Developing Reflective Thinking: Encouraging Pre-service Teachers to be Responsible for their own Learning.

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Abstract

In pursuit of quality education in Bhutan there has been a desire to shift from teacher-dominant class teaching to students taking initiative in their own learning. This paper investigated the issue of moving teaching and learning from teacher-centered classes to independent learning of students. The research was carried out at Samtse College of Education, Royal University of Bhutan (RUB) with B. Ed first year science student teachers who were majoring in chemistry as one of their major subjects. This co-educational class had 28 student teachers at the age range of 20-25 years of which 11 were females. The research commenced in August 2008 and completed in November 2008. Because this research involved changing and approach in my own class I have adopted action research using Kemmis & McTaggart's (1998) model modified by Maxwell (2003) starting with reconnaissance and generating action research questions.

Data were gathered over time from a variety of strategies such as observation of student teacher's presentation and discussion, reflective writing, critiquing an article, and class test. The data findings are authenticated using researcher's observation, feedback from critical friend, and diary notes.

A tally was used to record their participation in the classroom activities such as the frequency of questions raised, clarifications sought, volunteering to do presentation, and taking initiatives in the group work. The data collection also involved student teachers maintaining class journals and writing reflective paper. The journals and reflective papers were marked based on the criteria set. A class test was also conducted to check their ability to answer higher order questions.

The findings from this multiple sources reveal that student teachers are more open for discussion and interaction after the intervention action, and their write-ups and views are more analytical and reflective. What impressed me most was these student teachers, who were usually quite and distant themselves from the tutor, became so close with me toward the end of the semester.

This study was successful as I could reap the fruits of my desired goals. My colleagues were overwhelmed by the progress student teachers made after the intervention and they would like to model my strategy in their class in the immediate future.

This research project is timely for a young university like RUB, as research activities are very crucial for the improvement of educational programs. Lately, we see a number of promising scholars taking up research activities but these activities are often inhibited by lack of research funds and short of research ideas. This research would help kick start

research activities as more people are interested in action research as it is more viable given the limited time and budgetary constraints. Moreover, action research can be undertaken in the workplace and is intended to enhance the quality of a researcher's normal professional activities (Maxwell, 2003).

Introduction

Research is a crucial element for any institution and lack of research activities can obstruct the improvement of education programs. In Bhutan with the institution of Research Department in the Royal University of Bhutan (RUB), a clear research policy for the member colleges is in place. The RUB supports member colleges in research capacity building and allocates research grants to aspiring researchers. Lately, we see a number of promising scholars taking up research activities but these activities are constrained by limited research funds, heavy teaching loads for faculty, and lack of research ideas. Recently there is a growing interest in action research in Bhutan as it is more viable given the limited time and budgetary constraints. Moreover, action research is undertaken in the workplace and is intended to enhance the quality of a researcher's normal professional activities (Grundy, 1995; Maxwell, 2003).

Action research as discussed by LoCastro (1995) is "one form of classroom centered research which is seen as being small scale and situational focused on a particular problem, to try to understand and perhaps solve some concrete problem in an individual teacher's classroom" (p.5). Kemmis & McTaggart (1988) and Maxwell (2003) characterize action research as a spiral in nature in the sense it is a cycle of planning, observation, and reflection on the part of researcher with the goal of finding a solution to specific classroom problems. Moreover the cycle is developed from an action research question which itself is derived from a thorough reconnaissance (Maxwell, 2003; Kemmis and McTaggart, 1988). Action research can facilitate the professional growth of teachers:

i. in practices (e.g. facilitating students' learning);
ii. in the situation (e.g. re-arranging the classroom); and
iii. in understanding of both (i & ii)

(Grundy, 1995, p. 9).

Reconnaissance

Reconnaissance is derived from a French word 'reconnaitre' which means to look at. According to Maxwell (2003), reconnaissance has three parts, namely, situational analysis (looking at situation in terms of a range of factors such as resources and practices); competences [the profile and competences of researcher(s)]; and literature (linking with the previous work in this field). The reconnaissance is carried out prior to the planning phase of the cycle in order to identify a specific or particular area, understand the classroom situation to find the gaps which can be redeemed by undertaking action research.

Situational Analysis

Bhutan is situated in the eastern Himalayas and is sandwiched between two Asian giants - China to the north and India to the south. Bhutan is known to the outside world through is miniature size of 38,394 sq. km. It is mostly mountainous and has forest coverage of 72.5% (NSB, 2006). Bhutan has a small population of 634,982 who are good natured people and provide generous hospitality. It has a literacy rate of 59.5%, and an unemployment rate of 3.1% (OCC, 2005). Bhutan's estimated per capita gross domestic product (GDP) was $834 according to the Prime Minister's Report to the 83rd Session of the National Assembly in June 2005. More importantly, Bhutan is identified globally for its policy of Gross National Happiness (GNH).

The Samtse College of Education, Royal University of Bhutan

Samtse is one of the 20 districts in Bhutan. It is located to the south-west and is inhabitated by 'Lhotsampas' which means people from southern Bhutan. Samtse shares a border with the Indian state of West Bengal. It is a leading district in the production of limestone, mica, sand, cement, alcohol and canned food products. Samtse district has only one tertiary institution, Samtse College of Education, which is located in Samtse itself.

With the advent of modern education in Bhutan in the early 1960s, curriculum and teachers were drawn from India. These teachers were alien to our culture and were unable to contextualize their teaching to suit Bhutanese students. More importantly for this project the influence of Indian pedagogy has been felt right to the present day, namely it teacher-centred approach to teaching and learning (Gyamtso, 2008). In pursuit of training Bhutanese teachers the erstwhile Teacher Training Centre (TTC) was set up in Samtse in 1968 by late His Majesty the third king of Bhutan and subsequently it was upgraded to a degree college in 1983. Since then, the College has expanded to over 600 students and 54 lecturers today. It offers both pre-service and in-service programs. The pre-service programs include B. Ed secondary & primary programs and Post Graduate Diploma in Education (PgDE). The in-service programs include B. Ed primary and Lead Teachers' program for Maths and English Teachers.

I have been a faculty member for the last seven years, teaching science, Functional Information Technology (FIT), and Professional subjects. Throughout these years what raised concern in me and my colleagues most was the lack of initiatives by the student teachers to learn. They also lacked curiosity. Most student teachers failed to think critically which resulted in low creativity and a non-reflective disposition. They tend to rely on the notes provided by the lecturers in the classroom or notes passed on by their seniors from the previous class and regurgitated in the exams. Their answer sheets revealed duplication of lecturer's notes or notes copied from the books. More particularly, their reflection papers are mainly narrative stories of the proceedings rather than being reflective and analytical. They seldom question lecturers in the class or refute their friends' arguments in discussion.

All of these can be attributed in part to a number of facts such as inadequate library resources, limited classroom & ICT facilities, and high teacher-student ratios. Secondly, the student teachers receive free education and their jobs are guaranteed once they graduate with the B. Ed degree. Thirdly, due to cultural inhibitions, many student teachers tend to be very self-effacing. They have high regard for their lecturers and they don't dare to question them, even if the lecturers are wrong. So as a result, they are on the receiving end and teaching becomes one-sided. The students' own histories of learning, based on the Indian model, contribute to this situation. As a consequence student teachers fail to learn analytical and critical skills. Such practices place the quality of education at risk as it encourages student teachers to rely on lecturers' notes. Teaching is confined to the four walls of the classroom and within the realm of the textbook. This further inhibits their critical thinking as they fail to apply knowledge and develop higher order thinking skills.

My class

The class I chose to conduct my research was B. Ed first year science. These student teachers take chemistry as one of their major subjects and come from higher secondary schools located around the country. Most Bhutanese schools face an acute shortage of teachers. Sometimes the classes go for months without teachers. So, as an interim measure they resort to non-specialised teachers in filling the gaps The module that I taught was chemistry education. This co-educational class had 28 student teachers at the age range of 20-25 years of which eleven were females. This was their first year in the College and when I undertook action research with them in August 2008, they had just completed a semester in the College. They were well versed in English and communicating in English with them was not a problem.

In two years time these student teachers will graduate and get their placement in different schools around the country and teach future citizens. What can we expect from school students who were taught by teachers lacking analytical and reflective skills? There is a dictum saying only a "Lighted candle can light another candle." It is likely to produce a multiplying effect on the cliché "Like teachers like students." For some of these school students their time in school could be their last formal education. How I model chemistry teaching will be important for their futures.

Competence

I have served in various capacities. I was a teacher, an administrator and currently a teacher educator. During action research period, I was teaching chemistry, FIT and other professional subjects. I also look after the B. Ed secondary program in the capacity of Program Leader and I coordinate research activities in the College. In the course of my eight years teaching at the College, I have tried to promote reflective thinking in my students by covering relevant topics and adopting varied teaching/learning strategies as I strongly believe that unless you take the ownership of your own learning you are not motivated enough to learn. The same feeling is also echoed by my colleagues in the College. This research was inspired by the idea that students can take the initiative of

learning on their own *with sufficient direction and support from the lecturers*. The aim of this research was to shift the focus from a teacher dominant class toward independent student learning incorporating reflective practice.

Literature

Here I would like to present the views expressed by various researchers and my own analysis on reflective thinking that reflective thinking leads to criticality. Being critical and analytical helps in thought processes and making good judgements. Learning environment is critical in promoting reflective thinking through the provision of peer tutoring, giving students ample time to think, scaffolding in the class and advocating learner centred strategies.

Reflection and Criticality

There is a wealth of information regarding reflective thinking. The inability on the part of student teachers to reflect has become an issue at the forefront of education-related discussions and in the professions generally. The growth and development of knowledge requires students to learn, not only how to use resources to locate relevant information, but also how to make sense of this information. In order to decide which resources are useful and reliable, higher-order thinking is essential (Lin, Hmelo, Kinzer, & Secules, 1999). As Allen (1987) writes, it is important to teach students to think critically.

The definition of "reflective thinking", which is repeated over the years, is that reflective thinking is active, persistent, and careful consideration of a belief or supposed form of knowledge in the light of the grounds that support it and the further conclusion to which that knowledge leads (Dewey, 1933).

However, other researchers added to this definition and modified it. Thus, According to Le Riche (1998, p. 34) reflective practice "involves the practitioner in a continuous internal dialogue in which the relationship between the professional self and the personal self is kept alive and thought about." Central to the concept of reflective practitioner is openness, integrity and balance between personal and professional lives.

Adam (2002) posits that reflectiveness leads to criticality. It is not enough to be reflective. Rather, we need to use the understanding that we gain from reflection to achieve change. In other words, reflective thinking is viewed as a thinking process reflecting specifically on the process about what has happened. This process leads students to assess what they know, what they need to know and how they would learn the information to make judgements to construct their knowledge (Kim & Sharma, 1999).

Kuhn (1991) provides a definition of critical thinking as a type of reasoned argument with a social element. She claims a number of skills are required that involve:

i. a student's ability to differentiate their own theory or point of view from the evidence that can be brought to bear on it;
ii. to support their point of view or theory with non-spurious evidence;

iii. to suggest possible alternative theories and evidence that would support them;
iv. to provide evidence that supports one's own theory whilst at the same time refuting the alternatives; and
v. finally, to adopt an epistemological stance that involves weighing up and evaluating the evidence (p. 23).

Koszalka, Song, & Grabowski (2002) discovered that students perceive a learning environment as one of the most important factors that prompt and support their reflective thinking. Their learning environment refers to the flexible learning climate such as students' freedom in the classroom, peer work, teaching strategy and having the time to think. According to Ross (1990) and Wood and Wood (1996), while trying to foster reflective thinking in students, one needs to consider potentially important factors such as teachers' teaching strategies and scaffolding in class (question prompt, instructional strategies), tasks (making observations, asking questions, comparing their understanding with those of others), tools (discussion, tutoring and peer evaluation), and learning atmosphere (having freedom and time to think).

Teaching Strategies and Scaffolding

Critical thinking is an important skill for any students to enable them to make self judgments for the understanding of theories, evidence and the core issues in most disciplines. A study carried out by Pithers and Soden (2000) suggest effective strategies such as guided practice and scaffolding to direct students through the thinking process by assessing their current level of thinking through conversation and then asking questions to move them into the next level.

Scaffolding instruction as a teaching strategy originated from sociocultural theory of Lev Vygotsky and his idea of *zone of proximal development* (ZPD). ZPD is defined as the gap between what students know on their own and the next learning that they can be helped to attain with support (Raymond, 2000).

Scaffolding is an instructional technique whereby the teacher models the desired learning strategy or task, then gradually shifts responsibility to the students (Yelland & Masters, 2005). Clay and Cazden (1992) point out two scaffolding strategies such as working with new knowledge if students fail to understand a particular text and accepting partially correct responses and builds on through probes and cues. The same technique is shared by Moon (1999) who says teachers can prompt students' reflective thinking by asking questions as well as explaining reflective concepts to students. Another scaffolding strategy is for the teacher to model the appropriate thinking or working skills in the classroom. In other words, asking questions that seek reasons and evidence can prompt students' reflection, and providing some explanations to guide students' thought processes during explorations can provide an opportunity to support their reflective thinking.

The types of tools that scaffold students' reflective thinking, such as reflective journal writing, asking questions and interactions, and concept maps, are important in fostering students' reflective thinking (Kinchin & Hay, 2000). There is a shared assumption of educators that reflective writing can promote reflective thinking (King & Kitchener, 1994 & Ross, 1990).

Tasks

In the class, students' thoughts should be challenged and provoked by providing complex problem solving and challenging tasks during learning (Hopson, Simms, & Knezek, 2001). In other words the use of reflective thinking can be prompted while students are engaged in active learning, inquiry and problem solving (Yelland, 1999). Students engage in reflective thinking when they encounter problems with uncertain answers, when they believe no one answer is correct, and when the solution cannot be derived by formal logic (Dewey, 1933 and King & Kitchener, 1994).

The literature recommends concept maps as a task to monitor students thinking and understanding. According to Vanides, Yin, Tomita, & Primo (2005) a concept map is a graphical representation of the relationship among terms. It provides a unique graphical view of how students organize, connect, and synthesize information.

Concept maps provide students to:

- Think about the connections between the terms being learned;
- Organize their thoughts and visualize the relationships between key concepts in a systematic way; and
- Reflect on their understanding. (Vanides, Yin, Tomita, & Primo 2005, p.28)

In other words, concept maps facilitate students to think intensely about the topic by helping them to better understand and organize what they learn, and to store and recover information more competently. The students also articulate and challenge their thoughts about the task when they discuss their maps with their friends.

A carefully designed concept map activity can be a tremendous asset in inculcating reflective thinking in the students.

Crossword puzzles are fun to do and make your mind think. Teachers and parents use crosswords to review vocabulary and lessons for all subjects. Students may actually even *enjoy* doing the assignment! Crossword puzzles encourage logical thinking and correct spelling (Shortz, n.d.).

According to Hamle (2008) the following are the educational values of crossword puzzles and engaging them in such activity would enhance student teachers critical thinking.

- First of all, crossword solving involves several useful skills including vocabulary, reasoning, spelling, and word attack skills.

- To solve any crossword puzzle, a person must be able to identify and understand the terms being used. This often involves acquiring new vocabulary or terminology.
- Correctly deciphering a crossword also requires exact spelling, which for students may mean practicing dictionary skills.
- Other important skills required for completing these puzzles include making inferences, evaluating choices, and drawing conclusions.
- Another benefit of using crossword puzzles in the classroom is that they are associated with recreation, and can be less intimidating for students as review tools.
- Puzzle solving is a much more active type of learning, and will engage students with the material more than passive types of review techniques do.

The third task literature proposes is creating awareness to Bloom's taxonomy. In 1956, Benjamin Bloom headed a group of educational psychologists who developed a classification of levels of intellectual behavior important in learning. Bloom identified six levels within the cognitive domain, from the simple recall or recognition of facts, as the lowest level, through increasingly more complex and abstract mental levels, to the highest order which is classified as evaluation.

Blooms higher order questions such as analysis, synthesis, & evaluation involve logical thinking and reasoning including skills such as comparison, classification, sequencing, cause/effect, patterning, analogies, deductive & inductive reasoning, forcasting, planning, hypothesizing, & critiquing (Krathwohl, Bloom, & Masia, 1973).

Learning Environment

The learning environment in which students engage can be an important factor prompting their reflective thinking. According to Koszalka et al. (2002) students perceive a learning environment at its best when it includes flexibility as it enhances their reflective skills. Research also promotes learner centered environment as a powerful means to foster reflective thinking. It attributes more flexible atmosphere, time, tasks, and peer tutoring. (Song, Grabowski, Koszalka, & Harkness, 2003).

Action Research Question

Based on the literature of reflective thinking and situational analysis, I posed the following question:

How can I help pre-service teachers develop reflective thinking skills?

The Action Plan

Planning involved data gathering and also action plans. The plan followed for data gathering during the action research cycle was:

1. **Observation of student's presentation and discussion:** The tutor kept records of students conduct and behaviour in the course of session such as number of questions raised, frequency of clarifications sought, volunteering to do presentation, taking initiatives in the group work, any sort of misbehaviour, peer interaction and interaction with the tutor.

   The role of a critical friend was very essential here. During my entire study period he acted as my guide and mentor. He observed my lessons, kept record of the class proceedings, marked the reflective journals and answer scripts. He also moderated marks awarded for reflective journals and unit test by the tutor. Having critical friend helped to recover some missing data, and in portraying an authentic and objective interpretation.

2. **Reflection paper:** Here the student teachers were asked to write a reflective paper on the proceedings of a particular session using specific marking criteria *(Appendix A)*

3. **Critiquing an article**: Each student teacher was asked to critically analyse an article on science education and share with the class. The analysed paper was marked using specific marking criteria *(Appendix B)*.

4. **Question/ Answer (Unit test):** After the completion of a unit, a test was conducted to check their ability to answer higher order questions using Bloom's Taxonomy.

To ensure trustworthiness of my study, I triangulated my findings using multiple sources of data both for the baseline and post data. These sources were further triangulated with researcher's diary notes and transcripts of a critical friend. Questions of same difficulty level were administered though the topics were different for the class test. The science articles meant for critical analyses were also of the same difficulty and standard marking criteria were used to assess their reflective journals and articles.

Ethics are of great concern in research, especially when human subjects are involved. I have assured my participants that it is my responsibility to safe guard them from any delirious effect. Their views will remain confidential and their names will not be revealed.

The execution of the plan commenced in the first week of August and went through 2nd week of November though there was some disturbance in the middle owing to visit of senior government officials and important national celebrations (see Table 1).

The action plan for my research is also presented in Table 1 in the matrix adapted from the Kemmis & Mctaggart (1988).

Table 1: Action Plan

Plan/Weeks	AUGUST 2008				Remarks
	First week		Second week		
1. Baseline data 1	Observation on students' discussion and presentation.	Reflection by students on the proceedings of a particular class.	Critiquing an article	Question/ Answer (Unit test).	Researcher keeps notes of the daily proceedings.
	Third week		**Fourth week**		
2. Baseline data 2	Observation on students' discussion and presentation.	Reflection by students on the proceedings of a particular class.	Critiquing an article	Question/ Answer (Unit test).	Researcher keeps notes of the daily proceedings.
	SEPTEMBER 2008				
3. Analysis of baseline data 1 & 2	**First & Second week - September 2008**				
	Third week		**Fourth week**		
4. Intervention Strategies	Scaffolding.	Concept mapping.	Reflective writing skills.	Peer and group interaction.	Researcher keeps notes of the daily proceedings.
	OCTOBER 2008				
	First week		**Second week**		
5. Post data collection 1	Observation of trainees' discussion and presentation.	Reflection by trainees on the proceedings of a particular class.	Critiquing an article	Question/ Answer (Unit test).	Critical friend will be involved during the post data collection.
6. Post Intervention Strategies	**Third & Fourth week – October 2008**				
	NOVEMBER 2008				
7. Post data collection 2	**First week**		**Second week**		
	Observation of trainees' discussion and presentation.	Reflection by trainees on the proceedings of a particular class.	Critiquing an article	Question/ Answer (Unit test).	Critical friend will be involved during the post data collection.
	Third & Fourth week – November 2008				
8. Analysis of post data	Analysis & Report writing.	Analysis & Report writing	Analysis & Report writing	Analysis & Report writing	
	DECEMBER 2008				
9. End of action research/Repeat 1,2,3,4.	Video of seminar presentation and finalisation of report writing.				

I used an extra period in the evening after the normal session as the semester, usually 17 weeks, got shortened to 15 weeks to make up for the days which were missed as national

holidays and important national celebration days. However, the use of an extra period in the evening was not a very good idea as one or two students kept missing the class as they had to attend to sporting events and co-curricular activities. So I had to timetable the class during the working hours and this was possible as some lecturers were away on field visits.

Baseline Results

Base Line Data

The data was collected using four different methods. The first was general observation of how student teachers behaved and interacted during presentations and discussions. This method of data collection involved recording a tally of evidence. A tally was used to record the frequency of number of questions raised, frequency of clarifications sought, volunteering to do presentation, taking initiatives in the group work, any sort of misbehaviour, peer interaction and interaction with the tutor.These observations were recorded in the tutor's diary, which was used during the whole action research cycle. These observations were the primary source of data and other data were compared to this overtime.

Baseline data are used as a comparative, benchmark for data collected during and after the intervention. During the first session, eleven students participated in the discussion (seven males and four females) and in the second session only ten students took part in the discussion out of which six were males. The frequency of their participation was only once. Their views on the topic of discussion were mere facts and lacked analysis and references. Only one student sought clarification. Most of the students were shy and lacked eye contact. Students seldom volunteered to participate unless invited. They kept their heads down during questions. Apart from discussion in the classroom the students did not approach me for help. One student asked a question to clarify his doubt to confirm what he knew about a particular idea. However, the other members laughed and mocked him making him feel stupid and dull. The students appeared uncomfortable to raise questions or present their views and findings. They mumbled while speaking or sought solace in the group through chorus answer.

The second method of data collection involved student teachers writing a reflective paper on the proceedings of a particular class/session. Here the students' understanding of the topic looked fairly good but they lacked clarity. Their essay was more of summary rather than being reflective. No analogies were drawn as required while writing the reflective paper. In several instances, the sentences were not structured properly and there were some spelling errors. Some did make a reference to other ideas but failed to acknowledge the source. The journals were marked based on the criteria set and the class averages for the journals were below 40 percentage. Many of the student teachers had failed to consider all aspects of marking criteria (Appendix A) even though the criteria had been provided beforehand.

The third method of data collection required student teachers to critique an article. Here each student teacher was asked to critically analyse an article on science education and

share with the class. The paper was marked using specific marking criteria. The class average for the article was below 45 %. The observations on the critiquing of an article revealed that they were very good in comprehending the article but lacked analytical skills. Their write up was more of narrations and summary. They had committed as many as eleven spelling errors and four punctuation errors on the average (Appendix B – marking criteria for critiquing an article).

After the end of every unit, a class test was conducted using Bloom's Taxonomy to check student teachers' ability to answer high order questions. The class average for the first test was 45% and class average for the second test was 62 % which was quite encouraging.

Intervention Programmes

The data from the two base line study revealed that the student teachers ability to reflect and critical thinking as very poor. 70% of the students preferred to take a back seat and not involve in class discussion. Their mean score on the journal reflection and analysis of articles were below 45%, and the test results were not very encouraging either. These data confirmed my earlier concerns.

As suggested by various studies, strategies such as concept mapping, crossword puzzle, awareness to Bloom's Taxonomy, and scaffolding was used as a teaching strategy to enhance reflecting thinking in student teachers.

As recommended by Raymond (2000), constructivist approach was used to discern students' understanding of concept mapping, crossword puzzles, and Blooms taxonomy. It was noted that almost all the student teachers were aware of the above concepts. Concepts like concept mapping and crossword puzzles were used in lower classes as past time activity but with limited focus. They were also introduced to Blooms Taxonomy in the earlier semester but still have difficulty in differentiating one level from another especially between high order questions and low order questions.

In line with Vygotsky's description of scaffolding instruction (Raymond, 2000), the "role of teachers and others in supporting the student's development and providing support structures to get to the next level" (p.176). So for two weeks (10 hours) I conducted rigorous sessions on concept mapping, crossword puzzle, and Blooms Taxonomy. Some of the exercises include brief description of the concepts, its history, educational values, and hands on experience. These exercises continued till students got the grasp of the above activities as the important feature of scaffolding instruction is that the scaffolds are temporary measures. As the student's shows improvement or progress in their task the scaffolds provided by the tutors are gradually withdrawn. In other words, it is intended that the students are gradually able to master the concepts on their own.

Students' writing was also addressed in the classes. The students' work samples also revealed that they have not fulfilled most aspects of criteria set for journal reflection and critiquing an article. As part of intervention programmes we revisited the criteria and also

discussed at length the Gibbs reflective cycle which is our model for reflective practices It was also noticed that their referencing practices were non existent though they were oriented to it in the beginning. A session was conducted on referencing and documentation styles.

Data over time

The same methods of data collection were used after the action plan was implemented so that any improvement made could easily be identified.

Before execution of the plan commenced, I was bit apprehensive that improvements in my students may not be evident in a short period of time. Besides, the student teachers and I had to attend to other activities.

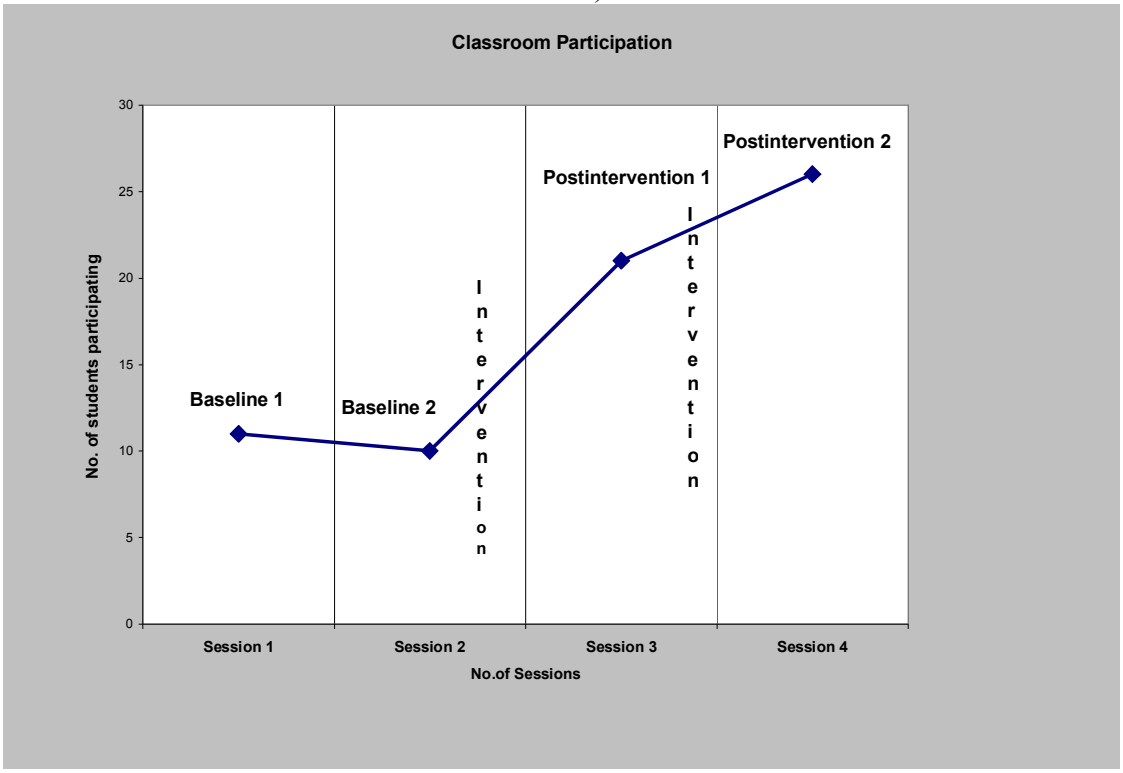
Classroom Participation

My critical friend recorded the following transcript during his observation.

> Initially, the student teachers were meek and shy. They seldom took part in the class discussion unless forced to or asked by the tutor to speak. The students appeared very tense in the classroom and in order to avoid questions from the tutor they keep their heads down. It was also noticed that the few students who wished to partake in the discussion were ridiculed by others. But after the implementation of the action plan I was taken aback to see improvements in the way students were speaking and interacting.

The way female students opened up was surprising and satisfying for me. From my own diary, the views expressed by students were more reflective rather than mere duplication of others ideas. The students became supportive of each other when their response did not make sense or when they failed to understand some concept. For instance before the intervention student teachers would laugh or make fun when their friends fail to answer. But in the post intervention the student teachers were supportive of each other through prompts and cues thus encouraging their friends. The transcripts also showed reduction in prompts given by the teacher or call-out by the teacher for students to answer questions or take part in the discussion. Figure 1 clearly shows a steady improvement in the number of students taking part in the discussion after the intervention programme.

Figure 1: No of students taking part in the classroom activities (before & after action)



Journal Reflection

Student teachers' samples of reflection and self analysis of a session topic in the form of a journal showed a marked improvement in the post data. The class mean score revealed that the improvement was almost double. Initially their journal looked more like a summary of the class proceedings, which lacked abilities to reflect and make judgements, and contextualise their discussions. In support of these data (Figure 2), the transcript of my critical friend also stated that, initially, the student teachers' journal papers were more of narrations of what happened in the class. Though their paper showed strong evidence of understanding of a topic they lack clarity and strengths in presenting their opinions and ideas. Their paper also lacked ability to reflect, judge and evaluate its implications in the given context.

But the post intervention papers showed maturity and professional touch. Their work portrayed some reflective elements such as presenting strengths and weaknesses of the session, trying to discuss in the Bhutanese context, and integrating their opinions and experiences. The graph (Figure 2) noticeably shows a steady escalation in the class mean score obtained by student teachers and thus their reflective ability. For example:

Journal reflection sample (before action)

Session on Chemistry in the field of Medicine

On 8th August 2008, during a science class, a group of presenters presented on the topic chemistry in relation with pharmaceuticals and medicines. Chemistry can have an integral effects on the pharmaceuticals. The composition of different medicines and drugs require an accurate proportion of chemicals. Chemicals do have a great implication in the field of medicinal science. To learn about the chemical compositions of medicinal drugs can have an access towards a vast knowledge. People have a typical notion about the drugs. They usually don't feel the essence of a single medicine in curing different diseases. Eg. Paracetamol being used as analgesics and as pain killer is misunderstood by the people and thus feel frustrated when the physician prescribes them a medicine like paracetamol.

Journal reflection sample (after action)

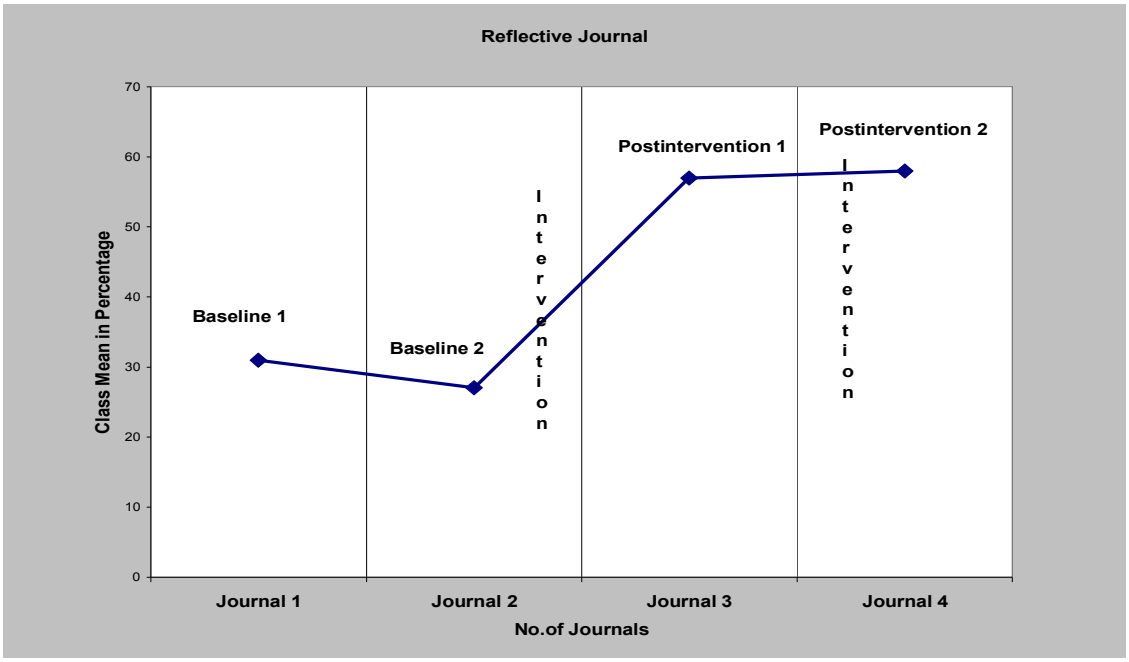
A session on Gender and Science

What has gender got to do with science? Is the subject 'Science' so masculine in nature that threatens every girls from taking it up? These very question intrigues every individual to explore why most girls ignore taking up science. Yet, girls prefer taking up Commerce and arts instead of science. The situation is very apparent especially in the Bhutanese society. In order to get an understanding, there was a lesson taught on 'Gender and Science' in one of the science class where we discussed some major points on gender and science.

I also believe that modern girls are more vigilant and energetic, special person of caliber and worthy of esteem, ready to step to the battlefield unlike in the past. So, with sprouting of such ladies, in the coming years, there will be a drastic change in the women statistic undoubtly.

As many of the female students leave school at the higher grades, the curriculum should be designed to be a terminal and useful package of skills for those who will be leaving as well as for those who will be heading for higher studies (Education Department, 1984).

Figure 2: Class average marks obtained in reflective journal (before and after action plan)



Critiquing an article

The graph on figure 3 provides further evidence that the student teachers have progressed in their ability to reflect and critically analyse. There is a steady increase in the class mean score (from 40% to above 70%).

The student teachers post data work no longer represents summary of the article. They have tried to discuss the article in the Bhutanese context highlighting strengths and weaknesses of the article in the given context. What amazed me and my critical friend was student teachers went on to draw an analogy between the experiences in the article with their own experiences. They have also discussed the article in the light of other literatures. They have also raised some important questions. The way they have synthesised and paraphrased others' ideas was commendable. For example:

Critiquing of an article sample (before action)

Article: But That's Not Fair – Nancy Kaplan

The article "But That's Not Fair" is about an activity being carried out between the teacher and the student. The activity is base on child friendly because there is lots of interaction between the teachers and the students. Here, the students are very much curious to know which ball will bounce higher. So, without any hesitation they comments on the unfairness of the activity done by the teacher and they further

argue with the teacher. Their argument with the teacher clearly states that the children are more observative and clever. Here …… article.

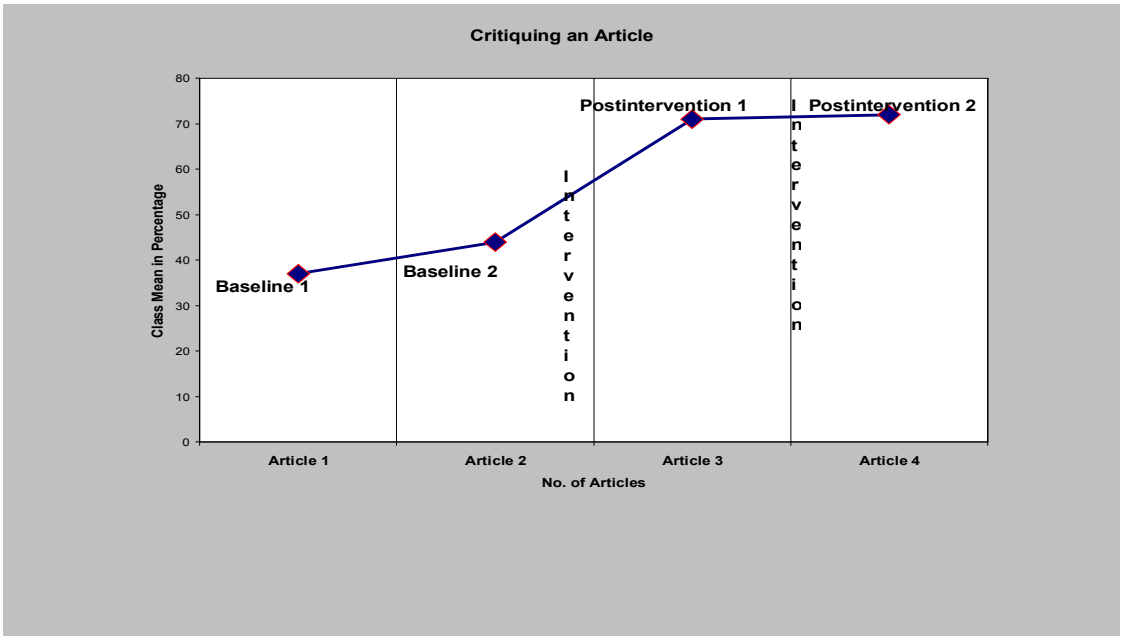
Critiquing of an article sample (after action)

Article: An Indian Father's Plea – Robert Blake

Everybody is special in their own little world and ways. One should not neglect this fact and have a negative opinion about an individual. Your judgments can often be misleading and deceiving. So can it be taken into a great accountability in terms of educational context? Being a teacher one should be philanthropic and farsighted in dealing with your students. You should try to wear every student's shoes and fit in well.

This very article talks about this very aspects as discussed above. It talks about the pathetic harassments a child undergoes being socially and culturally new to a new state. Misgrading of culture is atrocity. Instead being a teacher, one should be well versed in understanding the backgrounds of students which is totally lacking in the teachers of this particular school we are referring too in this article. Not everybody can become what they are not accustomed to. No one can be like Cleopatra to conquer this world with beauty, neither can be like Hercules to lift this world and nor can anybody be like Albert Einstein. Yet, following their traits is an integral asset one can always adopt towards building oneself. Thus, the freedom should be given to the students and let them explore their own little worlds which is just the reverse in case of this article.

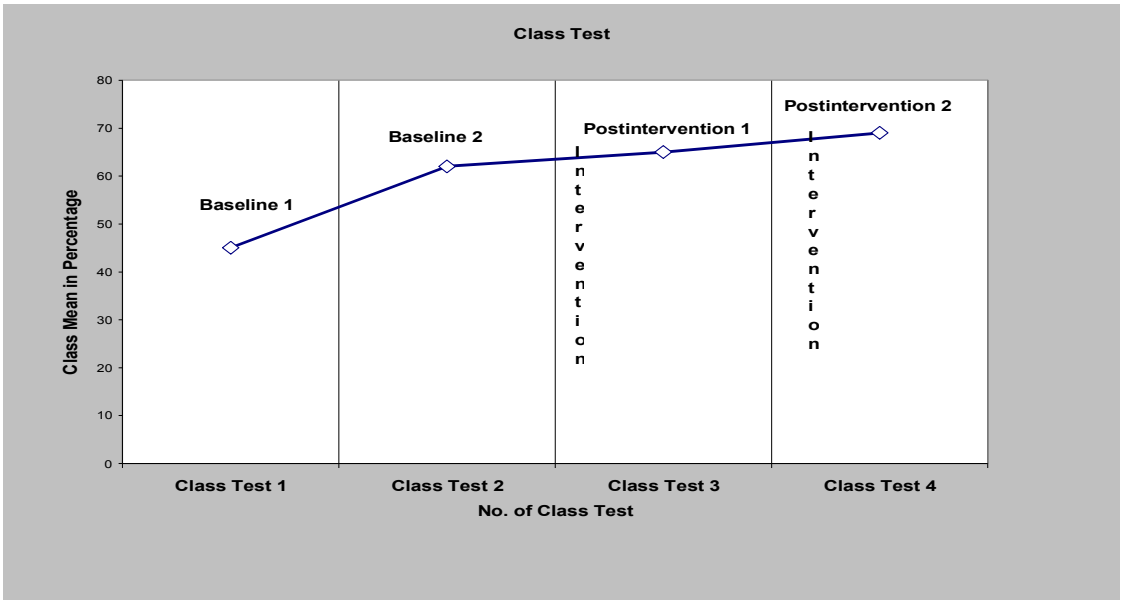
Figure 3: Class average marks obtained in article analysis (before and after action plan)



Class test

I was quite relieved and excited to see the improvements in the way student teachers were able to score good marks in open-ended questions and questions which demanded higher order thinking toward the end of the study. My critical friend was also appreciative of their achievement in a very short span of time. However, they continued to commit spelling errors despite repeated reminders and corrections.

Figure 4: Average Marks obtained in Class Test (before and after action)



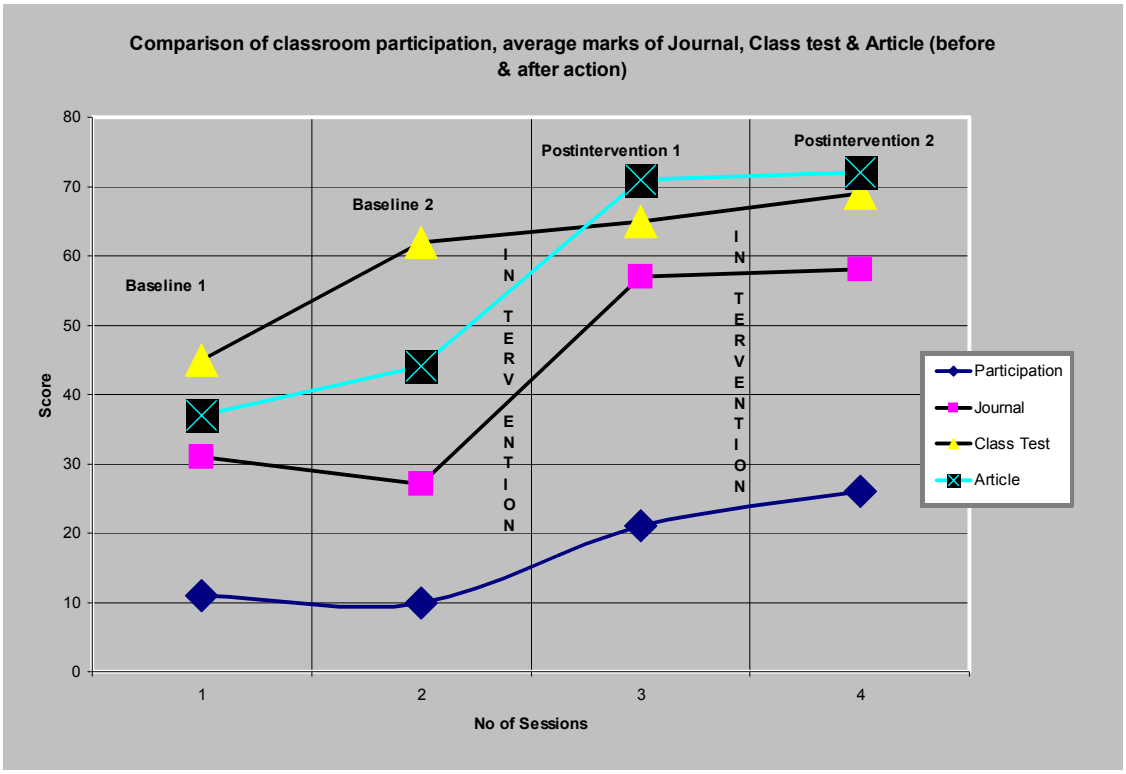
Triangulation of multiple data source

The student teachers who initially need to be called out or coerced to partake in the classroom activities, volunteered to participate in the classroom discussion after the intervention action. They became more curious and often challenged tutor about the particular concept which is an indicative of student teachers becoming more reflective and critical as reflected in figure 5.

Their performance in the journal writing and critiquing skills improved dramatically as indicated in figure 5. Their journal paper and analysis paper not only encompasses narrations of the class proceedings or summary of an article but reveals integration of their own experiences and assessment of strengths and weaknesses of the class proceedings and article as well. Their papers were less of summary and more of analytical and paraphrased ideas.

Student teachers high score in the unit test is a suggestive of the students' ability to score in higher order question. In summary as indicated in figure 5, the student teachers ability to critique an article, write reflective journal in the light of other literatures, answer open questions and participate in the classroom discussions is an indicative of student teachers ability to reflect and analyse.

Figure 5: Comparison of Student Teachers Classroom participation, Class average marks of Journal, Class test and Article analysis (before and after action)



Possible Second Action Research Cycle

After reflecting on the first action research cycle it is evident from the result that this study has brought improvement in student teachers' ability to be reflective and analytical. However, the work sample of student teachers continues to have spelling errors and grammatical errors. Some of them commit as many as 14 spelling errors and 5 grammatical errors in a single write up of 1-2 handwritten pages. Throughout my study period, I tried to redeem their mistakes by pointing out spelling and grammatical errors, reading the correct spellings to them and correcting the grammar. I consider this as a grave problem and if this trend continues, the consequences will be dire as the students in the schools are going to model their teachers. A colleague of mine pointed out incorrect spellings as prominent weaknesses in student teachers' work in Bhutan and he attributed this problem to their poor reading habits (Jose, 2008). If a second action research cycle had to be developed as an extension to the first, it would be on how to help student teachers to spell correctly and write English sentences correctly without grammatical error.

Conclusions

This study was successful as I could reap the fruits of my desired goals. I have begun to assist students to become more reflective in their learning.

I was able to fit my study into the daily routine so it did not disturb the normal curriculum. In other words, the study was contextualised; the goals set were realistic and considered student teachers' capabilities and learning needs. Another positive aspect of my study was the flexibility of the planning. Quite often the research plan gets jeopardized owing to non availability of resources, or visit of senior government officials, public holidays, schools activities, etc. (Mcintyre, 2007). In fact, there was some disruption in my study owing to some very important national celebrations, the visit of senior government officials to the college and at times, some of my students were engaged in the co curricular activities. This did not affect the participation of my students and their performance levels as I was able to reschedule my class to some other days.

Prior to the study, most of my colleagues agreed that the area I chose was relevant. When I shared my results I was showered with positive comments by my colleagues, senior authority, and my critical friend. Some of them were overwhelmed by the progress student teachers made after the intervention programmes were implemented; they wish to model my strategy in their class in the immediate future.

As I reflect back after the completion of the Action Research study, I am fully satisfied as I am a better teacher and better researcher now. It not only strengthened my expertise in the area I chose to study but I have enriched my proficiency in Action Research as this is my first action research study. In the words of Black (2004), professional competence is achieved through repeated reflective practice. This not only involves reflecting-in action but reflecting-on action, in order to achieve self-directed teaching (Frid, Redden & Reading, 1998, as cited in Black, 2004).

Action Research is a complex process. The whole ritual of identifying problems, formulating intervention programmes to overcome them, the process of data collection, analysis and reflection is a Herculean task especially for a novice researcher. Nevertheless, the Action Research process continues to provide a consistent and supportive scaffold that embraces the reflection process.

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APPENDIX A

Criteria for Journal Reflection:

- Evidence of the understanding of the topic;
- Clarity and strengths in presenting their opinions and ideas;
- Contextual and relevant discussions;
- Ability to reflect, judge and evaluate its implications for school teachers;
- Referencing (text, other literature and websites).

APPENDIX B

Criteria for Critiquing an Article:

- **POINT:** What are the main points or arguments the author(s) make in the article?
- **EVIDENCE:** What evidence or information is given to support the points, inferences, or arguments? Is the evidence a fact or measurement about something that has actually occurred?
- **RELIABILITY:** What is the source of the information or evidence?
- **PERSUASIVENESS:** Is the evidence consistent with the argument?
- **YOUR TAKE:** What do you agree and disagree with in the article?