations at home.

3. Unavailability of resources, fund and facilities to carry out the planned activities.
4. Shortage of expertise or skills amongst teachers to carry out the proposed activities effectively.
5. Voluntary nature of some of PD activities leaves a big gap in the system as there will be no enforcement from authority. Teachers easily stay away from participating in certain programmes.
6. Adult psychology is different from child psychology. It is not only sensitive to ask someone to develop professionally, but it is also difficult to tell them so.
7. Lack of assessment and evaluation body as well as mechanism for professional development.
8. Lack of incentives in real material terms discourages some to develop themselves.
9. Lack of prompt and proper communication between schools and the various educational agencies.
10. Complacency, lack of competition and dearth of urge for self-improvement, especially in terms of learning new things.
11. A sense of strong feeling of job security once in the job.
12. Lack of support and encouragement from higher authorities, to some extent.

Prospects

Whatever constraints and challenges act as hurdles in carrying out PD programmes in schools, days of ease and complacency are nearing their end. Compared to the situation ten years back, there are remarkable changes in every sphere of Bhutanese life. Unemployment, unheard of before in Bhutan, has become a burning issue today. Being content with a little learning and a few skills assured us of our job security ten years back, but not any more.

University graduates have become common products in our country now! Rather than dwelling upon who we are, it is time to ask what we are. This requires learning and updating ourselves continuously. All the teachers should embrace life-long education as their philosophy of life. Professional Development Programme ought to be a part of every school's master plan, outlined in its mission and vision.

The Government, society and parents as clients are interested in quality products. School, being an enterprise and learners being the products, their qualities depend directly upon the quality of its teachers. The quality of teachers, in turn, has a direct bearing on how a school views the Professional Development of its teachers, what activities are promoted for sharpening their professional edges and how effectively these activities are implemented within the existing limitations.

It may be appropriate to modify and assert what Mr. T.S. Powdyel, the former Vice Principal of Sherubtse College and the current director of the Centre for Educational Research and Development once said of a university graduate:

A graduate of yesterday who stops learning today will become uneducated tomorrow.

Of a teacher, it may be modified and stated as:

A trained teacher of yesterday who stops learning today will become outdated and ineffective tomorrow.

Attitude of Grade VIII Students towards Bhutanese History

- Karma Tenzin

ABSTRACT

The purpose of this study was to assess Grade VIII students' attitude towards Bhutan History as an individual school subject and in relation to other school subjects. This study also explored the factors affecting students' attitude towards Bhutan History. The study population consisted of 344 students and eight history teachers in Trashigang district. Both quantitative and qualitative data were collected and analyzed in the study. The School Subject Attitude Scale (SSAS) developed by Alberta Education was used as the principal quantitative data collection instrument. This scale is designed to assess student's attitudes towards school subjects. Demographic data were also collected on the teachers and students involved in the study. Focus group interviews were conducted with six students (three boys and three girls) randomly selected from volunteers in each school.

The techniques used for analysis of the quantitative data were: descriptive statistics, analysis of variance (ANOVA), test for differences, and multiple regression. In terms of the focus group data, interviews were recorded, transcribed and thematic analysis was conducted on the transcripts.

Although the results of the SASS revealed that students had generally favourable attitudes towards Bhutan History, students rated history as the least important when compared to other subjects both on the instruments and when asked to rank subjects during the focus groups. Regression analysis demonstrated that students liked history better and perceived it to be easier when taught by teachers with academic majors in history. They were more likely to perceive history as important if taught by teachers with considerable experience in teaching history. Focus group data indicated that a number of factors across three contexts (the classroom, school system and society) seemed to be fundamental in shaping student attitude towards Bhutan History.

Background

Bhutan is popular for its unique culture and traditions. Bhutan History, which is a part of the social studies curriculum in school, plays a vital role in educating our students about the rich cultural heritage and traditions that have been developed and passed down by their ancestors. The Government places great emphasis on strengthening and continuing this rich culture and tradition.

Lyonpo Sangay Ngedup, Minister for Health and Education wrote in 1998 that *Bhutan's history should (then) teach us and our children to be proud and responsible citizens of one united nation. This Course Book (grade eight Bhutan History) will help teachers to realize these aims and will encourage them to stimulate our children to become fully aware, and to understand the importance of the past while at the same time strengthening and continuing our rich culture and tradition into future.* (CAPSS, 1998, p.iii)

The Purpose of the Study

The purpose of this study was to assess grade eight students' attitudes toward Bhutan History in relation to other subjects and also to explore the factors affecting their attitudes.

Research Question

The main research question was: what were grade eight students' attitudes toward Bhutan History?

Sub-questions were:

1. Do grade eight students regard Bhutan History as interesting, important and easy?
2. How does attitude towards Bhutan History compare to attitudes towards other key subjects including Dzongkha, English, and Mathematics?
3. How do grade eight students rank Bhutan History in relation to other subjects like Dzongkha, English, and Mathematics?
4. What are some of the factors which seem to influence grade eight students' attitudes toward Bhutan History?

Approaches

I have used two methods for data collection: 1) survey and 2) focus group interview.

1) **The Survey Questionnaire** was distributed to 344 students in eight schools. The questionnaire was developed by Albert Education to assess the school subjects and is called School Subject Attitude Scale (SSAS). The scale has three dimensions: evaluation, importance, and difficulty.

Each scale contains eight bi-polar pairs with each pair measured on a five-point scale. The evaluation scale for measuring one student's liking for a subject has values ranging from 1, representing the most negative feelings, to 5, corresponding to the most positive feelings. The score range for each scale is 8 to 40. A score of 24 on a scale represents a completely neutral score. Any score above 24 indicates a general positive feeling toward a subject. Similarly, any score below 24 represents a negative feeling. In addition to the SSAS, demographic data was collected for both the teachers and students.

Evaluation scale

awful	1	2	3	4	5	nice
boring	1	2	3	4	5	interesting
unpleasant	1	2	3	4	5	pleasant
dislike	1	2	3	4	5	like
dull	1	2	3	4	5	bright
dead	1	2	3	4	5	alive
listless (inactive, lazy)	1	2	3	4	5	lively
tiresome (makes a person feel tired)	1	2	3	4	5	exciting

2) Focus group interviews

To explore the factors affecting the students' attitudes, focus group interviews were conducted with 6 participants (3 boys and 3 girls) randomly selected from volunteers from each school. The interview was conducted after class hours for the duration of forty-five minutes so students would not miss classes. One interview was conducted in each school.

During the interviews, I noticed that the interview process did not progress as I expected. The participants did not really discuss 'among themselves, but instead restricted their responses to the questions asked by the researcher. This may have been due to the language problem experienced by the students.

Survey results

1. Evaluation

The mean and standard deviations showed positive evaluation towards all the subjects, all the means were above the theoretical mean of 24. All the means were above 31, indicating solidly positive feelings.

Table 4.1 Students' Attitude Towards Subjects

	N	Min.	Max.	Mean	Std. Deviation
attitudes/Dzongkha	320	16.00	40.00	33.6062	4.1297
attitudes/English	319	14.00	40.00	31.6458	4.4633
attitudes/History	334	17.00	40.00	32.9701	4.8042
attitudes/Mathematics	331	9.00	40.00	31.6224	5.8806
Valid N (list-wise)	291				

ANOVA was conducted to determine if there were significant differences between responses made among the three scales (evaluation, importance, and difficulty, of English, Dzongkha, and Mathematics) and that of Bhutan History.

Students' evaluation of School Subjects

The ANOVA results showed that the differences among the means of evaluation are statistically significant. However, it should be noted that even though the difference in student evaluation of the subjects did not occur by chance, the range is still very small - less than 3 points separate the highest and lowest means.

Table 4.1

Student Attitude Towards Subjects

	N	Min.	Max.	Mean	Std. Deviation
Attitudes/Dzongkha	320	16.00	40.00	33.6062	4.1297
Attitudes/English	319	14.00	40.00	31.6458	4.4633
Attitudes/History	334	17.00	40.00	32.9701	4.8042
Attitudes/Mathematics	331	9.00	40.00	31.6224	5.8806
Valid N (list-wise)	291				

Table 4.2

One-way ANOVA for students' attitude towards English, Mathematics, and Dzongkha compared to Bhutanese History

		SS	df	MS	F	Sig
attitude/English	Between groups	1408.365	22	64.017	4.171	.000
	Within group	4435.122	289	15.346		
	Total	5843.487	311			
attitude/Maths	Between groups	2172.244	22	98.738	3.273	.000
	Within group	9051.626	300	30.172		
	Total	1223.870	322			
attitude/Dzong	Between groups	938.445	22	42.657	2.871	.000
	Within group	4293.167	289	14.855		
	Total	5231.612	311			

2. Importance

The mean and standard deviations on perceptions of importance showed that the students found all the subjects important as the means were above the theoretical mean of 24. Again, all the means were above 31, indicating that all the subjects are important.

Table 4.4 Students' Perceptions of Importance Towards Subjects

	N	Min.	Max.	Mean	Std. Deviation
Attitudes/Dzongkha	324	18.00	40.00	35.8920	3.6262
Attitudes/English	326	11.00	40.00	35.1503	3.6592
Attitudes/History	332	13.00	40.00	33.0241	4.5954
Attitudes/Mathematics	329	15.00	40.00	34.9726	4.0420
Valid N (list-wise)	295				

Students' Perception of the Importance of School Subject: The ANOVA result showed that the differences in perceptions of importance are statistically significant. Again the means are very similar.

Table 4.4 Students' Perceptions of Importance Towards Subjects

	N	Min	Max	Mean	Std. Deviation
importance/Dzongkha	324	18.00	40.00	35.8920	3.6262
importance/English	326	11.00	40.00	35.1503	3.6592
importance/History	332	13.00	40.00	33.0241	4.5954
importance/Mathematics	329	15.00	40.00	34.9726	4.0420
Valid N (list-wise)	295				

Table 4.5

One-way ANOVA of students' perceived importance of English, Mathematics, and Dzongkha as compared to Bhutan History.

		<u>SS</u>		<i>MS</i>	<i>F</i>	<i>Sig.</i>
importance/ English	Between groups	1322.166	22	60.096	6.410	.000
	Within group	2756.553	294	9.376		
	Total	4078.669	316			
importance/ Mathematics	Between groups	1351.707	22	61.441	5.183	.000
	Within group	3509.083	296	11.855		
	Total	4860.790	318			
importance/ Dzongkha	Between groups	1146.372	22	52.108	5.208	.000
	Within group	2901.513	290	10.005		
	Total	4047.885	312			

3. Difficulty

The mean and standard deviations showed that the students feel generally favourable towards all the subjects because the means were above the theoretical mean of 24. But the means are not as high as the other two scales, which indicates that the students perceive the subjects to be neither easy nor difficult.

Table 4.6

Students' Perceptions of Difficulty Towards Subjects:

	N	Min	Max	Mean	Std. Deviation
difficulty/Dzongkha	317	13.00	40.00	29.3817	5.0060
difficulty/English	316	11.00	40.00	27.1329	5.0321
difficulty/History	336	11.00	40.00	28.9881	5.0949
difficulty/Mathematics	324	9.00	40.00	25.3056	6.0822
Valid N (list-wise)	279				

Students' Perceptions of the Difficulty of School Subject

The ANOVA result showed that the difference in perceptions of difficulty is statistically significant.

TABLE 4.7

One-way ANOVA of students' perceptions of difficulty of English, Mathematics, and Dzongkha compared with Bhutan History:

		<i>SS</i>		<i>MS</i>	<i>F</i>	<i>Sig.</i>
importance/ English	Between groups	2726.224	25	109.049	6.002	.000
	Within group	5178.413	285	18.170		
	Total	7904.637	310			
importance/ Mathematics	Between groups	2743.906	25	109.756	3.544	.000
	Within group	9012.813	291	30.972		
	Total	1756.719	316			
importance/ Dzongkha	Between groups	1997.108	25	79.884	3.890	.000
	Within group	5853.104	285	20.537		
	Total	7850.212	310			

ii. Multiple regression

A stepwise multiple regression was conducted to explore possible reasons for the significant difference in students' attitude, perception of importance, and perception of difficulty in Bhutan History

Evaluation

- Criterion variable - students' evaluation of school subject.

- Predictor variable -teachers' academic major, years of teaching experience, and years of History teaching experience.
- Result - Students' liked Bhutan History better when taught by teachers with academic majors in History. The coefficient of determination (R^2) indicates, however, that only about three percent of the variability of the two variables is shared.

Importance

- Criterion variable - students' perception of importance of school subject.
- Predictor variable -teachers' academic major, years of teaching experience, and years of History teaching experience.
- Results - Students' were more likely to perceive Bhutan History as important if taught by teachers with considerable experience teaching History. The coefficient of determination (R^2) indicates, however, that only about four percent of the variability of the two variables is shared.

Difficulty

- Criterion variable - students' perception of difficulty of school subject.
- Predictor variable - teachers' academic major, years of teaching experience, and years of History teaching experience.
- Results - the students perceived Bhutan History to be easier when taught by teachers with academic major in History. The coefficient of determination (R^2) indicates, however, that only two percent of the variability of the two variables is shared.

Interview results Ranking of Subject (n = 30)

Ranking *	Dzongkha	English	Maths	Science	B. History	Geog.
1	10	10	3	7	0	0
2	12	13	4	0	1	0
3	7	6	14	3	0	0
4	1	1	6	19	0	3
5	0	0	1	1	3	25
6	0	0	2	0	26	2

*(1= most liked subject, 6=least-liked subject)

Although students participated from eight schools across the district, analysis of the transcripts reveals strikingly similar factors which have shaped these students' attitudes toward Bhutan History as a school subject. These include teaching methods,

curriculum/textbooks, teacher background, status of Bhutan History, teacher attitude, parents' attitude, and Bhutan History and future prospects.

Classroom Context

Teaching methods: Most of the students consider Bhutan History boring because of their teachers' method of instruction. For example:

Jampel said: "I don't like History because most of the time our History teacher gives lecture. There is not much activities in History class."

Norbu said: "We always feel sleepy during History period because the History teacher keeps on lecturing sitting on the chair in front of the class."

Students preferred to be taught using a wide variety of interactive teaching methods. A change from the traditional lecture method to more activity-based methods may improve students' attitudes toward Bhutan History.

Curriculum materials and textbooks: The participants reported that the language used in History textbooks is often difficult to understand.

Dechen said: "Bhutan History is a difficult subject for me as the language used in some chapters is very difficult to understand and some chapters are quite confusing and complicated."

Tshering said: "I found Bhutan History too confusing and some terms used in the textbooks are difficult to understand."

It appears that the curriculum and the textbook affect students' attitude toward Bhutan History. Since students found the syllabi and the content difficult and even confusing, it is not surprising that they ranked Bhutan History as their least liked subject.

The School System Context

Teacher background: Teacher background includes ethnicity and academic qualifications of the teachers teaching Bhutan History.

Ethnicity

The difference in teacher ethnicity influences student attitudes towards Bhutan History.

Thinley said: "Our history teacher is a non-Bhutanese and he has been teaching History for so many years but he faces problem in

explaining some terminology written in Dzongkha. He teaches what is there in the textbook."

Even though I did not ask why the History teacher was interesting, it appeared that the Bhutanese teacher was better able to help the students understand the concepts.

Teachers' Academic Qualifications

The- teachers' academic background influenced students' attitudes towards Bhutan History and they preferred those teachers who have an appropriate academic background.

Bikash Rai said: "It seems our History teacher completed only grade ten so sometimes she faces problem in explaining the content in more detail."

Therefore, it appears that teachers who have a strong academic background for teaching Bhutan History have greater impact on their students' learning and attitude toward the subject. On the other hand, 'teachers with a lower level of academic preparation failed to develop in their students a positive attitude toward Bhutan History.

Status of Bhutan History

A majority of participants feels Bhutan History to be their least-liked subject. One of the main reasons for this dislike is History's status as a minor subject.

Sonam Tenzin said: "I like all the subjects but I give more importance to English, Dzongkha, and Maths because they are the main subjects. If we fail in one of these subjects, we are considered as failed."

Teachers' Attitude

Teacher attitudes confirmed this relative status of the subject and seemed to have a real impact on student attitudes toward Bhutan History.

Sonam Chodon'said: "History is not liked by most of the students because even the teachers in the school -of course, not the History teachers, but other teachers -when they enquire about the exam result, they will ask only about the other subject marks. They will not ask about the achievements in History.

Students seem to pay more attention to the subject depending on teachers' attitude. It also indicates that the teachers should recognize good performance regardless of the subject.

Social Factors

Parents' Attitude: Mostly parents lack formal education and do not seem to influence student attitude toward school subjects. However, some do prefer to have their children do well in certain subjects in order to get good jobs in the future.

Rinzin said: "My father always insists on me to give importance on science because he wanted me to become doctor or engineer in future".

Bhutan History and Future Prospects

This was also reflected on the SSAS results where History was regarded as the least useful subject compared to other subjects like English, Dzongkha, and Mathematics.

Pema said: "I don't like History because I don't think there is good future besides only becoming History teacher."

The majority of the students believed that science students will be in high demand and there will be many job opportunities.

Recommendations

Based on my findings, the following recommendations were made:
Bhutan History should be considered a major subject. The Bhutan History textbook should be reviewed and re-written in clear, simple language. In teaching Bhutan History, teachers should explore diverse activities such as role-playing, co-operative learning, discovery learning, and field trips to deliver a clear concept of the information dealt with in the classroom. Teachers with an academic degree should be assigned to teach Bhutan History. Bhutanese nationals should be assigned to teach Bhutan History.

* * *

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Study on the Practice of Screening Students before Board Examinations - EMSD

1. RATIONALE

In an examination-driven system of education like ours, examinations at the school and national levels have always been held with trepidation by those whose reputations are at stake. For the students, these examinations determine whether they move on to the next higher class or repeat for one more year. For the teacher, there may be the unwanted frown from the authorities if the result in his/her subjects is poor or none if the result is excellent. For the head of school, a good result is one more feather in his cap while poor results may cost him the headship. The stakes are high and the stakeholders many.

In this connection, in the last few years, the issue of screening students from appearing at the examinations has been causing considerable concern amongst various circles of parents, students and the education authorities. Many schools had are known to have disallowed academically weak students from sitting at the final board examinations in case the overall results are affected negatively.

The EMSSD was given the task of finding out if there have been such screening practices carried out by the schools through the 5th AEC recommendation *"The EMSSD to study the practice of screening out of students from sitting for the Board Examinations for classes VIII, X, and XII and present the findings to the next Annual Education Conference"*.

2. MODE OF STUDY

In 2002, the EMSSD collected data from various schools that had classes VIII, X and XII. To get a holistic picture, classes VII, IX and XI were also included in the study. All the LS, MS and HS schools were included in the study though some of them failed to send in the required information and data as per the questionnaires.

Out of the 110 LS, MS and HS schools in 2001, about 77 of them responded to the questionnaires. Out of these, some of the schools had been upgraded in the previous year or that year and some information required was not relevant to them and, therefore, available at the time. A few schools submitted incomplete information and, as such, the number of respondents changes with different data.

The study has focused on five main areas, namely, **student enrolment, school perception of examinations, examinations, school performance, factors affecting performance and, question patterns.**

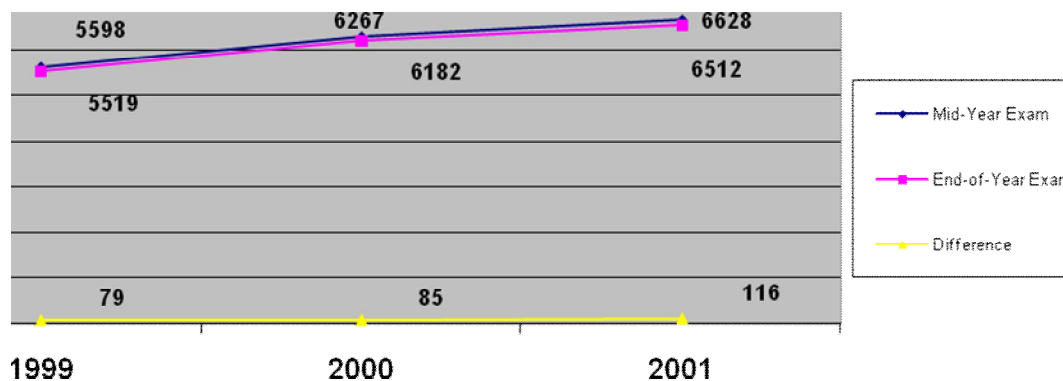
3. STUDY FINDINGS

3.1 STUDENT ENROLMENT: Are students screened out in any class by the schools?

Evidence: Difference in class strength between the Mid-Year and the End-of-Year Examinations for classes VII, IX and XII and between the Trial and the Board Examinations for classes VIII, X and XII.

Study on enrolment in the last 3 years shows some differences in student numbers between the Mid-Year and the End-of-Year Examinations. It can be safely assumed that the difference, if any, is due to the screening practice of schools or drop-out cases.

CLASS VII



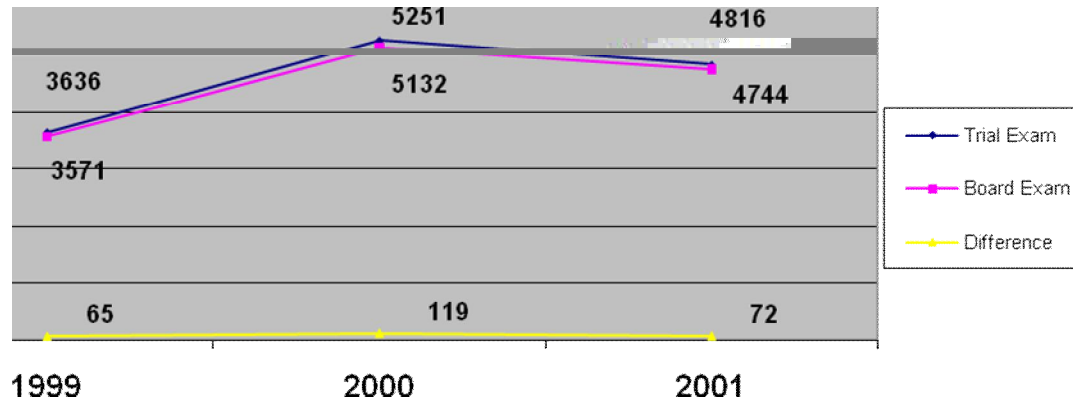
In 1999, in 31 out of 55 higher, middle, and lower secondary schools, there were slight differences in the number of students who appeared at the Mid-Year and the End-Year Examinations with a smaller number of students appearing at the latter examinations. The largest difference was 4% in one school where about 10 students out of 250 did not make it to the End-Year Examinations. In other schools, the difference was smaller. Overall, the difference stands at 1.41%.

In 2000, 29 schools out of 62 schools showed a difference, the largest being to the tune of 9% of the class when 8 students out of 90 did not make it to End-Year Examinations. The overall difference is 1.35%.

In 2001, 38 schools out of 69 showed a difference in the number, the largest being 26% (10 out of 38). The overall difference is at 1.75%.

The overall number of students detained is small but it has been increasing over the years though some part of this could be attributed to drop-out cases.

CLASS VIII



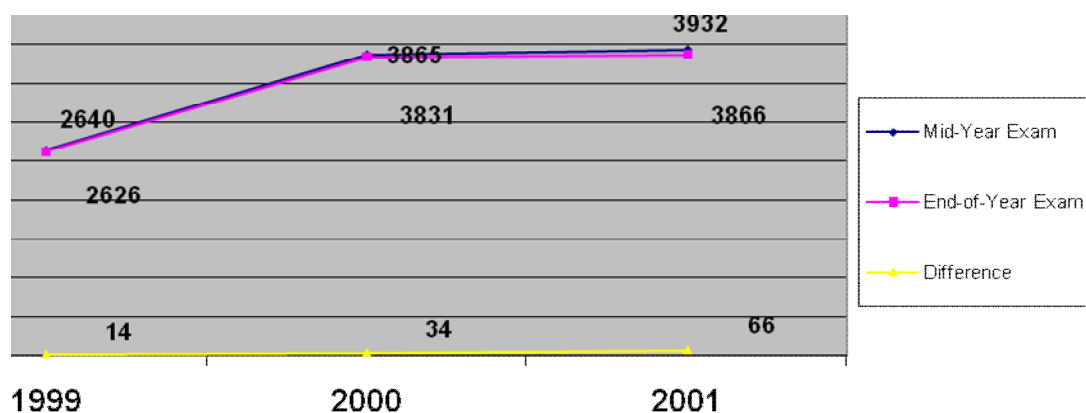
In 1999 in 13 out of 43 schools, there were some differences in the number of students who appeared at the Trial and Board Examinations. The largest difference was 10% in one school where about 13 students out of 130 did not make it to the Board Examinations. In other schools, the difference was smaller. The overall difference in percentage is 1.78%.

In 2000, 26 schools out of 56 showed some differences. The largest was 11% (11 out of 58 students). Overall, the difference is 2.26%.

In 2001, 21 schools out of 62 had differences, the largest difference being about 8% of one class. The overall difference is 1.61%.

The overall percentage of students detained in Class VII has been decreasing over the years. It is not a widespread practice but limited to some schools.

CLASS IX



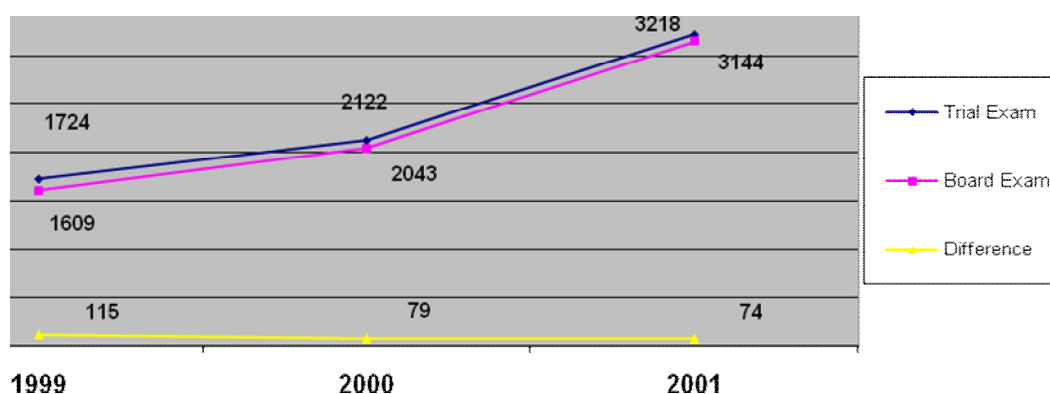
In 1999, in 8 out of 16 schools, there were small differences in the number of students at the beginning of the year and those that sat for the annual examinations. The highest difference was 4 students out of a total of 134 students. The overall difference is 0.53%.

In 2000, in 12 out of 20 schools, there were also small differences. The highest difference was 8 students out of a total of 169 students. The overall difference is 0.88%.

In 2001, in 14 out of 23 schools, there were small differences. The highest differences were 8 students out of a total of 172 students, 15 out of 302, and 5 out of 139. The overall difference is 1.67%.

The number of students being detained in Class IX is minimal but it has been increasing over the years.

Class X



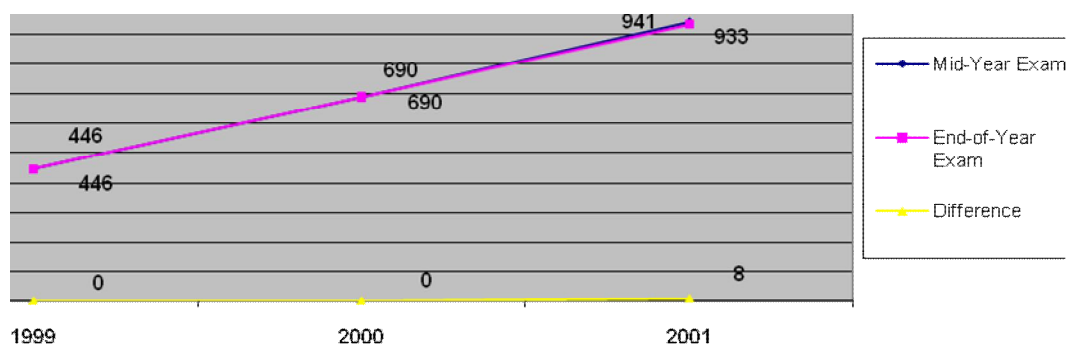
In 1999, in 8 out of 12 schools, differences in student strength in the trial and the external examinations were seen. The highest differences were 14% (42 students out of 282), 11.9% (23/193), and 9.7% (13/133). The overall difference is 6.67%.

In 2000, in 10 out of 15 schools, differences in student strength in the trial and the external examinations were seen. The highest differences were 12.5% (20 students out of 160), 10.8% (14/129), 10% (20/198), and 9.5% (10/105). The overall difference is 3.72%.

In 2001, in 11 out of 23 schools some differences were seen. The highest differences were 11% (12 students out of 107), 10% (14/131) and 8% (13/162). The overall difference is 1.59%.

The number of students detained in Class X has been steadily decreasing over the last three years.

CLASS XI



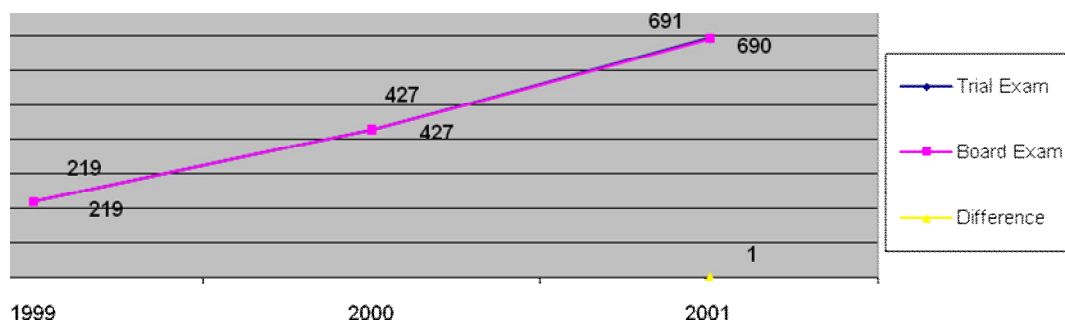
In 1999, in 4 schools, no difference in student strength was seen.

In 2000, 1 school out of 4 had a slight difference in student strength at the beginning and the end of year.

In 2001, 3 out of 5 schools had a slight difference in student strength.

Detention rate is very small or non-existent in Class XI.

CLASS XII



There was hardly any difference in student strength between the beginning and the end of the year in Class XII in any school. *There is no detention in Class XII.*

Summary

Class		1999	2000	2001
VII	Mid-Year Exam	5598	6267	6628
	End-Year Exam	5519		6182
	Difference	79	85	116

VIII	Trial Exam	3636	5251	4816
	Board Exam	3571	5132	4744
	Difference	65	119	72
IX	Mid-Year Exam	2640	3865	3932
	End-Year Exam	2626	3831	3866
	Difference	14	34	66
X	Trial Exam	1724	2122	3218
	Board Exam	1609	2043	3144
	Difference	115	79	74
XI	Mid-Year Exam	446	690	941
	End-Year Exam	446	690	933
	Difference	0	0	8
XII	Trial Exam	219	427	691
	Board Exam	219	427	690
	Difference	0	0	1

EVALUATION

Most schools do not have the practice of 'screening' students from writing their examinations. Screening has been carried out in some schools only. It is relatively higher for Class X where students sit for an external examination though other classes are also not spared. However, it is almost non-existent in classes XI and XII. Screening has been decreasing over the years for board examination classes (VIII & X) and increasing for internal examination classes (VII & IX). The number of students screened out may be higher than admitted by schools.

(See ANNEXURE 'A' for details)

RECOMMENDATION

In view of the *Education for All* policy of the RGOB, it is felt that screening of students from writing their examinations is unwarranted and schools should be advised against such a practice.

3.2 SCHOOL PERCEPTION ABOUT EXAMINATIONS

In this survey, filled-in questionnaires were received from 78 HS, MS and LS schools. The responses are compiled below.

a. What do good examination results mean to you (or the school)?

Good examination results stand for a cent percent pass accompanied by a few distinctions and more than half the class obtaining first division passes. Such results mean that there has been high quality teaching and learning in the school facilitated by

a full set of faculty members and good management practices. Both the teachers and students have worked hard.

Schools have high expectations that are not actually matched by actual performance.

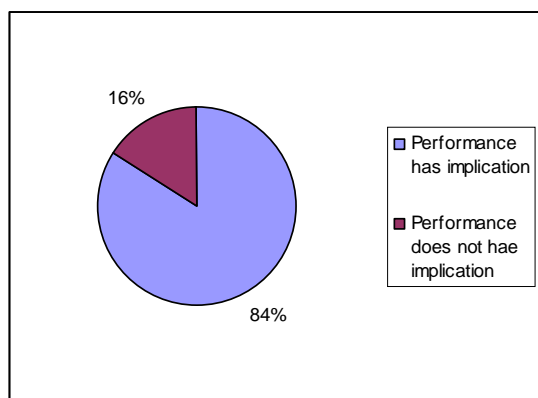
b. What are the implications for the school, if any, in your students sitting for such external examinations?

The reputation of the school is at stake, as it will be compared with other schools. If the examination results are good comparatively, then the school and the teachers are in good standing in the eyes of the public and the authorities. An external exam implies that the subject teachers will have to work harder and pay greater attention to these classes so that they obtain good results to be in the good books of the public and authorities. Special arrangements such as extra classes or coaching sessions have to be arranged so that the students are prepared well to sit for the external examinations. It also implies that all other factors that have a bearing on the examination results such as timely supply of sufficient books and stationery, sufficiency of subject teachers and classrooms have to be addressed to create an environment suitable for teaching and learning.

Schools take examination results as a yardstick by which they measure their own effectiveness and judge performance.

c. Do you, in any way, feel that performance of your students in the external examinations is going to:

(i) affect you as the subject teacher?



68 out of 78 teachers (84% think that the performance of their students in the external examinations affect them as the subject teacher. The teacher's capability, efficiency and efforts in profession are judged based on the performance by his students. Performance indicates whether the teachers have worked hard to make the students learn, whether the teacher is capable in teaching, able to make the students understand what is being taught.

Poor performance by students would mean that the teacher is incompetent and not able to convey clearly what he is teaching, and good performance would mean that the teacher has been able to make the students understand the concepts. Teachers also

get blamed for poor performance irrespective of the type and attitude of students and are answerable to higher authorities. Poor results also prompt the teachers to diagnose their own performances, teaching strategies and methods.

On the other hand, 12 out of 78 teachers (16%) feel that the performance will not affect the subject teacher as there is no incentive or reward for good results or punishment for bad results.

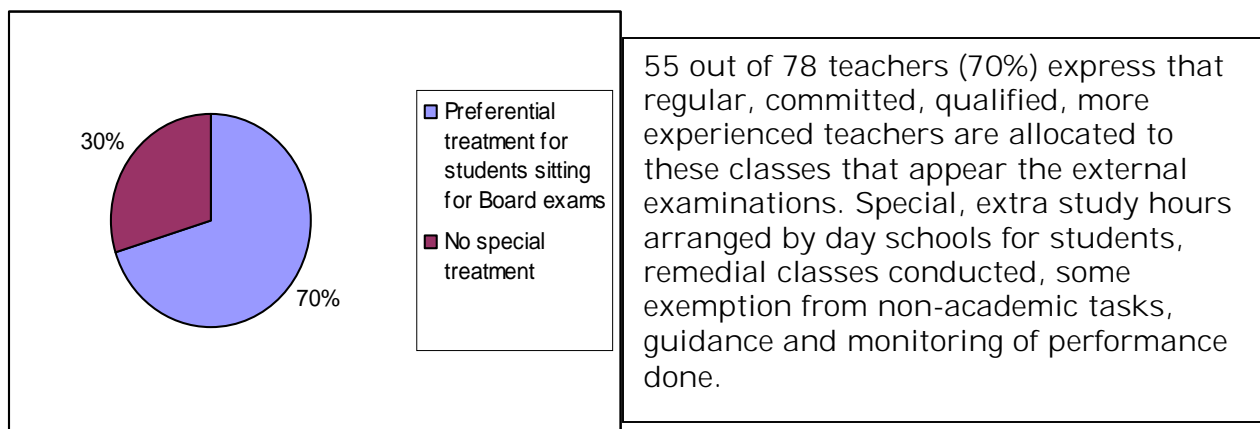
Most teachers opine that their performance is judged by examination results and attach a lot of importance to it.

(ii) affect the school?

68 out of 78 teachers (84%) are concerned that the performance of the students in the external examinations does affect the image of the school. Good results could mean that the school is effective in all areas, such as management, administration, curriculum implementation, professional development, assessment, etc. A school is still deemed better or worse based on the academic results alone. In the eyes of the public and the authorities, schools that produce good results are in their good books and those that do not are in the bad books irrespective of the various factors that may have affected these results.

9 out of 78 teachers (11%) think that no actions are taken in case of poor performance by schools in terms of academic results. Nobody is held responsible for poor performance by school and that there is no appreciation or recognition in case of good results.

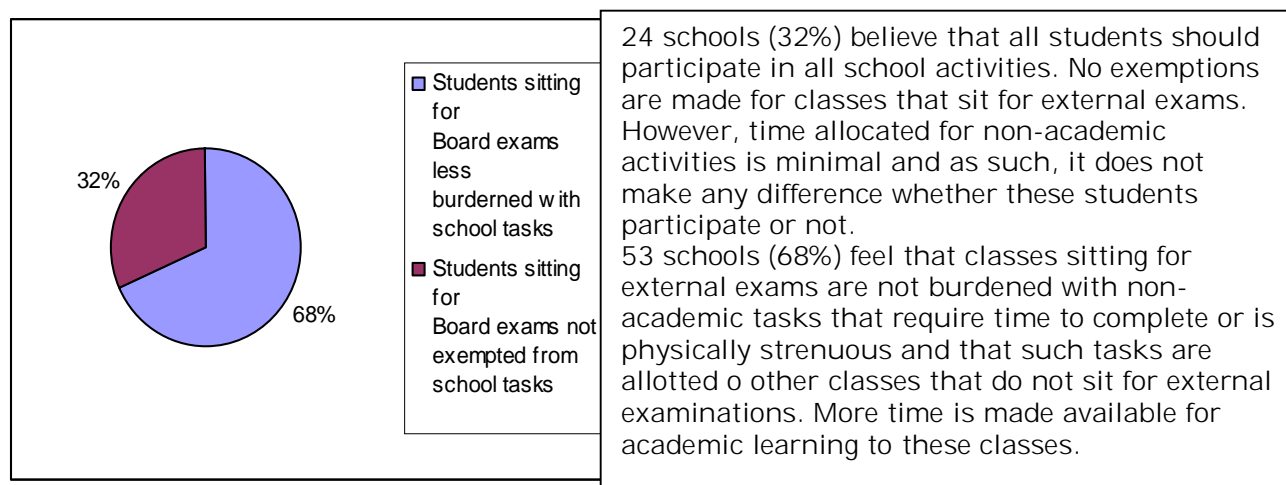
d. Has the school made any arrangement that give these classes the required advantage and facilities over the other classes in the school?



Concentration on coverage of syllabus, both qualitatively and quantitatively. Sufficient textbooks and references made available. Lessons well planned, tests conducted frequently.

On the other hand, 23 out of 78 teachers (30%) feel that all classes are treated equally in terms of allocation of resources, time, teachers, activities, etc as all classes are important. The external examinations are just a process and do not end with a year of special attention.

e. *Are students of these classes comparatively burdened with school tasks and activities other than academic learning?*



f. *How much time do these students get for learning/academic tasks in comparison to other classes?*

No additional time is created but as they are often exempted from co-curricular and extra-curricular activities, they get more time than other classes for academic tasks and learning.

g. *In view of these students having to sit for an external examination, how have you facilitated to give them more time for learning than for other classes?*

These classes are exempted from certain school activities and national level tournaments. The time saved is used in academic learning such as organized extra classes. Otherwise, such classes are squeezed between the school activities. Study hours organized. Advice on proper use of the available time is given to students.

h. *Are these classes given preference over the other classes in terms of staffing? Explain.*

Many schools feel that some preference is definitely given to these classes. More experienced, more qualified, dedicated, hardworking teachers allotted to these classes. Absence of teacher from these classes minimized or nil and contact time is maximized. These classes get the available teachers first if there is a shortage of staff.

i. *What arrangement has the school made to achieve best examination results in these classes? Explain in detail.*

Students are guided and advised individually by the teachers, leaving enough time for revision. Syllabus is covered in time. Special study hours arranged, homework monitored, frequent class tests are conducted to check learning. Administering model question papers to students. Monitoring of teachers' work in the classroom.

j. *Have such arrangements been made for the other classes that sit for the home examinations?*

64 schools (82%) think that classes that do not face an external examination are also given due attention so that they fare well in the home examinations.

Though all classes are deemed to be given equal importance, it is seen that focus is placed on classes facing an external examination and some preferential arrangements made to ensure good academic results from these classes.

k. *Was the school able to conduct regular classes for levels VIII, X, and XII? Explain in detail.*

Classes were conducted regularly for these classes by almost all the schools except when schools receive VVIP visits or when some students have to go to participate in out-of-school competitions in games and sports.

l. *Are classes for levels VIII, X, and XII more regular or less regular than for other classes?*

Many schools say that comparatively, classes for VIII, X, and XII are more regular though others say that all classes are regular.

m. *In allotting teachers, are classes VIII, X, and XII given priority over other classes? Explain.*

In many cases, teachers who have experience in teaching these classes get to teach these classes. However, the discrimination of classes in allocation of teachers and the teachers themselves in terms of capability or qualification is not stark.

n. *Which class(s) carries out the extra-curricular activities such as works/non-academic tasks/ programmes in the school?*

Many schools say that non-academic tasks and activities are carried out equally by all the classes irrespective of whether they have to face external examinations or not. However, some schools ensure that such tasks are carried out by students of other classes so that their colleagues sitting for an external examination get more time for academic learning.

o. *What works/non-academic tasks/programmes in the school are class VIII, X and XII students exempted from, if any?*

Generally, students sitting for an external examination are exempted from non-academic tasks towards the end of the year only. Such activities that they are exempted from are club activities, national and dzongkhag level tournaments, manual work, social work, agriculture, gardening, school fetes, etc. During class hours, these classes are not called when there is some urgent work to do especially in boarding schools.

p. Any other information you want to share:

There should be equal distribution of teachers, resources, and facilities amongst schools of the same category so that there are equal opportunities for students across the country. There should also be sufficient staff for all categories of schools. In terms of staffing, some schools have insufficient staff while others have surplus staff. There should also be sufficient support staff in every school such as gardener, sweeper, peon, etc. This would ensure that the students have more time for academic learning rather than non-academic tasks. There should be staff for all disciplines that the schools carry out; there should be separate staff that can handle physical education, arts and craft, cultural activities, computer education, music, etc.

There should be streaming of students according to their abilities and aptitudes from early on. Students who are good in sports should concentrate on them so that they develop in these areas while students who are academically oriented should be helped to pursue academic studies only.

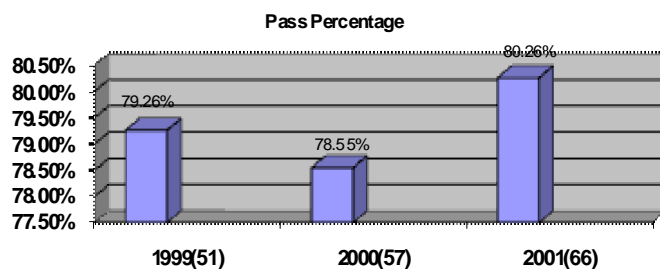
RECOMMENDATION

In view of the priority accorded to academic performance of students for employment and study opportunities, the importance accorded by schools to the examinations to ensure that students perform well is felt to be justified.

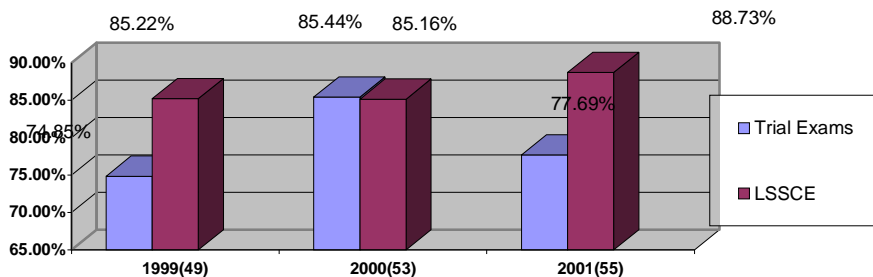
3.3 EXAMINATIONS

The following is an analysis of the examination results for the last three years.

Class VII: In 1999, the overall pass percentage of students in Class VII was 79.26%; in 2000 it was 78.55%; in 2001 it was 80.26%.

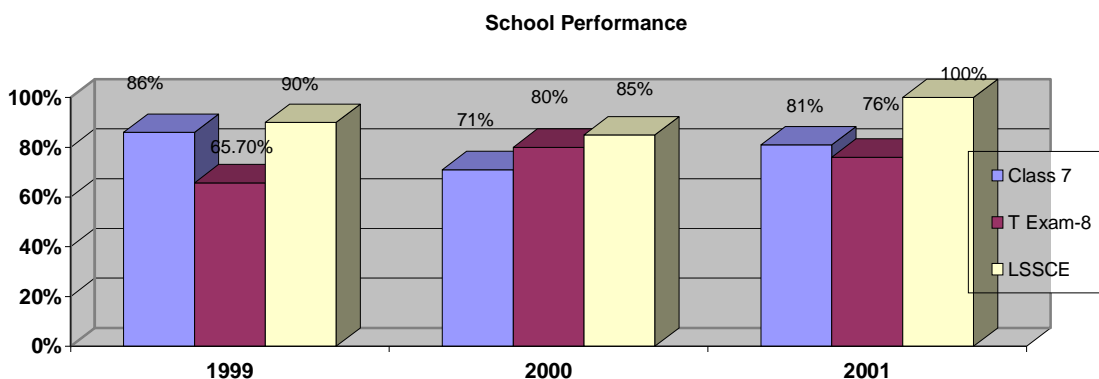


Class VIII: In 1999, the overall pass percentage of students in Class 8 trial exams was 74.85%; in 2000, it was 85.44%; in 2001, it was 77.69%. In the actual examinations (LSSCE), it was 85.22% in 1999, 85.16% in 2000 and, 88.73% in 2001.



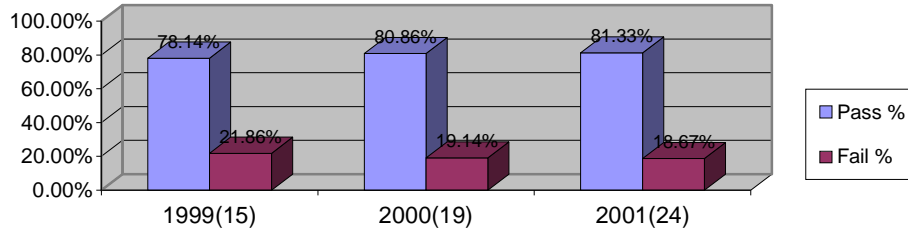
The schools seem to be strict in the trial examinations. Performance in the actual examinations seems to be better.

The policy on examinations is that at least 72% of the class should pass and go on to the next higher class. Accordingly, there are more schools performing well in the Board examinations than in the internal or home examinations. In 2001, all the schools obtained more than 72% pass in the LSSCE.



More schools seem to do well in the LSSCE than in Class VII. Promotion in Class VII seems to be controlled and there is probably some screening.

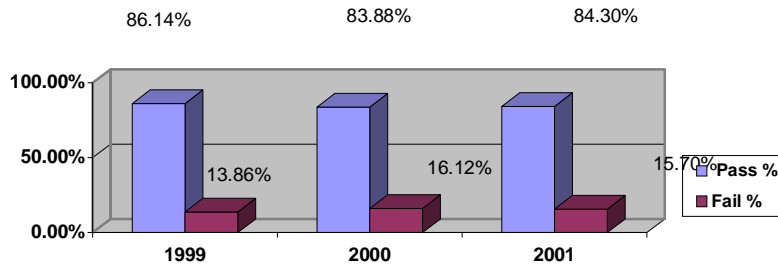
Class IX



1999				2000				2001			
Total	Pass	Fail	Pass %	Total	Pass	Fail	Pass %	Total	Pass	Fail	Pass %
2485	1942	543	78.14%	3700	2992	708	80.86%	4019	3269	750	81.33%

In 1999, about 78% students passed, in 2000 about 81% and in 2001 about 81%. ***The pass rate seems to below.***

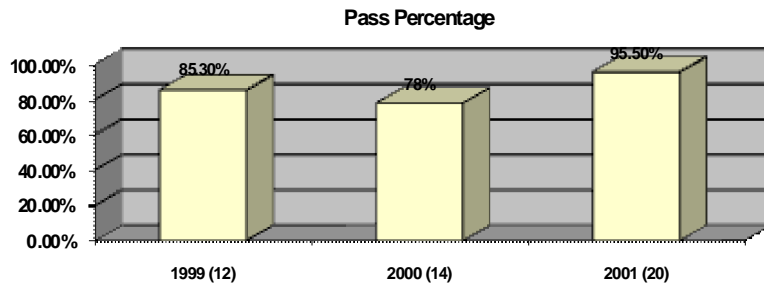
Class X - Trial Examination



1999				2000				2001			
Total	Pass	Fail	Pass %	Total	Pass	Fail	Pass %	Total	Pass	Fail	Pass %
1638	1411	227	86.14%	1942	1629	313	83.88%	3217	2712	505	84.3%

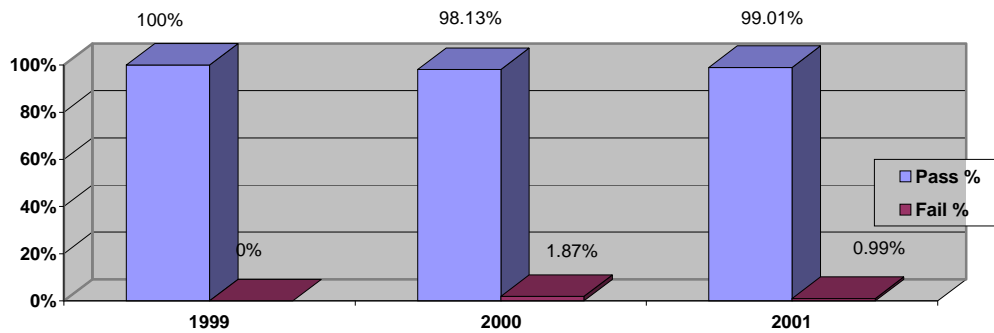
There is a higher number of students passing the trial examinations during the last three years.

Class X – Board Examination



1999				2000				2001			
Total	Pass	Fail	Pass %	Total	Pass	Fail	Pass %	Total	Pass	Fail	Pass %
1609	1373	236	85.3%	1948	1521	427	78%	2941	2823	118	95.5%

Class XI

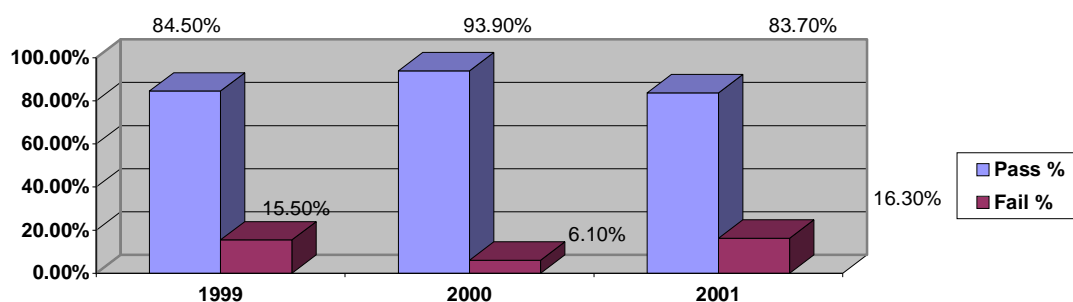


1999				2000				2001			
Total	Pass	Fail	Pass %	Total	Pass	Fail	Pass %	Total	Pass	Fail	Pass %
212	212	0	100%	321	315	6	98.13%	916	907	9	99.01%

The internal examination results for Class XI in the past years have been very good. There is hardly any student not making it to Class XII though the results in some subjects are not laudable.

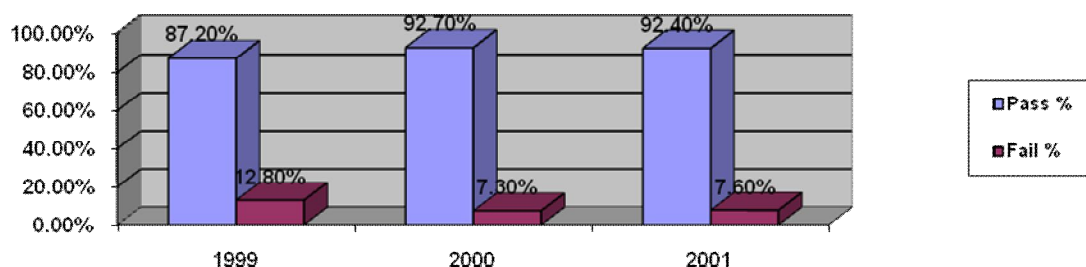
Students in Class XI seem to do well in the examinations.

Class XII – Trial Examination



1999				2000				2001			
Total	Pass	Fail	Pass %	Total	Pass	Fail	Pass %	Total	Pass	Fail	Pass %
232	196	36	84.5%	449	422	27	93.9%	683	572	111	83.7%

Class XII – ISC



1999				2000				2001			
Total	Pass	Fail	Pass %	Total	Pass	Fail	Pass %	Total	Pass	Fail	Pass %
219	191	28	87.2%	427	396	31	92.7%	690	638	52	92.4%

Summary

Class	Pass %		
	1999	2000	2001
Class VII	79.26%	78.55%	80.26%
Class VIII – Trial Exam	74.85%	85.44%	77.69%
Class VIII - Board Exam	85.22%	85.16%	88.73%
Class IX	78.14%	80.86%	81.33%
Class X – Trial Exam	86.14%	83.88%	84.3%
Class X- Board Exam	85.3%	78%	95.5%
Class XI	100%	98.13%	99.01%
Class XII – Trial Exam	84.5%	93.9%	83.7%
Class XII - ISC	87.2%	92.7%	92.4%

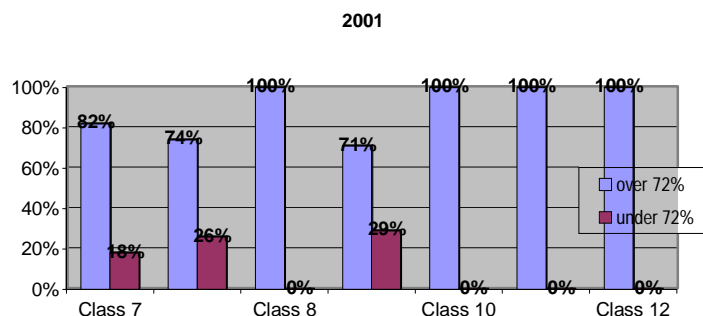
The percentage of students passing the board examinations in classes VIII, X, and XII is higher than in the home examinations of classes VII and IX. Pass percent in Class XI is, however, the highest of all.

Recommendation

Greater accountability must be placed on schools and teachers for the results of examinations.

(See ANNEXURE 'B' for details)

3.4 SCHOOL PERFORMANCE



	Class 7		Class 8		Class 8		Class 9		Class 10		Class 11		Class 12	
	72% +	72% -	72% +	72% -	72% +	72% -	72% +	72% -	72% +	72% -	72% +	72% -	72% +	72% -
1999	36/51	15/51	22/35	12/35	35/39	4/9	9/15	6/15	9/12	3/12	4/4	0/4	3/4	1/4
	71%	29%	63%	37%	90%	10%	60%	40%	75%	25%	100%	0%	75%	25%
2000	44/57	13/57	40/50	10/50	46/53	7/53	15/19	4/19	9/14	5/14	4/4	0/4	4/4	0/4
	77%	23%	80%	20%	87%	13%	79%	21%	64%	36%	100%	0%	100%	0%
2001	55/67	12/67	41/55	14/55	56/56	0/56	17/24	7/24	20/20	0/20	5/5	0/5	4/4	0/4
	82%	18%	74%	26%	100%	0%	71%	29%	100%	0%	100%	0%	100%	0%

72% +: Schools achieving more than 72% pass.
less than 72% pass.

72%- : Schools achieving

The number of schools performing well has been increasing over the years. More schools did well academically recently than in previous years. More schools are achieving more than 72% pass in the various classes. In 2001, all schools surveyed have achieved this for classes VIII, X, XI, and XII.

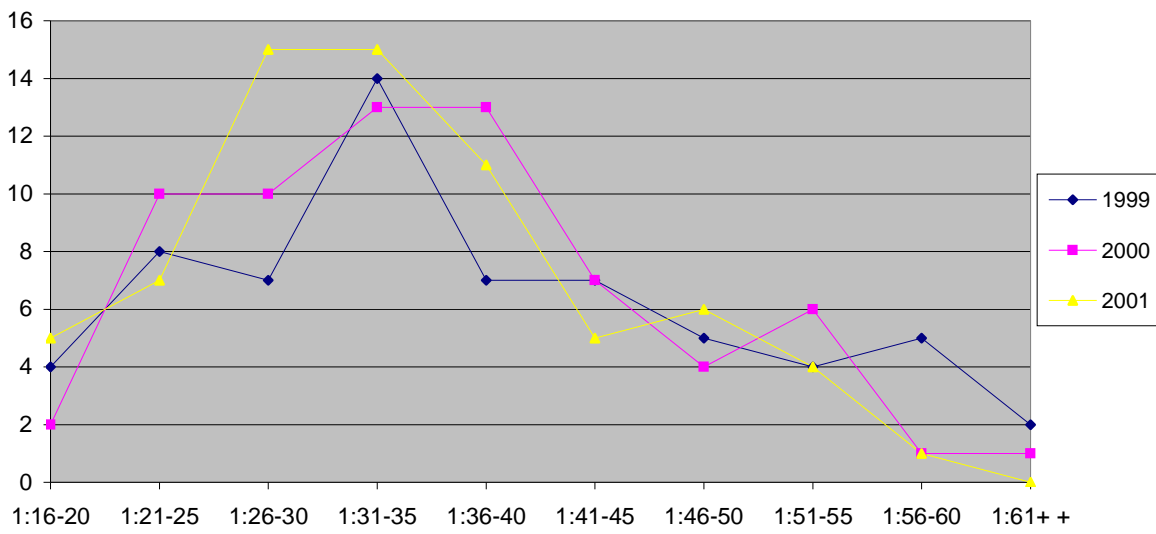
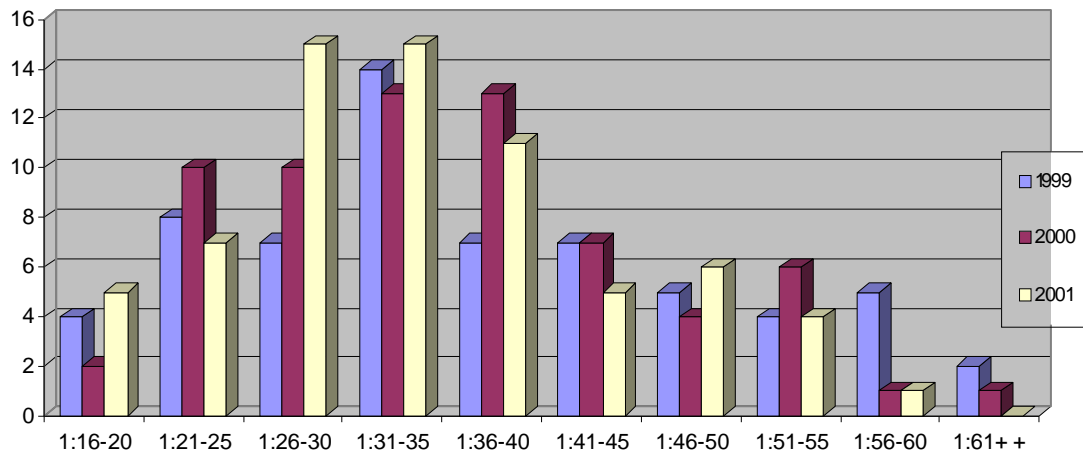
Recommendation

The variables must be carefully studied before schools are booked for poor performance.

(See ANNEXURE 'B' for details)

3.5 TEACHER - PUPIL RATIO

A. TRENDS



Range	1 : 16 - 20	1 : 21 - 25	1 : 26 - 30	1 : 31 - 35	1 : 36 - 40	1 : 41 - 45	1 : 46 - 50	1 : 51 - 55	1 : 56 - 60	1 : 61 + +
1999 (63)	4	8	7	14	7	7	5	4	5	2
2000 (67)	2	10	10	13	13	7	4	6	1	1
2001 (69)	5	7	15	15	11	5	6	4	1	0

Our classrooms do seem to be becoming smaller and the imbalance between the number of schools having smaller teacher-pupil ratios and those having larger ones seem to be reducing over the years. There are very few schools with small or large ratios. A bulk of our schools seems to have teacher-students ratio of 1 : 32.

(See ANNEXURE 'C' for details)

B. EXAMINATION AND TEACHER-PUPIL RATIO

Range Year	1 : 30 and below (but under-performed)	1 : 50 and above (but performed well)
1999	8 schools	6 schools
2000	9 schools	4 schools
2001	3 schools	3 schools

The size of the class does not seem to affect the performance by a class. Schools that had large teacher – pupil ratio did not necessarily mean that they did not do well in the examinations. On the other hand, schools with smaller ratios did not necessarily mean that they do well in the examinations. A direct cause-effect relationship between school performance and TP ratio cannot be firmly established.

Recommendation

The belief that smaller classes guarantee good examination results could be a myth. School performance may not be pegged to TPR.

(See ANNEXURE 'D' for details)

3.6. EXAMINATION QUESTION PATTERNS

1. Time: Generally, the time for writing the annual examination papers is in keeping with the rules of examinations. However it is not consistent in all schools for some subjects. Physics paper for Class IX in one school is of 1½ hours duration and 2 hours in another. Similarly, time for writing the examination in mathematics is different. One school has it for 2 hours and another has it for 2 ½ hours.

Schools need to follow the time duration for the examinations for various subjects strictly. It is necessary to bring about uniformity in the examination system.

2. Accuracy: The examination papers have many mistakes that mar. There are many examples of such mistakes, which cannot be printed here for reasons of professionalism and propriety.

Moderation of question papers prior to finalizing is necessary to eliminate spelling mistakes, typographical errors, grammatical mistakes, etc.

3. Pattern: Question patterns for examinations at the school in most cases, are akin to the board examination and Council paper patterns across the various subjects with respect to the type of questions and the number of parts (section) to the paper, the number of questions to be answered in each part, the marks each part is worth, the type of questions in the different parts, etc. In Class XI, they are in keeping with the ISC council directives. A few variations could be seen in the allocation of marks to the different questions in a few papers.

Recommendation

Schools need to adopt the good practices of a sound examination system.

(See ANNEXURE 'E' for details)

4. RECOMMENDATIONS STUDENT ENROLLMENTS

- In view of the Education for All policy of the RGOB, it is felt that screening of students from writing their examinations goes against this policy and schools may be desisted from doing it.

SCHOOL PERCEPTION ABOUT EXAMINATIONS:

- In view of the priority accorded to academic performance of students for employment and study opportunities, the importance accorded by schools to the examinations to ensure that students perform well is felt to be justified.

EXAMINATIONS:

- Greater accountability must be placed on schools and teachers for the results of examinations,

SCHOOL PERFORMANCE:

- The variable must be carefully studied before schools are booked for poor performance.

TEACHER-PUPIL RATIO

- The belief that smaller classes grantee good examination results could be a myth. School performance may not be pegged to TPR.

EXAMINATION QUESTION PATTERNS:

- Schools Need to adopt the good practices of a sound examination system

COMPARATIVE STUDY - Student Enrolment 1999

SI	School	Class 7			Class 8				Class 9			Class 10				Class 11			Class 12			
		MY E*	EY E*	Dif f.	TO T*	TE*	BE X*	Dif f.	MY E	EY E	Dif f.	TO T	TE	BE X	Dif f.	MY E	EY E	Dif f.	TO T	TE	BE X	Dif f.
1	Damphu HSS	114	114	0	73	73	69	4	104	103	1	135	133	120	13	-	-	-	-	-	-	-
2	Drukgyel HSS	84	84	0	67	65	65	0	193	193	0	175	171	170	1	69	69	0	66	66	66	0
3	Gyelpozhing HSS	138	136	2	169	169	156	13	134	130	4	37	37	34	3	-	-	-	-	-	-	-
4	J/Sherubling HSS	-	-	-	-	-	-	-	292	299	-7	290	282	240	42	76	76	0	37	37	37	0
5	Nangkor HSS	162	159	3	140	140	140	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	Punakha HSS	46	45	1	40	40	36	4	231	226	5	209	209	193	16	67	67	0	67	67	67	0
7	Rangjung HSS	37	37	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Ugyen Dorji HSS	222	220	2	262	258	242	16	138	134	4	126	125	126	-1	-	-	-	-	-	-	-
9	Zhemgang HSS	45	45	0	42	42	39	3	239	239	0	193	193	170	23	-	-	-	-	-	-	-

10	Kelki HSS (Pvt)	-	-	-	-	-	-	-	51	54	-3	-	-	-	-	234	234	4	0	49	49	49	0
11	Chhumey MSS	57	54	3	37	37	36	1	-	-	-	-	-	-	-	44	44	6	0	21	21	21	0
12	Darla MSS	131	130	1	177	177	177	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13	Gelephu MSS	139	132	7	132	132	118	14	106	105	1	-	-	-	-	-	-	-	-	-	-	-	-
14	Gomtu MSS	92	90	2	44	40	40	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	K/drapchu MSS	47	48	-1	40	39	39	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16	L/Zampa MSS	263	261	2	349	348	346	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17	Monggar MSS	-	-	-	-	-	-	-	262	262	0	165	165	163	2	-	-	-	-	-	-	-	-
18	Motithang MSS	104	104	0	92	92	92	0	225	221	4	179	179	179	0	-	-	-	-	-	-	-	-
19	Phuentsholing MSS	180	179	1	124	125	125	0	107	107	0	-	-	-	-	-	-	-	-	-	-	-	-
20	S/Jongkhar MSS	82	81	1	105	105	105	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21	Samtse MSS	133	131	2	82	82	82	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22	Sarpang MSS	81	81	0	57	56	56	0	153	153	0	115	115	107	8	-	-	-	-	-	-	-	-
23	Shaba MSS	-	-	-	-	-	-	-	82	82	0	29	29	29	0	-	-	-	-	-	-	-	-
24	T/Yangtse MSS	69	67	2	55	54	54	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25	Tangmachhu MSS	142	139	3	122	113	113	0	180	176	4	77	78	78	0	-	-	-	-	-	-	-	-
26	Trashigang MSS	164	163	1	200	181	181	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27	Tsenkharla MSS	116	112	4	136	136	134	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28	Wamrong MSS	250	240	10	205	199	199	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29	Wangchhu MSS	76	75	1	41	40	40	0	143	142	1	-	-	-	-	-	-	-	-	-	-	-	-
30	Yebilaptsa MSS	202	200	2	228	221	219	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31	Bidung LSS	55	55	0	82	82	82	0	264	262	14	174	172	160	11	0	6	14	0	4	9	5	5
32	Changangkha LSS	183	180	3	222	225	225	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33	Changzamtog LSS	147	145	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
34	Choden LSS	203	200	3	142	135	135	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
35	Dechheling LSS	57	57	0	39	39	39	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
36	Dewathang LSS	91	91	0	56	55	55	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
37	Dorokha LSS	76	75	1	39	39	39	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

38	Drametse LSS	193	185	8	133	130	117	13
39	Drugyelgang LSS	71	68	3	31	31	31	0
40	Gasa LSS	21	21	0	-	-	-	-
41	Gaselo LSS	45	45	0	-	-	-	-
42	Kanglung LSS	38	38	0	-	-	-	-
43	Karma LSS	14	14	0	5	5	5	0
44	Katsho LSS	66	66	0	-	-	-	-
45	Khaling LSS	66	66	0	39	38	38	0
46	Khuruthang LSS	232	227	5	234	224	200	24
47	Martshala LSS	95	93	2	65	62	62	0
48	Nobding LSS	65	65	0	-	-	-	-
49	Orong LSS	86	86	0	-	-	-	-
50	Panbang LSS	48	48	0	-	-	-	-
51	Radhi LSS	80	79	1	75	73	73	0
52	Samtengang LSS	52	52	0	108	106	106	0
53	Tsimalakha LSS	108	108	0	-	-	-	-
54	Ura LSS	33	32	1	35	34	34	0
55	W/Chhoeling LSS	104	104	0	56	56	56	0
56	Wangdue LSS	-	-	-	82	82	75	7
57	Woochu LSS	97	97	0	-	-	-	-
58	Yonphula LSS	52	51	1	43	43	43	0
59	Yurung LSS	44	44	0	-	-	-	-
	Total	559	551	79	371	363	357	65
		8	9		2	6	1	

MYE* - Mid-Year Exam

EYE* - End-of-Year Exam

TOT* - Total

TE* - Trial Exam

BEX* - Board Exam

2000

SI	School	Class 7			Class 8				Class 9			Class 10				Class 11			Class 12			
		MY E*	EY E*	Dif f.	TO T*	TE*	BE X*	Dif f.	MY E	EY E	Dif f.	TO T	TE*	BE X	Dif f.	MY E	EY E	Dif f.	TO T	TE	Be x	Dif f.
1	Damphu HSS	152	146	6	145	143	140	3	180	176	4	90	90	88	2	-	-	-	-	-	-	-

2	Drukgyel HSS	-	-	-	66	65	65	0	234	234	0	207	206	206	0	108	108	0	77	77	77	0
3	Gyelpozhing HSS	103	99	4	139	135	134	1	196	194	2	124	106	103	3	-	-	-	-	-	-	-
4	J/Sherubling HSS	-	-	-	-	-	-	-	325	324	1	294	282	276	6	89	88	0	76	76	76	0
5	Nangkor HSS	62	60	2	149	149	149	0	162	160	2	-	-	-	-	-	-	-	-	-	-	-
6	Punakha HSS	-	-	-	45	45	42	3	301	296	5	170	160	140	20	128	128	0	83	83	81	2
7	Rangjung HSS	42	42	0	34	34	34	0	148	148	0	-	-	-	-	-	-	-	-	-	-	-
8	Ugyen Dorji HSS	195	194	1	262	260	259	1	240	237	3	125	123	125	-2	-	-	-	-	-	-	-
9	Zhemgang HSS	43	43	0	44	42	40	2	259	258	1	217	216	213	3	-	-	-	-	-	-	-
10	Kelki HSS (Pvt)	-	-	-	-	-	-	-	-	-	-	47	47	47	0	365	365	0	19	19	19	-2
11	Darla MSS	94	91	3	73	73	67	6	-	-	-	-	-	-	-	690	690	0	42	42	42	0
12	Gedu MSS	90	90	0	84	84	83	1	118	118	0	-	-	-	-	-	-	-	-	-	-	-
13	Gelephu MSS	206	202	4	147	147	141	6	145	151	-6	105	105	95	10	-	-	-	-	-	-	-
14	Gomtu MSS	87	82	5	55	53	53	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	K/drapchu MSS	52	50	2	41	41	41	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16	L/Zampa MSS	245	244	1	272	271	271	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17	Monggar MSS	-	-	-	-	-	-	-	228	228	0	198	198	178	20	-	-	-	-	-	-	-
18	Motithang MSS	-	-	-	105	105	105	0	360	357	3	216	216	216	0	-	-	-	-	-	-	-
19	Phuentsholing MSS	81	81	0	166	166	166	0	128	124	4	82	82	82	0	-	-	-	-	-	-	-
20	S/Jongkhar MSS	99	97	2	62	61	61	0	67	67	0	-	-	-	-	-	-	-	-	-	-	-
21	Samtse MSS	108	106	2	101	99	99	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22	Sarpang MSS	-	-	-	91	91	85	6	178	178	0	129	129	115	14	-	-	-	-	-	-	-
23	Shaba MSS	-	-	-	-	-	-	-	95	93	2	63	60	59	1	-	-	-	-	-	-	-
24	T/Yangtse MSS	48	47	1	29	29	29	0	177	177	0	-	-	-	-	-	-	-	-	-	-	-
25	Tangmachhu MSS	144	144	0	128	125	122	3	169	161	8	102	102	100	2	-	-	-	-	-	-	-
26	Trashigang MSS	166	166	0	155	150	150	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27	Tsenkharla MSS	188	181	7	168	168	160	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28	Wamrong MSS	134	133	1	221	210	204	6	155	150	5	-	-	-	-	-	-	-	-	-	-	-
29	Wangchhu MSS	73	71	2	62	62	62	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-

30	Yebilaptsa MSS	190	186	4	223	221	212	9	-	-	-	-	-	-	-
31	Bidung LSS	69	69	0	50	49	49	0	386	383	34	216	212	204	79
32	Changgangkha LSS	180	179	1	173	170	170	0							
33	Changzamtog LSS	222	221	1	114	115	112	3							
34	Choden LSS	190	186	4	140	136	135	1							
35	Damphu LSS	87	87	0	-	-	-	-							
36	Dechheling LSS	70	70	0	64	53	53	0							
37	Dewathang LSS	62	61	1	58	58	47	11							
38	Dorokha LSS	75	69	6	52	51	45	6							
39	Drametse LSS	126	126	0	163	163	156	7							
40	Drugyelgang LSS	90	82	8	37	35	31	4							
41	Drukgyel LSS	50	49	1	-	-	-	-							
42	Gasa LSS	31	31	0	21	21	20	1							
43	Gaselo LSS	76	76	0	46	46	43	3							
44	Jigme Namgyel LSS	111	111	0	-	-	-	-							
45	Kanglung LSS	60	60	0	45	45	45	0							
46	Karma LSS	19	19	0	12	11	11	0							
47	Katsho LSS	60	58	2	49	48	48	0							
48	Khaling LSS	43	40	3	66	62	62	0							
49	Khuruthang LSS	307	305	2	220	212	198	14							
50	Lango LSS	72	72	0	-	-	-	-							
51	Langthel LSS	49	49	0	-	-	-	-							
52	Lhuentse LSS	71	71	0	-	-	-	-							
53	Lobesa LSS	48	48	0	-	-	-	-							
54	Martshala LSS	103	97	6	88	78	78	0							
55	Nobding LSS	65	65	0	53	53	50	3							
56	Orong LSS	47	47	0	62	62	62	0							
57	Panbang LSS	57	55	2	36	36	36	0							

MYE* - Mid-Year Exam
EYE* - End-of-Year Exam

TOT* - Total

TE* - Trial Exam

BEX* - Board Exam

58	Paro LSS	322	322	0	193	183	183	0
59	Radhi LSS	39	39	0	66	63	63	0
60	Samtengang LSS	72	72	0	58	55	55	0
61	Thungkhar LSS	73	73	0	-	-	-	-
62	Tshangkha LSS	40	40	0	-	-	-	-
63	Tsimalakha LSS	98	99	-1	119	116	108	8
64	Ura LSS	29	29	0	23	23	23	0
65	W/Chhoeling LSS	104	104	0	61	61	61	0
66	Wamrong LSS	72	72	0	-	-	-	-
67	Wangdue LSS	154	153	1	65	57	57	0
68	Woochu LSS	113	113	0	72	72	69	3
69	Yonphula LSS	44	44	0	54	54	54	0
70	Yurung LSS	65	65	0	34	34	34	0
	Total	626	618	85	536	525	513	11
		7	2		1	1	2	9

2001

Sl	School	Class 7			Class 8				Class 9			Class 10				Class 11			Class 12				
		MY E*	EY E*	Dif f.	TO T*	TE*	BE X*	Dif f.	MY E	EY E	Dif f.	TO T	TE*	BE X	Dif f.	MY E	EY E	Dif f.	TO T	TE	Be x	Dif f.	
1	Damphu HSS	90	88	2	146	144	142	2	172	164	8	134	131	117	14	-	-	-	-	-	-	-	
2	Drukgyel HSS	-	-		-	-	-	-	213	213	0	212	212	212	0	114	11	4	0	11	11	11	0
3	Gyelpozhing HSS	-	-		111	108	108	0	141	140	1	186	185	182	3	-	-	-	-	-	-	-	
4	J/Sherubling HSS	-	-		-	-	-	-	279	276	3	259	257	251	6	105	10	4	1	88	88	88	0
5	Nangkor HSS	54	54	0	54	54	54	0	205	205	0	122	122	122	0	-	-	-	-	-	-	-	
6	Punakha HSS	-	-		-	-	-	-	302	285	17	233	220	220	0	123	11	9	4	12	12	12	1
7	Rangjung HSS	25	25	0	45	45	45	0	160	160	0	128	124	124	0	-	-	-	-	-	-	-	
8	Ugyen Dorji HSS	169	166	3	190	188	188	0	266	263	3	213	213	213	0	-	-	-	-	-	-	-	
9	Zhemgang HSS	40	38	2	42	42	42	0	115	115	0	211	211	204	7	-	-	-	-	-	-	-	
10	Kelki HSS (Pvt)	-	-		-	-	-	-	-	-	-	30	30	30	0	258	25	8	0	37	37	37	0
																			3	0	0	0	0

11	Nima HSS (Pvt)	-	-		-	-	-	-	-	-	-	59	53	54	-1	341	33						
12	Chhumei MSS	79	77	2	50	48	46	2	79	75	4	-	-	-	-	94	93	3	-	-	-	-	-
13	Darla MSS	100	90	10	80	78	78	0	-	-	-	-	-	-	-								
14	Gedu MSS	96	96	0	89	88	90	-2	107	101	6	114	112	108	4								
15	Gelephu MSS	159	159	0	186	186	174	12	135	130	5	107	107	95	12								
16	Gomtu MSS	89	86	3	60	60	60	0	-	-	-	-	-	-									
17	K/drapchu MSS	76	77	-1	47	46	46	0	-	-	-	-	-	-									
18	L/Zampa MSS	218	216	2	250	248	248	0	113	110	3	-	-	-									
19	Monggar MSS	-	-		-	-	-	-	253	253	0	162	162	149	13								
20	Motithang MSS	-	-		-	-	-	-	322	315	7	299	299	299	0								
21	Phuentsholing MSS	45	46	-1	77	75	75	0	169	166	3	100	100	100	0								
22	S/Jongkhar MSS	88	87	1	62	62	60	2	60	60	0	37	37	37	0								
23	Samtse MSS	116	114	2	108	101	98	3	105	106	-1	-	-	-									
24	Sarpang MSS	109	109	0	99	99	91	8	217	217	0	160	160	154	6								
25	Shaba MSS	-	-		-	-	-	-	169	168	1	80	76	75	1								
26	T/Yangtse MSS	62	62	0	49	48	48	0	151	150	1	160	158	151	7								
27	Tangmachhu MSS	112	107	5	143	137	135	2	139	134	5	141	139	137	2								
28	Trashigang MSS	192	192	0	-	-	-	-	-	-	-	-	-	-									
29	Tsenkharla MSS	122	121	1	196	187	180	7	-	-	-	-	-	-									
30	Wamrong MSS	89	85	4	128	124	124	0	60	60	0	110	110	110	0								
31	Wangchhu MSS	70	70	0	53	52	52	0	-	-	-	-	-	-									
32	Yebilaptsa MSS	229	220	9	193	184	184	0	-	-	-	-	-	-									
33	Bidung LSS	86	86	0	69	68	67	1	393	386	66	326	321	314	74								
34	Changgangkha LSS	213	213	0	160	158	158	0															
35	Changzamtog LSS	210	209	1	164	160	160	0															
36	Choden LSS	242	239	3	131	124	124	0															
37	Damphu LSS	87	87	0	-	-	-	-															
38	Dechheling LSS	42	42	0	53	63	61	2															
39	Dewathang LSS	59	57	2	49	49	49	0															
40	Dorokha LSS	75	75	0	53	51	51	0															
41	Drametse LSS	112	111	1	120	120	115	5															

MYE* - Mid-Year Exam
 EYE* - End-of-Year Exam
 TOT* - Total
 TE* - Trial Exam
 BEX* - Board Exam

42	Drugyelgang LSS	80	74	6	61	58	56	2
43	Drukgyel LSS	68	61	7	30	30	30	0
44	Gasa LSS	38	28	10	30	28	28	0
45	Gaselo LSS	93	93	0	76	74	74	0
46	Gonpa Singma LSS	34	32	2	-	-	-	-
47	Jigme Namgyel LSS	101	101	0	115	112	112	0
48	Kanglung LSS	59	58	1	54	54	53	1
49	Karma LSS	18	20	-2	12	12	12	0
50	Katsho LSS	85	83	2	57	56	57	-1
51	Khaling LSS	47	47	0	46	46	46	0
52	Kheni LSS	36	35	1	-	-	-	-
53	Khoma LSS	52	52	0	-	-	-	-
54	Khuruthang LSS	278	276	2	302	295	283	12
55	Kurichhu LSS	128	125	3	-	-	-	-
56	Lango LSS	54	53	1	66	66	63	3
57	Langthel LSS	62	60	2	36	35	35	0
58	Lhuentse LSS	55	55	0	72	70	70	0
59	Lobesa LSS	85	84	1	48	48	45	3
60	Martshala LSS	125	113	12	94	89	89	0
61	Nobding LSS	56	51	5	50	47	45	2
62	Norbuling LSS	96	97	-1	-	-	-	-
63	Orong LSS	75	75	0	41	39	39	0
64	Panbang LSS	69	67	2	43	41	41	0
65	Paro LSS	219	219	0	271	264	263	1
66	Radhi LSS	36	36	0	39	38	38	0
67	Samtengang LSS	82	81	1	65	63	61	2
68	Thungkhar LSS	75	75	0	79	78	78	0
69	Tsebar LSS	38	38	0	-	-	-	-
70	Tshangkha LSS	78	77	1	36	36	36	0
71	Tsimalakha LSS	117	115	2	92	88	86	2
72	Ura LSS	60	59	1	29	27	27	0
73	W/Chhoeling LSS	112	112	0	24	24	24	0

74	Wamrong LSS	68	68	0	59	55	55	0
75	Wangdue LSS	163	158	5	111	110	110	0
76	Woochu LSS	91	91	0	80	80	78	2
77	Yonphula LSS	55	55	0	45	44	43	1
78	Yurung LSS	75	75	0	50	49	49	0
	Total	662	651	11	493	481	474	72
		8	2	6	2	6	4	

MYE* - Mid-Year Exam
 EYE* - End-of-Year Exam
 TOT* - Total
 TE* - Trial Exam
 BEX* - Board Exam

COMPARATIVE STUDIES - Examinations - 1999

Sl.	School	Class 7 (Home Exam)				Class 8 (Trial)				Class 8 (LSSCE)				Class 9 (Home Exam)				Class 10 (ICSE)				Class
		Total	Pass	Fail	Pass %	Total	Pass	Fail	Pass %	Total	Pass	Fail	Pass %	Total	Pass	Fail	Pass %	Total	Pass	Fail	Pass %	
1	Damphu HSS	114	110	4	96.5%	73	69	4	94.5%	69	63	6	91.3%	103	83	20	80.58%	120	83	37	69.16%	-
2	Drukgyel HSS	84	50	34	59.52%	65	31	34	47.7%	-	-	-	-	193	170	23	88%	170	133	7	78.23%	69
3	Gyelpzhing HSS	136	113	23	83.08%	data not available				156	134	22	85.9%	130	121	9	93.07%	34	25	9	73.5%	-
4	J/Sherubling HSS	-	-	-	-	-	-	-	-	-	-	-	-	299	203	96	67.89%	240	232	9	96.7%	76
5	Nangkor HSS	159	141	18	88.67%	140	97	43	69.3%	140	132	8	94.3%	-	-	-	-	-	-	-	-	-
6	Punakha HSS	45	29	16	64.44%	40	39	12	97.5%	36	36	0	100%	226	141	85	62.39%	193	131	62	67.8%	67
7	Rangjung HSS	37	33	4	89%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Ugyen Dorji HSS	220	187	33	85%	258	126	132	79.7%	242	173	69	71.4%	134	121	13	90.29%	126	86	39	68.2%	-
9	Zhemgang HSS	45	43	2	95.5%	42	39	3	92.8%	39	33	6	84.6%	239	217	22	90.7%	170	166	4	97.6%	-
10	Kelki High School	-	-	-	-	-	-	-	-	-	-	-	-	55	34	21	62%	-	-	-	-	234
11	Chhumey MSS	54	29	25	53.7%	-	-	-	-	36	34	2	94.4%	-	-	-	-	-	-	-	-	446
12	Darla MSS	130	91	39	70%	177	100	77	56%	177	120	57	67.7%	-	-	-	-	-	-	-	-	-
13	Gelephu MSS	132	111	21	84.09%	132	118	14	89.4%	118	99	19	83.8%	105	93	12	88.57%	-	-	-	-	-
14	Gomtu MSS	90	58	32	64.44%	40	32	8	80%	40	34	6	85%	-	-	-	-	-	-	-	-	-
15	K/drapchu MSS	48	32	16	66.67%	39	39	0	100%	39	30	9	76.9%	-	-	-	-	-	-	-	-	-
16	L/Zampa MSS	261	233	28	89.27%	348	348	0	100%	346	291	55	84.1%	-	-	-	-	-	-	-	-	-
17	Monggar MSS	-	-	-	-	-	-	-	-	-	-	-	-	262	173	89	66.03%	163	144	19	88.3%	-

18	Motithang MSS	104	94	10	90%	92	57	35	61.9%	92	78	14	84.7%	221	208	13	94.1%	179	148	31	82.6%		
19	Phuntshoing MSS	178	136	42	76.4%	125	110	15	92%	125	112	13	89.6%	107	74	33	69.15%	-	-	-	-		
20	S/Jongkhar MSS	81	47	34	58%	105	73	32	69.5%	105	78	27	74.2%	-	-	-	-	-	-	-	-		
21	Samtse MSS	131	94	37	71.75%	82	79	3	96.3%	131	94	37	71.7%	-	-	-	-	-	-	-	-		
22	Sarpang MSS	81	67	14	82.71%	data not available				55	49	6	89%	153	129	24	84.31%	107	96	11	89.7%		
23	Shaba MSS	-	-	-	-	-	-	-	-	-	-	-	-	82	62	20	75.60%	29	23	6	79.3%		
24	T/Yangtse MSS	67	38	29	56.71%	54	26	28	48%	53	45	8	84.9%	-	-	-	-	-	-	-	-		
25	Tangmachhu MSS	139	125	14	89.92%	113	113	0	100%	113	107	6	94.6%	176	113	63	64.20%	78	76	2	97.4%		
26	Trashigang MSS	164	123	41	75%	data not available				181	145	36	80.1%	2485	1942	543	78.14%	1609	1373	236	85.3%		
27	Tsenkharla MSS	187	145	42	77.54%	-	-	-	-	135	124	11	91.8%	cont'd									
28	Wamrong MSS	240	209	31	87.08%	199	199	0	100%	199	187	12	93.9%	Sl.	School	Class 7 (Home Exam)					C		
29	Wangchhu MSS	75	66	9	88%	40	33	7	82.5%	40	38	2	95%	44	Khuruthang LSS	227	175	52	77.09%	224			
30	Bidung LSS	55	40	15	72.72%	82	82	0	100%	82	62	20	75.6%	45	Martshala LSS	93	87	6	93.54%		da		
31	Changangkha LSS	180	152	28	84.44%	225	66	159	29.3%	225	198	27	88%	46	Nobding LSS	65	54	11	83.07%	-			
32	Changzamtog LSS	145	103	42	71.03%	-	-	-	-	-	-	-	-	47	Orong LSS	86	64	22	74.41%	-			
33	Choden LSS	200	148	52	74%	135	135	0	100%	135	129	6	95.5%	48	Panbang LSS	48	34	14	70.83%	-			
34	Dechheling LSS	57	57	0	100%	39	39	0	100%	39	35	4	89.7%	49	Radhi LSS	79	73	6	92.4%	73			
35	Dewathang LSS	91	68	23	74.72%	data not available				55	46	9	83.6%	50	Samtegang LSS	52	38	14	73.07%	106			
36	Dorokha LSS	75	52	23	69.33%	39	2	35	5.12%	39	36	3	92.3%	51	Tsimalakha LSS	108	108	0	100%	-			
37	Drametse LSS	185	157	28	84.86%	117	113	4	96.5%	117	113	4	96.5%	52	Ura LSS	-	-	-	-	34			
38	Drujegang LSS	68	34	34	50%	31	31	0	100%	31	30	1	96.7%	53	W/Chholing LSS	104	68	36	65.38%	56			
39	Gaselo LSS	45	34	11	75.55%	-	-	-	-	-	-	-	-	54	Wangdue LSS	-	-	-	-	82			
40	Kanglung LSS	38	38	0	100%	-	-	-	-	-	-	-	-	55	Woochu LSS	97	57	40	58.76%	-			
41	Karma LSS	14	11	3	78.54%	5	2	3	40%	-	-	-	-	56	Yonphula LSS	51	49	2	96%	43			
42	Katsho LSS	66	54	12	81.81%	-	-	-	-	-	-	-	-	57	Yurung LSS	44	33	11	75%	-			
43	Khaling LSS	66	61	5	92.42%	37	35	2	94.6%	37	33	4	89%					5341	4253	1088	79.63%	3492	2

COMPARATIVE STUDIES - Examinations - 2000

Sl.	School	Class 7 (Home Exam)				Class 8 (Trial)				LSSC Examination				Class 9 (Home Exam)				ICSE Examination				Class	
		Total	Pass	Fail	Pass %	Total	Pass	Fail	Pass %	Total	Pass	Fail	Pass %	Total	Pass	Fail	Pass %	Total	Pass	Fail	Pass %	Total	Pass
1	Damphu HSS	146	122	24	83.5%	143	140	3	97.9%	140	128	12	91.4%	176	148	28	84.09%	88	58	30	65.9%	-	-
2	Drukgyel HSS	-	-	-	-	65	29	36	44.6%	data not available				234	208	26	89%	206	144	56	69.9%	108	-
3	Gyelpzhing HSS	99	99	0	100%	data not available				134	110	24	82%	194	174	20	89.69%	103	73	30	70.8%	-	-
4	J/Sherubling HSS	-	-	-	-	-	-	-	-	-	-	-	-	324	250	74	77.16%	276	251	28	90.9%	88	-
5	Nangkor HSS	60	45	15	75%	149	140	9	93.9%	149	122	27	81.8%	160	113	47	70.62%	-	-	-	-	-	-
6	Punakha HSS	-	-	-	-	43	43	0	100%	42	40	2	95.2%	291	207	84	71.13%	140	124	16	88.6%	128	-
7	Rangjung HSS	40	40	0	100%	34	33	1	99%	34	27	7	79%	148	130	18	87.83%	-	-	-	-	-	-
8	Ugyen Dorji HSS	194	165	29	85.05%	260	120	140	46.1%	259	228	31	88%	237	212	25	89.45%	125	75	48	60%	-	-
9	Zhemgang HSS	43	40	3	93%	42	40	2	95.2%	40	37	3	92.5%	258	226	32	97.5%	213	194	19	91%	-	-
10	Kelki High School	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	47	24	23	51%	365	-
11	Chhumey MSS	40	35	5	85%	-	-	-	-	29	27	2	93%	-	-	-	-	-	-	-	-	-	689
12	Darla MSS	91	50	41	54.94%	73	60	13	82%	67	47	20	70.1%	-	-	-	-	-	-	-	-	-	-
13	Gedu MSS	-	-	-	-	84	66	18	78.5%	83	55	28	66.2%	-	-	-	-	-	-	-	-	-	-
14	Gelephu MSS	202	178	24	88.11%	141	141	6	100%	141	130	11	92.1%	151	132	19	87.41%	-	-	-	-	-	-
15	Gomtu MSS	82	54	28	65.85%	53	45	8	85%	53	53	0	100%	-	-	-	-	-	-	-	-	-	-
16	K/drapchu MSS	50	40	10	80%	41	38	3	92.6%	41	27	14	65.8%	-	-	-	-	-	-	-	-	-	-
17	L/Zampa MSS	244	216	28	88.52%	271	271	0	100%	271	224	47	82.6%	-	-	-	-	-	-	-	-	-	-
18	Monggar MSS	-	-	-	-	-	-	-	-	-	-	-	-	228	142	86	62.2%	178	146	32	82%	-	-
19	Motithang MSS	-	-	-	-	105	100	5	95.2%	105	77	28	73.3%	357	304	53	85.6%	216	122	94	56.5%	-	-
20	Phuntshoing MSS	81	54	27	66.67%	166	148	18	89.1%	166	152	14	91.5%	124	92	32	74.19%	82	65	17	79.2%	-	-
21	S/Jongkhar	97	59	38	60.82%	61	41	20	67.2%	61	41	20	67.2%	67	40	27	59.7%	-	-	-	-	-	-

COMPARATIVE STUDIES - Examinations - 2001

Sl.	School	Class 7 (Home Exam)				Class 8 (Trial)				LSSC Examination				Class 9 (Home Exam)				ICSE Examination				Class
		Total	Pass	Fail	Pass %	Total	Pass	Fail	Pass %	Total	Pass	Fail	Pass%	Total	Pass	Fail	Pass %	Total	Pass	Fail	Pass %	
1	Damphu HSS	88	78	10	88.6%	144	142	2	98.6%	142	131	11	92.2%	164	150	14	91.5%	117	115	2	98.3%	-
2	Drukgyel HSS	-	-	-	-	-	-	-	-	-	-	-	-	213	183	30	85.1%	212	203	7	95.7%	114
3	Gyelpzhing HSS	-	-	-	-	data not available				108	87	21	80.5%	140	117	23	83.57%	182	166	16	91.2%	-
4	J/Sherubling HSS	-	-	-	-	-	-	-	-	-	-	-	-	276	241	35	87.31%	251	250	1	99.6%	104
5	Nangkor HSS	54	48	6	88.88%	54	48	6	88.8%	54	48	6	88.8%	205	179	26	87.31%	122	109	2	89.3%	-
6	Punakha HSS	-	-	-	-	-	-	-	-	-	-	-	-	285	218	67	76.49%	220	198	22	90%	119
7	Rangjung HSS	39	32	7	86.48%	45	44	1	99%	45	34	11	75.5%	160	103	57	64%	124	114	10	91.9%	-
8	Ugyen Dorji HSS	166	127	39	76.50%	188	107	81	56.9%	188	172	16	91.4%	263	210	53	79.84%	213	199	14	93.4%	-
9	Zhemgang HSS	38	30	8	78.9%	42	42	0	100%	42	38	4	90.4%	115	113	2	98%	204	201	3	98.5%	-
10	Kelki HSS (Pvt)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	28	2	93.3%	258
11	Nima HSS (Pvt)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	54	54	0	100%	338
12	Chhumey MSS	77	71	6	92.2%	-	-	-	-	46	42	4	91%	79	52	27	65.82%	-	-	-	-	933
13	Darla MSS	99	60	39	60.6%	78	65	13	83%	65	58	7	89.2%	-	-	-	-	-	-	-	-	-
14	Gedu MSS	96	76	20	79.16%	89	67	22	75.3%	-	-	-	-	101	71	30	70.29%	-	-	-	-	-
15	Gelephu MSS	159	132	27	83.01%	174	134	40	77%	174	134	40	77%	130	104	26	80%	-	-	-	-	-
16	Gomtu MSS	86	53	23	61.62%	60	50	10	83%	60	60	0	100%	-	-	-	-	-	-	-	-	-
17	K/drapchu MSS	77	76	01	98.70%	46	29	17	63%	46	46	0	100%	-	-	-	-	-	-	-	-	-
18	L/Zampa MSS	216	188	28	87.03%	248	248	0	100%	248	224	24	90.3%	110	95	15	86.36%	-	-	-	-	-
19	Monggar MSS	-	-	-	-	-	-	-	-	-	-	-	-	253	171	82	67.58%	149	149	0	100%	-
20	Motithang MSS	-	-	-	-	-	-	-	-	-	-	-	-	315	287	28	91.11%	299	279	20	93.3%	-
21	Phuntshoing MSS	46	39	7	84.78%	75	70	5	93%	75	73	2	97.3%	166	124	42	74.69%	100	99	1	99%	-
22	S/Jongkhar MSS	87	56	31	64.36%	62	45	17	72.5%	60	52	8	86.6%	60	29	31	48.33%	37	35	2	94.6%	-
23	Samtse MSS	113	89	24	78.76%	98	85	13	86.7%	113	89	24	78.7%	106	72	34	67.92%	-	-	-	-	-
24	Sarpang MSS	109	99	10	90.82%	data not available				91	82	9	90%	217	183	34	84.33%	154	154	0	100%	-
25	Shaba MSS	-	-	-	-	-	-	-	-	-	-	-	-	168	144	24	85.71%	75	74	1	98.6%	-

26	T/Yangtse MSS	62	56	6	90.32%	48	41	7	85.4%	48	47	1	97.9%	144	139	5	96.52%	151	144	7	95.3%
27	Tangmachhu MSS	107	98	9	91.58%	137	135	2	98.5%	135	123	12	91.1%	139	109	30	78.41%	137	137	0	100%
28	Trashigang MSS	193	154	39	79.79%	147	125	22	85.3%	data not available				-	-	-	-	-	-	-	-
29	Tsenkharla MSS	155	138	17	89.03%	188	182	6	96.8%	180	172	8	95.5%	-	-	-	-	-	-	-	-
30	Wamrong MSS	85	68	17	80%	124	124	0	100%	124	122	2	98.4%	150	135	15	90%	110	102	8	92.7%
31	Wangchhu MSS	70	51	19	72.85%	data not available				52	44	8	84.6%	60	40	20	66.67%	-	-	-	-
32	Yebilaptsa MSS	220	134	86	60.9%	-	-	-	-	-	-	-	-	4019	3269	750	81.3%	2941	2823	118	95.9%
33	Bidung LSS	86	72	14	83.72%	67	67	0	100%	67	59	8	88%								
34	Changgangkha LSS	213	185	28	86.85%	158	76	82	48.1%	158	153	5	96.8%								
35	Changzamtog LSS	209	160	49	76.55%	160	160	0	100%	160	153	7	95.6%	Sl.	School	Class 7 (Home Exam)				C	
36	Choden LSS	239	195	44	81.58%	124	124	0	100%	124	122	2	98.3%	57	Langthel LSS	60	49	11	82%	35	
37	Damphu LSS	87	66	21	75.8%	-	-	-	-	-	-	-	-	58	Lobesa LSS	78	72	6	92.30%	48	
38	Dechheling LSS	42	40	2	95.23%	63	29	34	46%	61	50	11	81.9%	59	Martshala LSS	113	95	18	84.07%	89	
39	Dewathang LSS	58	42	16	72.41%	data not available				49	36	13	73.4%	60	Nobding LSS	51	33	18	64.70%	45	
40	Dorokha LSS	75	49	26	65.33%	51	26	25	50.9%	51	44	7	86.2%	61	Orong LSS	75	58	17	77.33%	39	
41	Drametse LSS	111	95	16	85.58%	120	115	5	95.8%	data not available				62	Panbang LSS	69	58	10	84.05%	41	
42	Drujegang LSS	74	48	26	64.86%	58	56	2	96.5%	56	53	3	94.6%	63	Paro LSS	219	152	67	69.4%	264	
43	Drukgyel LSS	61	46	15	75.4%	30	17	13	56.6%	30	29	1	96.6%	64	Radhi LSS	36	29	7	80.55%	37	
44	Gasa LSS	28	26	2	92.85%	28	26	2	92.8%	28	26	2	92.8%	65	Samtegang LSS	81	68	13	83.95%	63	
45	Gaselo LSS	93	74	19	79.56%	74	74	0	100%	74	70	4	94.6%	66	Thungkhar LSS	75	75	0	100%	da	
46	Gonpa Singma LSS	32	30	2	93.8%	-	-	-	-	-	-	-	-	67	Tsebar LSS	38	29	9	76%	-	
47	J/ Namgyel LSS	101	75	26	76%	data not available				112	88	24	78.5%	68	Tshangkha LSS	78	69	8	88.46%	36	
48	Kanglung LSS	58	51	7	87.93%	53	53	0	100%	53	41	12	77.3%	69	Tsimalakha LSS	115	103	12	89.56%	88	
49	Karma LSS	20	17	3	85%	12	8	4	66.7%	-	-	-	-	70	Ura LSS	59	42	17	71%	27	
50	Katsho LSS	83	62	21	74.69%	56	32	24	57.1%	57	49	8	85.9%	71	W/Chholing LSS	112	70	42	62.5%	24	
51	Khaling LSS	46	44	2	96%	46	46	0	100%	46	40	6	86.9%	72	Wamrong LSS	68	60	8	88.23%	55	
52	Kheni LSS	35	31	4	88.57%	-	-	-	-	-	-	-	-	73	Wangdue LSS	156	117	39	75%	da	
53	Khoma LSS	52	30	22	57.69%	-	-	-	-	-	-	-	-	74	Woochu LSS	91	77	14	84.61%	80	
54	Khuruthang LSS	276	237	39	85.86%	295	144	151	48.8%	283	237	46	83.7%	75	Yonphula LSS	53	45	8	84.9%	44	
55	Kurichhu LSS	125	119	6	95.2%	-	-	-	-	-	-	-	-	76	Yurung LSS	75	58	17	77.33%	49	

ANNEXURE 'C' (Page 135 of 162)
COMPARATIVE STUDY - FACTORS AFFECTING PERFORMANCE - Teacher-Pupil Ratio

Year	School	T-P Ratio	School	T-P Ratio	School	T-P Ratio	School	T-P Ratio	School	T-P Ratio	School	T-P Ratio	School	T-P Ratio
1999	Damphu HSS	1:27	Chhumey MSS	1:34	Samtse MSS	1:33.2	Bidung LSS	1:34	Drukgyel LSS	1:41	K/ thang LSS	1:31	Samtengang LSS	1:48
2000		1:33		1:28		1:32.1		1:32		1:31		1:36		1:44
2001		1:29		1:34		1:31.3		1:25		1:33		1:35		1:46
1999	Drukgyel HSS	1:21	Darla MSS	1:49	Sarpang MSS	1:20	C/kha LSS	1:33.6	Gasa LSS	1:21	Lango LSS	1:38	Tsebar LSS	1:54
2000		1:23		1:40		1:21		1:33.6		1:27		1:39		1:58
2001		1:21		1:54		1:26		1:29.7		1:23		1:37		1:38.5
1999	Gyelpozhing HSS	1:27	Gelephu MSS	1:52	Shaba MSS	1:42	C/zamtog LSS	1:48	G Singma LSS	-	Langthel LSS	1:59	Tshangkha LSS	1:22
2000		1:35.5		1:34		1:43		1:36		-		1:53		1:31
2001		1:27.2		1:26		1:46		1:41		1:41		1:53		1:31
1999	J/Sherubling HSS	1:22	Gomtu MSS	1:44	T/Yangtse MSS	1:38	Choden LSS	1:28	J Namgyel LSS	1:33	Lhuentse LSS	-	Tsimalakha LSS	1:50
2000		1:28		1:39		1:37		1:22		1:33		1:53		1:37
2001		1:28		1:35		1:34		1:27		1:33		1:45		1:31
1999	Nangkor HSS	1:34.7	K/drapchu MSS	1:34	Tangmachhu MSS	1:29	Damphu LSS	-	Kanglung LSS	1:37.3	Lobesa LSS	1:53.7	Ura LSS	1:59.8
2000		1:25		1:31		1:29		-		1:35.4		1:62		1:53.8
2001		1:30		1:31		1:28		1:44		1:35.1		1:37		1:46
1999	Punakha HSS	1:19	L/Zampa MSS	1:25	Trashigang MSS	-	Dechheling LSS	1:60	Karma LSS	1:22	Martshala LSS	1:27	Wamrong LSS	1:32.2
2000		1:26		1:19		1:34		1:47		1:21		1:32		1:53.9
2001		1:27		1:18		1:34		1:49		1:16		1:37		1:56.

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1999	Ugyen Dorji HSS	1:32.2	Monggar MSS	1:22	Tsenkharla MSS	1:36	Dewathang LSS	1:35	Katsho LSS	1:34	Orong LSS	1:36	Woochu LSS	1:53
2000		1:30		1:23		1:45		1:30		1:36		1:39		1:49
2001		1:32		1:22		1:48		1:26		1:35		1:40		1:34
1999	Zhemgang HSS	1:19	Motithang MSS	1:18	Wamrong MSS	1:41	Dorokha LSS	1:64	Khaling LSS	1:33	Panbang LSS	1:43.9	Yonphula LSS	1:57
2000		1:21		1:19		1:33		1:47		1:26		1:43		1:51
2001		1:20		1:17		1:28		1:55		1:27		1:40.8		1:52
1999	Kelki H School	1:22.6	P/ling MSS	1:27	Wangchhu MSS	1:40	Drametse LSS	1:44	Kheni LSS	1:74	Paro LSS	-	Yurung LSS	1:59.8
2000		1:22.7		1:27		1:39		1:44		1:42		1:23.9		1:53.8
2001		1:23.5		1:23		1:28		1:38		1:38		1:23.8		1:46
1999	Nima H School	-	S/Jongkhar MSS	1:37	Yebilaptsa MSS	1:50	Drujegang LSS	1:45	Khoma LSS	1:26	Radhi LSS	1:31		
2000		-		1:33		1:38		1:49		1:26		1:23		
2001		1:18		1:31		1:39		1:36		1:36		1:28		

COMPARATIVE STUDY - FACTORS AFFECTING PERFORMANCE - Teacher-Pupil Ratio

1999

School	T-P Ratio	School	T-P Ratio	School	T-P Ratio	School	T-P Ratio	School	T-P Ratio	School	T-P Ratio	School	T-P Ratio
Damphu HSS	1:27	Chhumei MSS	1:34	Samtse MSS	1:33.2	Bidung LSS	1:34	Drukgyel LSS	1:41	K/ thang LSS	1:31	Samtengang LSS	1:48
Drukgyel HSS	1:21	Darla MSS	1:49	Sarpang MSS	1:20	C/kha LSS	1:33.6	Gasa LSS	1:21	Lango LSS	1:38	Tsebar LSS	1:54
Gyelpozhing HSS	1:27	Gelephu MSS	1:52	Shaba MSS	1:42	C/zamtog LSS	1:48	G Singma LSS	-	Langthel LSS	1:59	Tshangkha LSS	1:22
J/Sherubling HSS	1:22	Gomtu MSS	1:44	T/Yangtse MSS	1:38	Choden LSS	1:28	J Namgyel LSS	1:33	Lhuentse LSS	-	Tsimalakha LSS	1:50
Nangkor HSS	1:34.7	K/drapchu MSS	1:34	Tangmachhu MSS	1:29	Damphu LSS	-	Kanglung LSS	1:37.3	Lobesa LSS	1:53.7	Ura LSS	1:59.8
Punakha HSS	1:19	L/Zampa MSS	1:25	Trashigang MSS	-	Dechheling LSS	1:60	Karma LSS	1:22	Martshala LSS	1:27	Wamrong LSS	1:32.2
Ugyen Dorji HSS	1:32.2	Monggar MSS	1:22	Tsenkharla MSS	1:36	Dewathang LSS	1:35	Katsho LSS	1:34	Orong LSS	1:36	Woochu LSS	1:53
Zhemgang HSS	1:19	Motithang MSS	1:18	Wamrong MSS	1:41	Dorokha LSS	1:64	Khaling LSS	1:33	Panbang LSS	1:43.9	Yonphula LSS	1:57
Kelki H School	1:22.6	P/ling MSS	1:27	Wangchhu MSS	1:40	Drametse LSS	1:44	Kheni LSS	1:74	Paro LSS	-	Yurung LSS	1:59.8
Nima H School	-	S/Jongkhar MSS	1:37	Yebilaptsa MSS	1:50	Drujegang LSS	1:45	Khoma LSS	1:26	Radhi LSS	1:31		

2000

School	T-P Ratio	School	T-P Ratio	School	T-P Ratio	School	T-P Ratio	School	T-P Ratio	School	T-P Ratio	School	T-P Ratio
Damphu HSS	1:33	Chhumei MSS	1:28	Samtse MSS	1:32.1	Bidung LSS	1:32	Drukgyel LSS	1:31	K/ thang LSS	1:36	Samtengang LSS	1:44
Drukgyel HSS	1:23	Darla MSS	1:40	Sarpang MSS	1:21	C/kha LSS	1:33.6	Gasa LSS	1:27	Lango LSS	1:39	Tsebar LSS	1:58
Gyelpozhing HSS	1:35.5	Gelephu MSS	1:34	Shaba MSS	1:43	C/zamtog LSS	1:36	G Singma LSS	1:41	Langthel LSS	1:53	Tshangkha LSS	1:31
J/Sherubling HSS	1:28	Gomtu MSS	1:39	T/Yangtse MSS	1:37	Choden LSS	1:22	J Namgyel LSS	1:33	Lhuentse LSS	1:53	Tsimalakha LSS	1:37
Nangkor HSS	1:25	K/drapchu MSS	1:31	Tangmachhu MSS	1:29	Damphu LSS	-	Kanglung LSS	1:35.4	Lobesa LSS	1:62	Ura LSS	1:53.8
Punakha HSS	1:26	L/Zampa MSS	1:19	Trashigang MSS	1:34	Dechheling LSS	1:47	Karma LSS	1:21	Martshala LSS	1:32	Wamrong LSS	1:53.9
Ugyen Dorji HSS	1:30	Monggar MSS	1:23	Tsenkharla MSS	1:45	Dewathang LSS	1:30	Katsho LSS	1:36	Orong LSS	1:39	Woochu LSS	1:49
Zhemgang HSS	1:21	Motithang MSS	1:19	Wamrong MSS	1:33	Dorokha LSS	1:47	Khaling LSS	1:26	Panbang LSS	1:43	Yonphula LSS	1:51
Kelki H School	1:22.7	P/ling MSS	1:27	Wangchhu	1:39	Drametse LSS	1:44	Kheni LSS	1:42	Paro LSS	1:23.9	Yurung LSS	1:53.8

				MSS								
Nima H School	-	S/Jongkhar MSS	1:33	Yebilaptsa MSS	1:38	Drujegang LSS	1:49	Khoma LSS	1:26	Radhi LSS	1:23	

2001

School	T-P Ratio	School	T-P Ratio	School	T-P Ratio	School	T-P Ratio	School	T-P Ratio	School	T-P Ratio	School	T-P Ratio
Damphu HSS	1:29	Chhumey MSS	1:34	Samtse MSS	1:31.3	Bidung LSS	1:25	Drukgyel LSS	1:33	K/ thang LSS	1:35	Samtengang LSS	1:46
Drukgyel HSS	1:21	Darla MSS	1:54	Sarpang MSS	1:26	C/kha LSS	1:29.7	Gasa LSS	1:23	Lango LSS	1:37	Tsebar LSS	1:38.5
Gyelpozhing HSS	1:27.2	Gelephu MSS	1:26	Shaba MSS	1:46	C/zamtog LSS	1:41	G Singma LSS	1:41	Langthel LSS	1:53	Tshangkha LSS	1:31
J/Sherubling HSS	1:28	Gomtu MSS	1:35	T/Yangtse MSS	1:34	Choden LSS	1:27	J Namgyel LSS	1:33	Lhuentse LSS	1:45	Tsimalakha LSS	1:31
Nangkor HSS	1:30	K/drapchu MSS	1:31	Tangmachhu MSS	1:28	Damphu LSS	1:44	Kanglung LSS	1:35.1	Lobesa LSS	1:37	Ura LSS	1:46
Punakha HSS	1:27	L/Zampa MSS	1:18	Trashigang MSS	1:34	Dechheling LSS	1:49	Karma LSS	1:16	Martshala LSS	1:37	Wamrong LSS	1:56.6
Ugyen Dorji HSS	1:32	Monggar MSS	1:22	Tsenkharla MSS	1:48	Dewathang LSS	1:26	Katsho LSS	1:35	Orong LSS	1:40	Woochu LSS	1:34
Zhemgang HSS	1:20	Motithang MSS	1:17	Wamrong MSS	1:28	Dorokha LSS	1:55	Khaling LSS	1:27	Panbang LSS	1:40.8	Yonphula LSS	1:52
Kelki H School	1:23.5	P/ling MSS	1:23	Wangchhu MSS	1:28	Drametse LSS	1:38	Kheni LSS	1:38	Paro LSS	1:23.8	Yurung LSS	1:46
Nima H School	1:18	S/Jongkhar MSS	1:31	Yebilaptsa MSS	1:39	Drujegang LSS	1:36	Khoma LSS	1:36	Radhi LSS	1:28		

Examinations against Teacher-Pupil Ratio - 1999

SI .	School	TPRatio	7	LSSC E	9	ICSE	11	12
			Pass %	Pass %	Pass %	Pass %	Pass %	Pass %
1	Damphu HSS	1:27	96.5%	91.3 %	80.58 %	69.16 %	na	na
2	Drukgyel HSS	1:21	59.50 %	-	88%	78.23 %	100%	98.5 %
3	Gyelpzhing HSS	1:27	83.08 %	85.9 %	93.07 %	73.5%	na	na

SI .	School	TPRatio	7	LSSC E
			Pass %	Pass %
30	Bidung LSS	1:34	72.72 %	75.6 %
31	Changangkha LSS	01:33.6	84.44 %	88%
32	Changzamtog LSS	1:48	71.03 %	na

4	J/Sherubling HSS	1:22	-	-	67.89 %	96.7%	100%	100%
5	Nangkor HSS	01:34.7	88.67 %	94.3 %	-	-	na	na
6	Punakha HSS	1:19	64.40 %	100%	62.39 %	67.8%	98.5 %	98.5 %
7	Rangjung HSS		89%	-	-	-	na	na
8	Ugyen Dorji HSS	01:32.2	85%	71.4 %	90.29 %	68.2%	na	na
9	Zhemgang HSS	1:19	95.5%	84.6 %	90.7%	97.6%	na	na
10	Kelki High School	01:22.6	-	-	62%	-	81.6 %	46.9 %
11	Chhumey MSS	1:34	53.7%	94.4 %	-	na	92.4 %	87.2 %
12	Darla MSS	1:49	70%	67.7 %	-	na		
13	Gelephu MSS	1:52	84.09 %	83.8 %	88.57 %	na		
14	Gomtu MSS	1:44	64.44 %	85%	-	na		
15	K/drapchu MSS	1:34	66.67 %	76.9 %	-	na		
16	L/Zampa MSS	1:25	89.27 %	84.1 %	-	na		
17	Monggar MSS	1:22	-	-	66.03 %	88.3%		
18	Motithang MSS	1:18	90%	84.7 %	94.1%	82.6%		
19	Phuntshoi ng MSS	1:27	76.4%	89.6 %	69.15 %	na		
20	S/Jongkhar MSS	1:37	58%	74.2 %	-	na		
21	Samtse MSS	01:33.0	71.75 %	71.7 %	-	na		
22	Sarpang MSS	1:20	82.71 %	89%	84.31 %	89.7%		

33	Choden LSS	1:28	74%	95.5 %
34	Dechheling LSS	1:060	100%	89.7 %
35	Dewathang LSS	1:35	74.72 %	83.6 %
36	Dorokha LSS	1:44	69.33 %	92.3 %
37	Drametse LSS	1:44	84.86 %	96.5 %
38	Drujegang LSS	1:45	50%	96.7 %
39	Gaselo LSS	-	75.55 %	na
40	Kanglung LSS	01:37.3	100%	na
41	Karma LSS	1:22	78.54 %	na
42	Katsho LSS	1:34	81.81 %	na
43	Khaling LSS	1:33	92.42 %	89%
44	Khuruthang LSS	1:31	77.09 %	94%
45	Martshala LSS	1:27	93.54 %	91.9 %
46	Nobding LSS	-	83.07 %	na
47	Orong LSS	-	74.41 %	na
48	Panbang LSS	01:43.9	70.83 %	na
49	Radhi LSS	1:31	92.4%	80.8 %
50	Samtegang LSS	1:48	73.07 %	66%
51	Tsimalakha LSS	1:50	100%	na

2	Shaba	1:42			75.60	
3	MSS		-	-	%	79.3%
2	T/Yangtse	1:38	56.71	84.9		
4	MSS		%	%	-	na
2	Tangmach	1:29	89.92	94.6	64.20	
5	hu MSS		%	%	%	97.4%
2	Trashigang	-		80.1	78.14	
6	MSS		75%	%	%	85.3%
2	Tsenkharla	1:36	77.54	91.8		
7	MSS		%	%		
2	Wamrong	1:41	87.08	93.9		
8	MSS		%	%		
2	Wangchhu	1:40				
9	MSS		88%	95%		

52	Ura LSS	01:59.8	-			100%
53	W/Choeling LSS	-	65.38			89%
54	Wangdue LSS	-	-			81.3%
55	Woochu LSS	1:53	58.76			na
56	Yonphula LSS	1:57		96%		na
57	Yurung LSS	01:59.8		75%		na
				79.63		85.22
			%	%		%

Findings: There are 8 schools whose TP ratio is below 1:30 but where there is under-performance. There are an equal number of schools with TP ratio above 1:50 but who have performed well in the examinations.

Examinations against Teacher-Pupil Ratio - 2000

SI	School	TPRatio	7	LSSC	9	ICSE	11	12
			Pass %	Pass %	Pass %	Pass %	Pass %	Pass %
1	Damphu HSS	1:33	83.5%	91.4%	84.09%	65.9%	-	-
2	Drukgyel HSS	1:23	-		89%	69.9%	100%	98.7%
3	Gyelpzhing HSS	01:35.5	100%	82%	89.69%	70.8%	-	-
4	J/Sherubling HSS	1:28	-		77.16%	90.9%	100%	100%
5	Nangkor HSS	1:25	75%	81.8%	70.62%	-	-	-
6	Punakha HSS	1:26	-	95.2%	71.13%	88.6%	95.3%	98.7%
7	Rangjung HSS	-	100%	79%	87.83%	-	-	-

SI	School	TPRatio	7	LSSC
			Pass %	Pass %
35	Dechheling LSS	1:47	92.85%	56.6%
36	Dewathang LSS	1:30	77.04%	86.9%
37	Dorokha LSS	1:47	75.36%	100%
38	Drametse LSS	1:44	99.2%	na
39	Drujegang LSS	1:49	75.60%	87%
40	Drukgyel LSS	1:31	46.93%	na
41	Gasa LSS	1:27	86%	85.7%

8	Ugyen Dorji HSS	1:30	85.05 %	88%	89.45 %	60%	-	-
9	Zhemgang HSS	1:21	93%	92.5 %	97.5%	91%	-	-
10	Kelki High School	01:22.7	-	-	-	51%	100%	83.9 %
11	Chhumei MSS	1:28	85%	93%	-	-	99.1 %	92.7 %
12	Darla MSS	1:40	54.94 %	70.1 %	-	na		
13	Gedu MSS	-	-	66.2 %	-	na		
14	Gelephu MSS	1:34	88.11 %	92.1 %	87.41 %	na		
15	Gomtu MSS	1:39	65.85 %	100%	-	na		
16	K/drapchu MSS	1:31	80%	65.8 %	-	na		
17	L/Zampa MSS	1:19	88.52 %	82.6 %	-	na		
18	Monggar MSS	1:23	-	-	62.2%	82%		
19	Motithang MSS	1:19	-	73.3 %	85.6%	56.5%		
20	Phuntshoi ng MSS	1:27	66.67 %	91.5 %	74.19 %	79.2%		
21	S/Jongkhar MSS	1:33	60.82 %	67.2 %	59.7%	na		
22	Samtse MSS	01:32.1	86.79 %	86.8 %	-	na		
23	Sarpang MSS	1:21	-	96.4 %	75.84 %	89.5%		
24	Shaba MSS	1:43	-	-	75.26 %	76.2%		
25	T/Yangtse MSS	1:37	100%	100%	93.78 %	na		
26	Tangmach hu MSS	1:29	97.22 %	93.4 %	78.88 %	92%		

42	Gaselo LSSs			81.57 %	93%
43	Kanglung LSS	01:35.4		86.6%	75.5 %
44	Karma LSS	1:21		68.42 %	na
45	Katsho LSS	1:36		86.2%	72.9 %
46	Khaling LSS	1:26		100%	85.7 %
47	Khuruthan g LSS	1:36		73.11 %	86.8 %
48	Lango LSS	1:39		77.775	na
49	Langthel LSS	1:53		55.1%	na
50	Lhuentse LSS	1:53		100%	97.1 %
51	Martshala LSS	1:32		90.72 %	87.1 %
52	Nobding LSS			66.15 %	86%
53	Orong LSS	1:39		70.21 %	88.7 %
54	Panbang LSS	1:43		78.18 %	94.2 %
55	Paro LSS	01:23.9		69.56 %	71%
56	Radhi LSS	1:23		84.61 %	90.4 %
57	Samtegang LSS	1:44		81.94 %	98.1 %
58	Thungkhar LSS	-		100%	na
58	Tshangkha LSS	1:31		77.5%	na
60	Tsimalakha LSS	1:37		67.67 %	54.6 %

27	Trashigang MSS	1:34	78.1%	93.9%	-	na
28	Tsenkharla MSS	1:45	84.53%	69.3%	-	na
29	Wamrong MSS	1:33	81.95%	92.6%	81.69%	na
30	Wangchhu MSS	1:39	80.28%	96.7%	80.8%	78%
31	Bidung LSS	1:32	75.36%			
32	Changangkha LSS	01:33.6	84.35%			
33	Changzamtog LSS	1:36	62.89%			
34	Choden LSS	1:22	69.35%			

61	Ura LSS	01:53.8	92.8%	100%
62	W/Choeling LSS	-	-	98%
63	Wamrong LSS	01:53.9	77.77%	na
64	Wangdue LSS	-	70.12%	92.9%
65	Woochu LSS	1:49	63.71%	75.3%
66	Yonphula LSS	1:51	88.6%	na
67	Yurung LSS	01:53.8	70.76%	91.1%
			78.68%	85.16%

Findings: There are 9 schools whose TP ratio is below 1:30 but where there is under-performance. There are 4 schools where TP ratio is above 1:50 but who have performed very well in the examinations.

Examinations against Teacher-Pupil Ratio - 2001

Sl.	School	TPRatio	7 Pass %	LSSCE Pass %	9 Pass %	ICSE Pass %	11 Pass %	12 Pass %
1	Damphu HSS	1:29	88.6%	92.2%	91.5%	98.3%	-	-
2	Drukgyel HSS	1:21	-	-	85.1%	95.7%	100%	98.2%
3	Gyelpzhing HSS	01:27.2	-	80.5%	83.57%	91.2%	-	-
4	J/Sherubling HSS	1:28	-	-	87.31%	99.6%	100%	98.8%
5	Nangkor HSS	1:30	88.88%	88.8%	87.31%	89.3%	-	-
6	Punakha HSS	1:27	-		76.49%	90%	97.5%	98.3%
7	Rangjung		86.48	75.5	64%	91.9%	-	-

Sl.	School	TPRatio	7 Pass %	LSSCE Pass %
39	Dewathang LSS	1:26	72.41%	73.4%
40	Dorokha LSS	1:55	65.33%	86.2%
41	Drametse LSS	1:38	85.58%	
42	Drujegang LSS	1:36	64.86%	94.6%
43	Drukgyel LSS	1:33	75.4%	96.6%
44	Gasa LSS	1:23	92.85%	92.8%
45	Gaselo LSs		79.56	94.6

	HSS		%	%				
8	Ugyen Dorji HSS	1:32	76.50 %	91.4 %	79.84 %	93.4%	-	-
9	Zhemgang HSS	1:20	78.9%	90.4 %	98%	98.5%	-	-
10	Kelki HSS (Pvt)	1:23	-	-	-	93.3%	98%	87.3 %
11	Nima HSS (Pvt)	1:18	-	-	-	100%	99.1 %	-
12	Chhumey MSS	1:34	92.2%	91%	65.82 %	-	98.8 %	92.4 %
13	Darla MSS	1:54	60.6%	89.2 %	-	-		
14	Gedu MSS		79.16 %		70.29 %	-		
15	Gelephu MSS	1:26	83.01 %	77%	80%	-		
16	Gomtu MSS	1:35	61.62 %	100%	-	-		
17	K/drapchu MSS	1:31	98.70 %	100%	-	-		
18	L/Zampa MSS	1:18	87.03 %	90.3 %	86.36 %	-		
19	Monggar MSS	1:22	-		67.58 %	100%		
20	Motithang MSS	1:17	-		91.11 %	93.3%		
21	Phuntshoi ng MSS	1:23	84.78 %	97.3 %	74.69 %	99%		
22	S/Jongkhar MSS	1:31	64.36 %	86.6 %	48.33 %	94.6%		
23	Samtse MSS	01:31.3	78.76 %	78.7 %	67.92 %	-		
24	Sarpang MSS	1:26	90.82 %	90%	84.33 %	100%		
25	Shaba MSS	1:46	-		85.71 %	98.6%		

			%	%
46	Gonpa Singma LSS	1:41	93.8%	
47	J/ Namgyel LSS	1:33	76%	78.5 %
48	Kanglung LSS	01:35.1	87.93 %	77.3 %
49	Karma LSS	1:16	85%	-
50	Katsho LSS	1:35	74.69 %	85.9 %
51	Khaling LSS	1:27	96%	86.9 %
52	Kheni LSS	1:38	88.57 %	-
53	Khoma LSS	1:36	57.69 %	-
54	Khuruthan g LSS	1:35	85.86 %	83.7 %
55	Kurichhu LSS	-	95.2%	
56	Lango LSS	1:37	50.94 %	95.2 %
57	Langthel LSS	1:53	82%	91.4 %
58	Lobesa LSS	1:37	92.30 %	84.4 %
59	Martshala LSS	1:37	84.07 %	76.4 %
60	Nobding LSS	-	64.70 %	93%
61	Orong LSS	1:40	77.33 %	94.8 %
62	Panbang LSS	01:40.8	84.05 %	100%
63	Paro LSS	01:23.8	69.4%	82.8 %

26	T/Yangtse MSS	1:34	90.32 %	97.9 %	96.52 %	95.3%
27	Tangmach hu MSS	1:28	91.58 %	91.1 %	78.41 %	100%
28	Trashigang MSS	1:34	79.79 %		-	-
29	Tsenkharla MSS	1:48	89.03 %	95.5 %	-	-
30	Wamrong MSS	1:28	80%	98.4 %	90%	92.7%
31	Wangchhu MSS	1:28	72.85 %	84.6 %	66.67 %	-
32	Yebilaptsa MSS	1:39	60.9%	-	81.3%	95.9%
33	Bidung LSS	1:25	83.72 %			
34	Changgang kha LSS	01:29.7	86.85 %			
35	Changzamtog LSS	1:41	76.55 %			
36	Choden LSS	1:27	81.58 %			
37	Damphu LSS	1:44	75.8%			
38	Dechheling LSS	1:49	95.23 %			

64	Radhi LSS	1:28	80.55 %	92.1 %
65	Samtegang LSS	1:46	83.95 %	77%
66	Thungkhar LSS	-	100%	91%
67	Tsebar LSS	01:38.5	76%	-
68	Tshangkha LSS	1:31	88.46 %	100%
69	Tsimalakha LSS	1:31	89.56 %	79%
70	Ura LSS	1:46	71%	100%
71	W/Choeling LSS		62.5%	95.8 %
72	Wamrong LSS	01:56.6	88.23 %	-
73	Wangdue LSS		75%	84.5 %
74	Woochu LSS	1:34	84.61 %	88.4 %
75	Yonphula LSS	1:52	84.9%	-
76	Yurung LSS	1:46	77.33 %	98%
			80.26 %	88.73 %

Findings: There are 3 schools who have low TP ratio but have under-performed in the examinations. On the other hand, there are 3 schools with high TP ratio but have done well in the examinations.

Examinations against Teacher-Pupil Ratio - 2000

SI	School	TPRatio	7	LSSCE	9	ICSE	11	12
			Pass %	Pass %	Pass %	Pass %	Pass %	Pass %

SI	School	TPRatio	7	LSSCE
			Pass %	Pass %

1	Damphu HSS	1:33	83.5%	91.4 %	84.09 %	65.9 %	-	-
2	Drukgyel HSS	1:23	-		89%	69.9 %	100%	98.7 %
3	Gyelpzhing HSS	01:35.5	100%	82%	89.69 %	70.8 %	-	-
4	J/Sherubling HSS	1:28	-		77.16 %	90.9 %	100%	100 %
5	Nangkor HSS	1:25	75%	81.8 %	70.62 %	-	-	-
6	Punakha HSS	1:26	-	95.2 %	71.13 %	88.6 %	95.3 %	98.7 %
7	Rangjung HSS	-	100%	79%	87.83 %	-	-	-
8	Ugyen Dorji HSS	1:30	85.05 %	88%	89.45 %	60%	-	-
9	Zhemgang HSS	1:21	93%	92.5 %	97.5%	91%	-	-
10	Kelki High School	01:22.7	-		-	51%	100%	83.9 %
11	Chhumey MSS	1:28	85%	93%	-	-	99.1 %	92.7 %
12	Darla MSS	1:40	54.94 %	70.1 %	-	na		
13	Gedu MSS	-	-	66.2 %	-	na		
14	Gelephu MSS	1:34	88.11 %	92.1 %	87.41 %	na		
15	Gomtu MSS	1:39	65.85 %	100%	-	na		
16	K/drapchu MSS	1:31	80%	65.8 %	-	na		
17	L/Zampa MSS	1:19	88.52 %	82.6 %	-	na		
18	Monggar MSS	1:23	-		62.2%	82%		
19	Motithang MSS	1:19	-	73.3 %	85.6%	56.5 %		

35	Dechheling LSS	1:47	92.85 %	56.6 %				
36	Dewathang LSS	1:30	77.04 %	86.9%				
37	Dorokha LSS	1:47	75.36 %	100%				
38	Drametse LSS	1:44	99.2%	na				
39	Drujegang LSS	1:49	75.60 %	87%				
40	Drukgyel LSS	1:31	46.93 %	na				
41	Gasa LSS	1:27	86%	85.7%				
42	Gaselo LSSs		81.57 %	93%				
43	Kanglung LSS	01:35.4	86.6%	75.5%				
44	Karma LSS	1:21	68.42 %	na				
45	Katsho LSS	1:36	86.2%	72.9%				
46	Khaling LSS	1:26	100%	85.7%				
47	Khuruthang LSS	1:36	73.11 %	86.8%				
48	Lango LSS	1:39	77.77 %	na				
49	Langthel LSS	1:53	55.1%	na				
50	Lhuentse LSS	1:53	100%	97.1%				
51	Martshala LSS	1:32	90.72 %	87.1%				
52	Nobding LSS		66.15 %	86%				
53	Orong LSS	1:39	70.21 %	88.7%				

20	Phuntshoi ng MSS	1:27	66.67 %	91.5 %	74.19 %	79.2 %
21	S/Jongkhar MSS	1:33	60.82 %	67.2 %	59.7%	na
22	Samtse MSS	01:32.1	86.79 %	86.8 %	-	na
23	Sarpang MSS	1:21	-	96.4 %	75.84 %	89.5 %
24	Shaba MSS	1:43	-	-	75.26 %	76.2 %
25	T/Yangtse MSS	1:37	100%	100%	93.78 %	na
26	Tangmachhu MSS	1:29	97.22 %	93.4 %	78.88 %	92%
27	Trashigang MSS	1:34	78.1%	93.9 %	-	na
28	Tsenkharla MSS	1:45	84.53 %	69.3 %	-	na
29	Wamrong MSS	1:33	81.95 %	92.6 %	81.69 %	na
30	Wangchhu MSS	1:39	80.28 %	96.7 %	80.8%	78%
31	Bidung LSS	1:32	75.36 %			
32	Changangkha LSS	01:33.6	84.35 %			
33	Changzamtog LSS	1:36	62.89 %			
34	Choden LSS	1:22	69.35 %			

54	Panbang LSS	1:43	78.18 %	94.2%
55	Paro LSS	01:23.9	69.56 %	71%
56	Radhi LSS	1:23	84.61 %	90.4%
57	Samtegang LSS	1:44	81.94 %	98.1%
58	Thungkhar LSS	-	100%	na
58	Tshangkha LSS	1:31	77.5%	na
60	Tsimalakha LSS	1:37	67.67 %	54.6 %
61	Ura LSS	01:53.8	92.8%	100%
62	W/Choeling LSS	-	-	98%
63	Wamrong LSS	01:53.9	77.77 %	na
64	Wangdue LSS	-	70.12 %	92.9%
65	Woochu LSS	1:49	63.71 %	75.3%
66	Yonphula LSS	1:51	88.6%	na
67	Yurung LSS	01:53.8	70.76 %	91.1%
			78.68 %	85.16 %

Findings: There are 9 schools whose TP ratio is below 1:30 but where there is under-performance. There are 4 schools where TP ratio is above 1:50 but who have performed very well in the examinations.

Examinations against Teacher-Pupil Ratio - 2001

SI	School	TPRatio	7	LSSCE	9	ICSE	11	12
			Pass	Pass	Pass	Pass	Pass	Pass

SI	School	TPRatio	7	LSSCE
			Pass	Pass

			%	%	%	%	%	%
1	Damphu HSS	1:29	88.6%	92.2%	91.5%	98.3%	-	-
2	Drukgyel HSS	1:21	-	-	85.1%	95.7%	100%	98.2%
3	Gyelpzhing HSS	01:27.2	-	80.5%	83.57%	91.2%	-	-
4	J/Sherubling HSS	1:28	-	-	87.31%	99.6%	100%	98.8%
5	Nangkor HSS	1:30	88.88%	88.8%	87.31%	89.3%	-	-
6	Punakha HSS	1:27	-	-	76.49%	90%	97.5%	98.3%
7	Rangjung HSS		86.48%	75.5%	64%	91.9%	-	-
8	Ugyen Dorji HSS	1:32	76.50%	91.4%	79.84%	93.4%	-	-
9	Zhemgang HSS	1:20	78.9%	90.4%	98%	98.5%	-	-
10	Kelki HSS (Pvt)	1:23	-	-	-	93.3%	98%	87.3%
11	Nima HSS (Pvt)	1:18	-	-	-	100%	99.1%	-
12	Chhumey MSS	1:34	92.2%	91%	65.82%	-	98.8%	92.4%
13	Darla MSS	1:54	60.6%	89.2%	-	-	-	-
14	Gedu MSS		79.16%	-	70.29%	-	-	-
15	Gelephu MSS	1:26	83.01%	77%	80%	-	-	-
16	Gomtu MSS	1:35	61.62%	100%	-	-	-	-
17	K/drapchu MSS	1:31	98.70%	100%	-	-	-	-
18	L/Zampa MSS	1:18	87.03%	90.3%	86.36%	-	-	-

			%	%
39	Dewathang LSS	1:26	72.41%	73.4%
40	Dorokha LSS	1:55	65.33%	86.2%
41	Drametse LSS	1:38	85.58%	-
42	Drujegang LSS	1:36	64.86%	94.6%
43	Drukgyel LSS	1:33	75.4%	96.6%
44	Gasa LSS	1:23	92.85%	92.8%
45	Gaselo LSSs		79.56%	94.6%
46	Gonpa Singma LSS	1:41	93.8%	-
47	J/ Namgyel LSS	1:33	76%	78.5%
48	Kanglung LSS	01:35.1	87.93%	77.3%
49	Karma LSS	1:16	85%	-
50	Katsho LSS	1:35	74.69%	85.9%
51	Khaling LSS	1:27	96%	86.9%
52	Kheni LSS	1:38	88.57%	-
53	Khoma LSS	1:36	57.69%	-
54	Khuruthang LSS	1:35	85.86%	83.7%
55	Kurichhu LSS	-	95.2%	-
56	Lango LSS	1:37	50.94%	95.2%

19	Monggar MSS	1:22	-		67.58 %	100%
20	Motithang MSS	1:17	-		91.11 %	93.3 %
21	Phuntshoi ng MSS	1:23	84.78 %	97.3 %	74.69 %	99%
22	S/Jongkhar MSS	1:31	64.36 %	86.6 %	48.33 %	94.6 %
23	Samtse MSS	01:31.3	78.76 %	78.7 %	67.92 %	-
24	Sarpang MSS	1:26	90.82 %	90%	84.33 %	100%
25	Shaba MSS	1:46	-		85.71 %	98.6 %
26	T/Yangtse MSS	1:34	90.32 %	97.9 %	96.52 %	95.3 %
27	Tangmachu MSS	1:28	91.58 %	91.1 %	78.41 %	100%
28	Trashigang MSS	1:34	79.79 %		-	-
29	Tsenkharla MSS	1:48	89.03 %	95.5 %	-	-
30	Wamrong MSS	1:28	80%	98.4 %	90%	92.7 %
31	Wangchhu MSS	1:28	72.85 %	84.6 %	66.67 %	-
32	Yebilaptsa MSS	1:39	60.9%	-	81.3%	95.9 %
33	Bidung LSS	1:25	83.72 %			
34	Changangkha LSS	01:29.7	86.85 %			
35	Changzamtog LSS	1:41	76.55 %			
36	Choden LSS	1:27	81.58 %			
37	Damphu LSS	1:44	75.8%			

57	Langthel LSS	1:53	82%	91.4%
58	Lobesa LSS	1:37	92.30 %	84.4%
59	Martshala LSS	1:37	84.07 %	76.4%
60	Nobding LSS	-	64.70 %	93%
61	Orong LSS	1:40	77.33 %	94.8%
62	Panbang LSS	01:40.8	84.05 %	100%
63	Paro LSS	01:23.8	69.4%	82.8%
64	Radhi LSS	1:28	80.55 %	92.1%
65	Samtegang LSS	1:46	83.95 %	77%
66	Thungkhar LSS	-	100%	91%
67	Tsebar LSS	01:38.5	76%	-
68	Tshangkha LSS	1:31	88.46 %	100%
69	Tsimalakha LSS	1:31	89.56 %	79%
70	Ura LSS	1:46	71%	100%
71	W/Choeling LSS		62.5%	95.8%
72	Wamrong LSS	01:56.6	88.23 %	-
73	Wangdue LSS		75%	84.5%
74	Woochu LSS	1:34	84.61 %	88.4%
75	Yonphula LSS	1:52	84.9%	-

	<p>Paper II consists of: Comprehension passage, Poetry, Dialogue construction, Cloze text, Meaning of phrasal verbs and expressions, Sentence making with expressions.</p>	<p>Summary writing – 10 marks Q.4 – Grammar: Rewriting sentences – 10 marks Fill in the blanks – 5 marks Suitable form of given word – 5 marks</p> <p>Paper II: 2 hours, 80 marks. To answer 5 questions from 3 texts choosing at least one from each text (Drama, Poetry, A collection of Short Stories). Each Question is worth 16 marks.</p> <p>Same pattern of papers</p>	<p>Q.4: Comprehension – 30 marks</p> <p>Paper II: 3-hour paper. Must answer 5 questions in all.</p> <p>Q.1 is compulsory. 4 other questions to be chosen from different texts including Shakespeare.</p> <p>Paper set as per pattern.</p>
Mathematics	<p>Two parts to the paper. PART A consists of multiple-response questions and PART B consists of word problems.</p> <p>Questions worth 30% - 50% of total devoted to multiple response questions.</p>	<p>The duration of writing the paper is 2½ hours. Section A is worth 40 marks. Section B is worth 40 marks. In section A there are 7 main questions consisting of 2 minor questions each. Alternately, there are 20 questions requiring short answers. All questions to be answered in this section. Section B contains 7 questions out of which only 4 are to be answered.</p>	
Science	<p>Variation in time duration for writing paper - 2 hrs and 2½ hrs. Equal division of marks between A & B.</p> <p>Two parts to the paper. PART A consists of multiple-response questions for 50 marks. PART B consists of essay questions requiring higher order of cognitive skills. Explaining. Giving reasons. Differentiating. Stating. What do you understand by...? What is...? Why...? Drawing diagrams.</p>	<p>Two parts – A and B Section A is compulsory. Multiple-choice questions, True – False questions, Matching, Rewriting in logical sequence, Identifying, Fill in the blanks. Choice in section B: Explaining, differentiating, reasoning, defining, stating, describing, identifying relationships, classifying. Naming labeled parts in a diagram, drawing diagrams, distinguishing between two or more things, What do you understand by ...?</p>	<p>PHYSICS: 3-hour paper. PART I and PART II. Part I is compulsory. It consists of short-answer questions. Part II is divided into Sections A, B and C with 3 questions each. Two questions each are to be answered from each section. BIOLOGY: 3-hour paper. PART I and PART II. Answer all questions in PART I and five questions from PART II (three from section A and two from section B) CHEMISTRY: 3-hour paper. PART I and PART II Part I is compulsory. Part II is divided into Sections A, B and C with 3 questions each. Two questions each are to be answered from each section.</p> <p>Papers set as per pattern</p>
History	<p>PART I: Multiple-response questions. Fill in the blanks. Match the following. True or False.</p>	<p>Give an example...? Mention...? Why is it...? How many...? What would you like...? What does...? Who...? Describe...? What was the...? In what respect...? Justify the statement...? How has</p>	

	PART II: Essay questions.	<p>the...?</p> <p>Make a comparison...? Which do you consider...? Justify...? What would have happened if...? Define...? How do you prove...? Explain...? Fill in the blanks? Describe...? What do you mean by...? Mention...? Give reasons...? Who is...?</p> <p>Question paper format is similar to that of the BBE. The paper is divided into 2 parts. Each part has sections. There are choices for answering. Maximum Mark is for 80 and the time for writing is 2 hours. There are short-answer and essay questions. Most of them are of recall-type.</p>	
Geography	<p>2 hour paper. PART A & B. PART A consists of multiple-response questions. PART B consists of essay questions.</p> <p>Give reasons. Why...? What are...? How? Map work.</p>	<p>Contour map. Outline map. What do you think? Mention, what does the term...? Why? Which? Draw. Calculate? State. What do you understand by...? What are...? How? Give reasons.</p> <p>2 hours. FM is 80.</p> <p>ZHSS: Define. Describe. Explain. Mention. Distinguish. What are...? Give reasons. Discuss. Outline map. 2 hours. FM is 80.</p> <p>P/ling: Compare and contrast. Diagram. What do you mean by...? With help of diagram, explain...? What is the relationship between...? What is meant...? Define. Why? Differentiate? What is known...? Which is...? Distinguish between...? How does...? To what does ...? Describe. Write short notes...? List the...? Mention... What and why...? Outline map. 2 hours. FM is 100.</p> <p><i>The question patterns are akin to those of the BBE. There are higher order questions. The level of difficulty is the same.</i></p>	<p>PART I and PART II. All questions in PART I are compulsory. PART II contains two sections A and B. Choice to answer 3 questions in A and 2 questions in B. PART I is worth 20 marks. PART B is worth 50 marks of 10 marks each.</p> <p>Paper set as per pattern.</p>

**Analysis of the Lower Secondary School Certificate Examination Results (LSSCE
- Class VIII) December 2002
- BBED**

Abstract

This is an executive summary of the year 2002 Lower Secondary School Certificate Examination result analysis. The summary presents information on the national, dzongkhag and school level performance with respect to the overall pass percentage and subject-wise pass percentage and mean desegregated by gender. It also highlights some trends in performance over the past three years - 2000 to 2002. It also suggests some issues and recommendations.

Findings

1. Based on the pass % and means, the boys are performing better than the girls at all levels – national, dzongkhags and schools.
2. Over the past three years, there has been an increase in the number of schools and students appearing at the LSSC examinations. The number of students passing has also increased. There is also a drop in the number of students not appearing at the examination. For the December 2002 examinations, there were more boys dropping out (115) as compared to the girls (105). The boys are doing better than the girls.

Year	No. of Sch.	Abst.			Total app.			Over all Pass %		
		Boys	Girls	Total	Boys	Girls	Total	Boys pass %	Girls pass %	Total pass %
2000	69			310	3359	2747	6106	86.48 (2905)	82.52 (2267)	84.74
2001	77			271	3648	3022	6670	89.19 (3254)	86.96 (2628)	88.19
2002	86	115	105	220	3714	3340	7054	91.65 (3404)	90.20 (3013)	90.97

3. Unlike in the past two years - 2000 and 2001, more boys have passed in English as compared to the girls at the national level. However, the mean for the girls is slightly better than the one for boys.

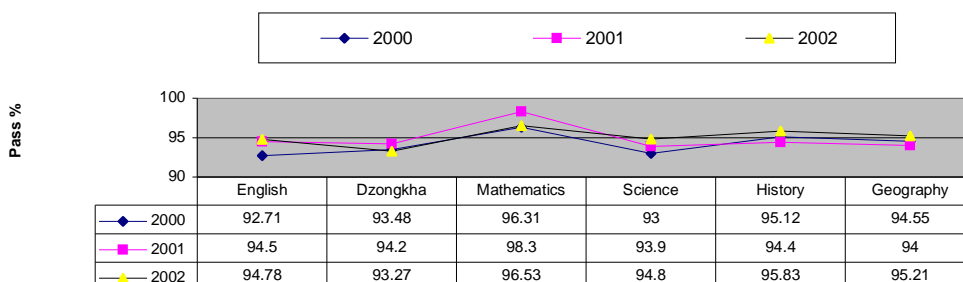
Year	Pass %		Mean
	Boys	Girls	
2000	92.71	93.34	
2001	94.5	95.3	
2002	94.78	93.71	53.27 53.3

4. At the national level, the pass % in Dzongkha and Science has improved over the years. There are variations in the other subjects.

Year	Dzo.	Eng.	Mat.	Sci.	His.	Geo.
2000	92.14	93.00	90.54	91.07	92.04	91.79
2001	93.78	94.89	97.51	92.35	91.7	91.25
2002	94.27	93.29	96.17	93.92	94.58	93.95

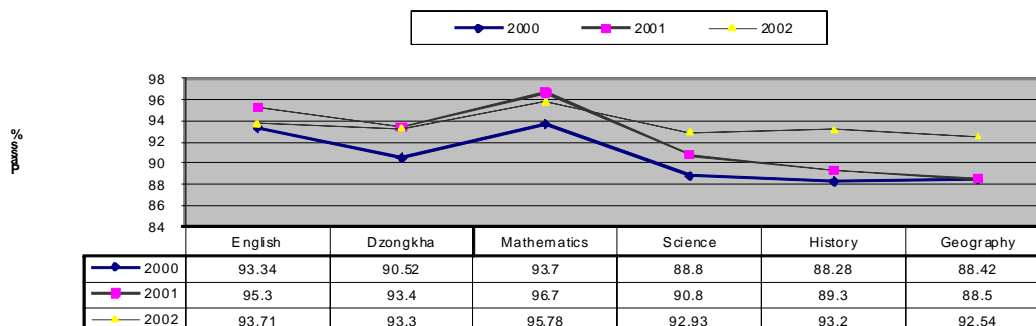
5. For the boys, there has been an improvement in performance in subjects like English, Science and Geography over the past three years. However, there are variations in performance in Dzongkha, Mathematics and History.

Comparison of Subject-wise pass % for boys, Nation



6. For the girls, there is improvement in performance in Science, History and Geography. There are slight variations in performance in English, Dzongkha and Mathematics.

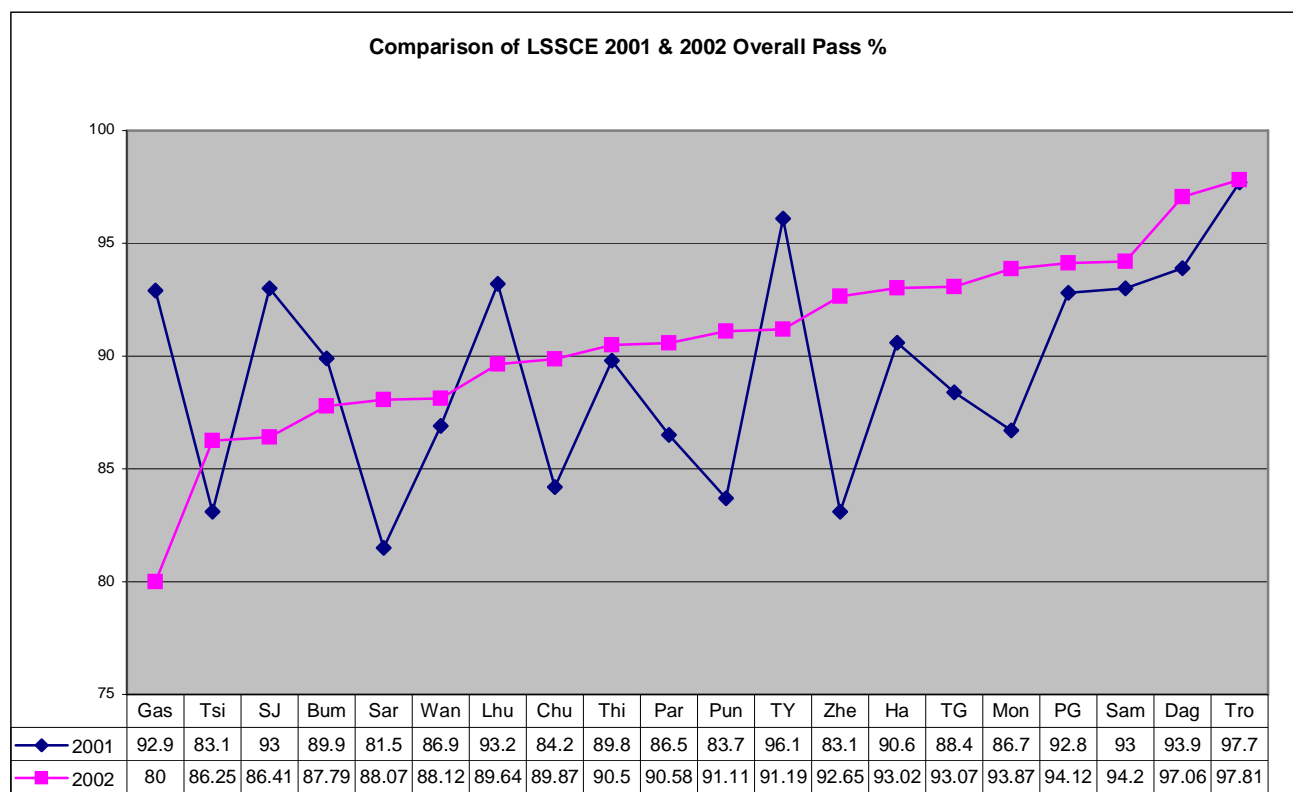
Comparison of Subject-wise pass % for girls, Nation



7. The subject-wise mean has improved over the years especially for Dzongkha, History and Geography.

Year	Dzo.	Eng.	Mat.	Sci.	His.	Geo.
2000	47	50	50	50	47	47
2001	52	53	53	53	53	53
2002	53.29	53.31	53.27	53.28	53.3	53.29

8. Trongsa Dzongkhag has performed well (the same observation was made last year). The other dzongkhags which fall in this category are Dagana, Samtse, Pemagatshel, Mongar, Trashigang, Ha, Zhemgang, Trashiyangtse and Punakha (pass percentage is above the national pass percentage, 90.97). The remaining dzongkhags are doing fairly well (pass percentage ranged from 86.3 (Tsirang) to 90.6 (Paro) except for Gasa (80) because of the poor performance in English by the girls.



9. A comparison of the over-all pass percentage for 2001 and 2002 for the dzongkhags.

Years	Pass percentage range		
	Nation	Maximum	Minimum
2001	88.19	97.7 (Trongsa)	81.5 (Sarpang)
2002	90.97	97.81 (Trongsa)	80 (Gasa)

Sarpang Dzongkhag has improved its performance in the 2002 examinations (88.1%)

10. The performance of the following dzongkhags has gone down in the December 2002 examinations as compared to December 2001:

Dzongkhags	Years & Pass percentage	
	2001	2002
Gasa	92.9 %	80 %
Samdrupjongkhar	93%	86.4%
Trashiyangtse	96.1%	91.2%
Lhuentse	93.2%	89.6
Bumthang	89.9%	87.8%

The remaining dzongkhags have improved their performance from the year 2001. (See previous page)

11. The performance of girls is better than that of boys in Tsirang, Sarpang, Punakha, Zhemgang and Thimphu.

	2001			2002	
	Girls	Boys		Girls	Boys
Gasa	100%	88%	Tsirang	90.5%	82.6%
Samtse	95%	92%	Punakha	93.8%	88.7%
Thimphu	91%	89%	Sarpang	89.6%	86.7%
Sarpang	83%	80%	Zhemgang	93.5%	92%
			Thimphu	90.6%	90.4%

In 2001, there were four dzongkhags where the girls performed better as can be seen in the table above.

12. In Gasa and Wangdue, the performance of the girls was poor. In the years 2000 and 2001, the girls in Gasa did better than the boys. In Gasa, the girls' performance in English was poor (only 69.23% passed) whereas in Wangdue, the performance in Dzongkha was poor (pass percentage 87.27%). Both English and Dzongkha are major subjects.
13. In year 2001, the performance of girls of Samdrupjongkhar was poor but they improved in 2002.

2001		2002	
Girls	Boys	Girls	Boys

74%	87%	85.3%	87.2%
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14. The subject-wise pass percentage (total) for the dzongkhags ranged from 99% in Mathematics (Ha) to 84% in English (Gasa).

Subjects	Pass Percent		
	Nation	Dzongkhags	
		Maximum	Minimum
English	94	98 (Tro)	84 (Gas)
Dzongkha	93	98 (Tro)	88 (Sar)
Mathematics	96	99 (Ha)	94 (Lhu)
Science	94	98 (Tro)	87 (Bum)
History	95	98 (Tro)	89 (Bum)
Geography	94	98 (Dag)	91 (Par)

It can be concluded that Trongsa Dzongkhag is doing well (*look at the maximum column*) because it has the highest pass percentage in four subjects (English, Dzongkha, Science and History). On the same line, Ha has the highest pass percentage in Dzongkha and Dagana in Geography.

15. The boys are doing better in all subjects as compared to the girls especially in Trongsa and Gasa. (*look at the maximum and minimum columns for both boys and girls*). The girls in Dagana, followed by Samtse and Ha are doing better as compared to those in other dzongkhags. (*look at the maximum column for the girls*)

Subjects	Pass percent			
	Boys		Girls	
	Maximum	Minimum	Maximum	Minimum
English	100 (Tro & Gasa)	87 (Tsirang)	98 (Samtse)	69 (Gasa)
Dzongkha	100 (Tro & Gasa)	86 (Tsirang)	99 (Dagana)	87 (Wan)
Mathematics	100 (Trongsa)	93 (Sarpang)	99 (Ha)	92 (Gasa)

Science	100 (Tro & Gasa)	88 (Tsirang)	99 (Dagana)	84 (Bum)
History	100 (Tro & Gasa)	91 (Tsirang)	99 (Samste)	85 (Gasa)
Geography	100 (Tro & Gasa)	91 (Tsirang)	99 (Dagana)	85 (Gasa)

16. The means (total) across subjects for the dzongkhags ranged from 46 in English (Gasa) to 59 in Science (Zhemgang) and Geography (Dagana).

<i>Subjects</i>	<i>National Means</i>	<i>Dzongkhag/s Means</i>	
		Maximum	Minimum
English	53	58 (Samste)	46 (Gasa)
Dzongkha	53	58 (Dagana)	49 (Sarpang)
Mathematics	53	56 (Trongsa)	49 (TY)
Science	53	59 (Zhemgang)	48 (Bumthang)
History	53	56 (Dagana)	49 (Bumthang)
Geography	53	59 (Dagana)	50 (Bumthang)

Dagana has the highest means in three subjects (Dzongkha, History and Geography) followed by Zhemgang in Science, Samtse in English and Trongsa in Mathematics.

Although Trongsa was doing well in terms of overall and subject-wise pass percentage, Dagana did well in terms of quality.

17. The table given below shows that the performance of boys is better except in English where the mean is slightly higher for the girls (59). This is similar to the national trend. The range of the subject means shows a variation in performance amongst the boys, girls and between boys and girls.

Subjects	<i>National Means</i>		<i>Dzongkhag/s Means</i>			
	Boys	Girls	Boys		Girls	
			Maximum	Minimum	<i>Maximum</i>	Minimum
English	53	53	57 (Sam)	49 (Bum)	59 (Sam)	41 (Gasa)
Dzongkha	55	52	60 (Lhu)	50 (Tsi)	57 (Dag)	48 (Sar)
Mathematics	55	51	61 (Dag)	51 (Lhu)	54 (Thi)	45 (TY)
Science	55	52	62 (Gasa)	49 (Bum)	58 (Zhe)	46 (Bum)
History	56	51	63 (Gasa)	52 (Tsi)	52 (Sar)	46 (Gasa)
Geography	55	51	63 (Dag)	52 (Tsi)	55 (Sam)	46 (Gasa)

18. The schools with 100% pass percentage are:

Sl. No.	Schools			
		Boys	Girls	Total
1.	Trongsa MSS (Trongsa)	28	28	56
2.	Khaling LSS (TG)	28	21	49
3.	Radi LSS (TG)	18	16	34
4.	Panbhang LSS (Zhe)	40	12	52
5.	Yadi LSS (Mon)	47	22	69
6.	Nagor LSS (Mon) 1st time	6	3	9

19. The schools with pass percentage of 80% and below are:

Sl. No.	Schools				
		Pass %	Boys	Girls	Total
1.	Zilukha LSS (Thi)	80	92(75)	98(74)	190
2.	Damphu LSS (Tsi) - 1st time	77.94	35(26)	33(27)	68
3.	Khasadrapchu (Thi)	76.62	33(23)	44(36)	77
4.	Karma Pvt. LSS (Chu)	76.19	14(11)	7(5)	21
5.	Martshalla (SJ)	71.31	76(55)	46(32)	122

20. The boys in the following schools have pass percentages of 80 and below.

Sl. No.	Schools	Pass %	Unsucc.	Total No. of stds.
1.	Wamrong LSS (TG)	80	30 - 24 = 6	67
2.	Karma Pvt. LSS (Chu)	78.57	14 - 11 = 3	21
3.	Damphu LSS - (Tsi)- 1st time	74.29	35 - 26 = 9	68
4.	Martshalla LSS (SJ)	72.37	76 - 55 = 21	122
5.	Khasadrapchu MSS (Thi)	69.7	33 - 23 = 10	77

21. The girls in the following schools have pass percentages of 80 and below.

Sl. No.	Schools	Pass %	Unsucc.	Total No. of stds.
1.	Lobesa LSS (Thi)	78.79	33 - 26 = 7	69
2.	Nobding LSS (Wan)	78.57	14 - 11 = 3	42
3.	Zilukha LSS (Thi)	75.51	98 - 74 = 24	190
4.	Ghumauney LSS (Sam) - 1st time	72.22	18 - 13 = 5	39

5.	Karma Pvt. LSS (Chu)	71.43	7 - 5 = 2	21
6.	Matshalla LSS (SJ)	69.57	46 - 32 = 14	122
7.	Gasa LSS (Gas)	69.23	13 - 9 = 4	25

22. The subject-wise pass percentage for the schools varied as follows:

<i>Pass percentage</i>			
Subjects	National	Schools (Max - Min)	No of schools with 100%
English	94	100 - 79	9
Dzongkha	93	100 - 76	6
Mathematics	96	100 - 86	15
Science	94	100 - 77	9
History	95	100 - 81	10
Geography	94	100 - 82	9

The table shows that students performed well in Mathematics (15 schools) followed by History (10 schools), English (9 schools), Science (9 schools), Geography (9 schools) and Dzongkha (6 schools).

23. The boys did better in subjects like Mathematics (37 schools) followed by History (33 schools), English (28 schools), Science and Geography (25 schools each) and Dzongkha (20 schools). (See table given below)

For the girls, it was Mathematics (25 schools), History (20 schools), English (19 schools), Science (17 schools), Geography (16 schools) and Dzongkha (15 schools). The trend is similar to the one for boys. (See table given below)

<i>Pass percentage</i>					
Subjects	National	Boys (Max - Min)	No of schools with 100%	Girls (Max - Min)	No of schools with 100%
English	94	100 - 76	28	100 - 69	19
Dzongkha	93	100 - 76	20	100 - 71	15
Mathematics	96	100 - 85	37	100 - 82	25
Science	94	100 - 71	25	100 - 73	17
History	95	100 - 85	33	100 - 57	20
Geography	94	100 - 81	25	100 - 71	16

24. Nagor LSS is doing well as it has the highest means in two subjects (Dzongkha and Mathematics) followed by Khasadrapchu MSS in Science, Lungtenzampa MSS in English, Orong in Geography and Minjiwoong in History.

Subjects	National Means	Dzongkhag/s Means	School/s Means	
		(Max - Min)	Maximum	Minimum
English	53	58 - 46	66 (Lzampa)	44 (Mart)
Dzongkha	53	58 - 49	66 (Nagor)	40 (Karma)
Mathematics	53	56 - 49	65 (Nagor)	46 (Yong)
Science	53	59 - 49	67 (Kdrapchu)	43 (Deo)
History	53	56 - 49	62 (Minji)	43 (Wling)
Geography	53	59 - 50	63 (Orong)	45 (Gonpa)

25. The maximum means for the boys is greater for subjects like Mathematics, Science, History and Geography. The maximum means for English and Dzongkha is better for the girls.

Subjects	Means			
	Boys		Girls	
	Maximum	Minimum	Maximum	Minimum
English	64 (Ckha)	41 (Kdrapchu)	70 (Lzampa)	41 (Gasa)
Dzongkha	69 (Khoma)	40 (Karma)	70 (Nagor)	41 (Karma)
Mathematics	69 (Nagor)	46 (Deo)	64 (Pbhang)	40 (Darla)
Science	69 (Khling)	40 (Deo)	65 (Kling)	38 (Darla)
History	65 (Dgang)	45 (Wling)	60 (Lzampa)	38 (Darla)
Geography	67 (Radi)	44 (Kdrapchu)	60 (Lzampa)	39 (Darla)

Conclusion

Considering the indicators used for this analysis (pass rates and means), it could be concluded that the overall performance at the national level is satisfactory as the proportion passed is over the minimum expectation of **85%**.

However, there are variations in the pass rates and means showing that the levels of performance varied widely across districts and schools. The schools doing well and not doing well could be affected by many factors. There is a need to explore the factors causing these conditions in schools.

Issues and Recommendations

1. Schools like Zilukha (190) and Martshalla (122) LSSs did not perform very well.

This could be due to the large number of students, crowded classrooms, lack of adequate teachers and other resources.

2. Some schools like Damphu (68) and Ghumauney (39) LSSs sat for the December 2002 examinations for the first time and did not do very well. This could be due to lack of experienced and adequate number of teachers and other resources. When schools are upgraded, we need to equip them with experienced and adequate teachers and other resources.
3. The girls in Gasa and Wangdue did not do very well in English and Dzongkha. We need to find out the factors that influenced their poor performance in these subjects.
4. The DEOs could further analyse the graphical analysis sent by the BBED to help the schools in their respective dzongkhags.

* * *

Centre for Educational Research and Development

Goals

- 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 concerned agencies in education for consideration of policy options in relation to relevant educational goals, content, and methodology;
- Provide a forum for educators and researchers to support action-research and professional development for enhanced performance by our education stake-holders.
- 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 Educational Assessment*, among others.

CERD has been working closely with CAPSD especially in the review and revision of the English curriculum – PP-XII, and supporting the Dzongkha Development Authority in the production of bilingual dictionaries.

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

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:

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