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Impact of lecturers' feedback on student learning: A case study in Samtse College of Education

Karma Utha, Ran Singh Tamang, Ngawang Namgyel, Sonam Gyeltshen, Dechen Doma, and Wangmo

Abstract

The present exploratory study was undertaken to find the impact of lecturers' feedback on students' learning by a team of lecturers from Samtse College of Education. The focus was on improving feedback practice in the college. The study involved classroom observation of teaching and learning processes, individual interviews, focus group interviews and analysis of students written assignments. The study sample included 12 Lecturers, 36 students (Bachelor of Education in Secondary and Primary, and Postgraduate Diploma in Education) studying at Samtse College of Education, and 39 sets of written and online assignments.

One of the major findings was lecturers' preference for negative feedback, with little opportunity given to students to improve their work based on the feedback. The other findings included lecturers' uncertainty on when to give feedback to students' work, the lack of feedback in major assignments, and communication gaps in the use of generic feedback.

Some of the recommendations are: to disseminate information to the College lecturers at the Royal University of Bhutan, especially Samtse College of Education, on the nature of feedback and its implications on students' learning; and to include in the program more minor assignments that are reflective in nature and invite formative assessment, rather than major, summative assignments for which formative assessment is redundant.

Keywords: *Feedback, Negative feedback, Positive feedback, Feedback famine, Generic feedback, Error Correction*

Assessment is an integral part of the teaching and learning process. It is usually broken into two forms: Summative and Formative Assessment, also known as Assessment of Learning and Assessment for Learning respectively (Organization for Economic Co-operation and Development [OECD], 2005; Higgins, Grant, Thompson and Montarzino, 2010). Feedback is an integral part of the formative assessment and helps to determine what has been achieved and what the next goal is in terms of learning. For this study, feedback is understood as the information from the teacher to a learner on the correctness of their work, and how to further improve the work (Utha, 2015). Prior to this study, no research was carried out related to feedback practices in the College.

Samtse College of Education (SCE), previously, Teacher Training Institute, was established in 1968. With its establishment, various modules were offered under different programmes though there is no record of assessment modules offered in the early years. From 1991 onwards, the assessment module, 'Evaluation of Teaching Learning' was offered for the final year students (National Institute of Education, 1991). The focus of the module was completely on summative assessment. In 1997, the module was reviewed and referred to as 'Evaluation and Measurement' with additional content on Continuous Assessment (National Institute of Education, 1997), though the focus was still on summative assessment. Presently, the module is referred to as 'Educational Assessment and Evaluation' and incorporates subtopics on formative assessment.

The standard of current practice of feedback from the lecturers to the students in SCE has been shown to need development. For example, both students and lecturers frequently express disappointment and frustration in relation to the conduct of the feedback process (External Examiners Report, 2012 & 2013). The practice is not currently effective as many lecturers have not undertaken any basic course in giving feedback. Each faculty follows a variety of feedback

procedures that they have either learnt from colleagues or from their personal experience. Hence, effectiveness in the practice is questionable. This has had some implications for the quality of assessment in the past, present, and with all probability, might lead to serious issues in times to come (ibid). One such significant implication would be a long-term impact as many of the teachers in the Bhutanese education system graduate from SCE. Student teachers during their training period would observe and learn from hands-on practice that their lecturers undertake in giving feedback to them on their quality of work. Therefore, this study aims to uncover the type of feedback provided by the lecturers of Samtse College of Education (SCE) and the effectiveness of that feedback on students' learning. The study also intends to research the best practices of feedback that lead to meaningful learning for students.

The findings of the study would be beneficial to the Colleges under the Royal University of Bhutan, as well as others working in similar situations, to understand how feedback practices support teaching and learning processes. In addition, it will assist the Colleges, in particular, SCE, to make informed decisions on the improvement of feedback practices to enhance the teaching and learning environment. The study would also have a positive impact on school assessment practices as the lecturers would model good practices that the student teachers may learn and carry into their professional career.

Literature study

According to Lev Semenovich Vygotsky, a Russian psychologist whose work focused on the social and historical contexts in the psychology of learning, every child has two levels of mental development. The first level called "the actual level of development" can be detected by the learning tasks the child can solve individually and independently. The second one labelled as 'the potential level' can be detected by the tasks the child can solve in co-operation with the teacher or with more competent peers. The distance between these two levels is termed the Zone of Proximal Development (ZPD) which is defined as,

The distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem-solving under adult guidance or in collaboration with more capable peers (Vygotsky, 1978, p. 86).

One form of intervention by an adult or more capable peer in the ZPD is through formative assessment, particularly feedback, besides many. Teachers need to become aware of the potential of feedback for assisting students to develop their potential in terms of ZPD.

Feedback is an essential component in all learning contexts. It serves a variety of purposes including evaluation of students' achievements, development of students' competencies and understanding, and evaluation of students' motivation and confidence. Sadler (1989) and Baker (2009) connect formative assessment with feedback, stating that teachers use feedback to make programmatic decisions with respect to readiness, diagnosis and remediation. In addition, students use feedback to monitor the strengths and weaknesses of their performances; aspects associated with success or high-quality work can be recognized and reinforced, and unsatisfactory aspects modified or improved. According to Bhutan Council for School Examinations and Assessment [BCSEA], (2013) report, performance improved for students who were given frequent feedback on their homework compared to those students who received no feedback.

However, some research shows that it is common practice for students to spend little time on reading teachers' feedback for various reasons (Crisp, 2007). One reason often cited is that the feedback doesn't make sense to the students. The literature suggests that a part of the problem could be disconnect between the feedback given and the teaching and learning process (ibid). Both students and teachers consider feedback to be primarily a teacher-owned endeavour (Taras, 2003). Another reason cited is 'time and opportunity' since the effectiveness of feedback is lost if it is provided late, or if the opportunity to improve based on feedback is not available. If the feedback is given with the intention of bringing improvement in learning,

opportunities in terms of enough time have to be made available to students to work on the feedback (Clarke, 2005; Wiliam, 2011). Providing helpful, timely feedback, and opportunity to improve the work are therefore essential for increasing student satisfaction and the effectiveness of their learning (Hattie & Timperley, 2007; Shute, 2008). Further, research findings also indicate that the effectiveness of the feedback didn't significantly depend on whether it is given orally or in the written form. What matters is the feedback must be specific to the task at hand and provide detailed information on how to improve the answer (Clarke, 2005; Shute, 2008; Kluger & DeNisi, 1996; Black & Wiliam, 1998a). However, Brookhart (2008) recommends that feedback be made just "specific enough for students to know what to do, but not so specific that it's done for them" (p.6). In addition, Hattie and Timperley advise that feedback be not directed at the individual 'self' like "You are a great student" and "That's an intelligent response, well done" which is often found to be unrelated to the performance on the task (2007).

Method

The research design applied to this study took a qualitative approach since the emphasis was focused on gaining a deeper understanding of the current practices of giving feedback, both written and verbal (in classrooms), and finding valuable aspects of current practice that could be translated to similar situations. The qualitative approach was carried out by employing 12 classroom observations of teaching-learning practice, 12 individual interviews with lecturers, and 6 focus group interviews with students. Since all the researchers were involved in data collection, empirical guides for classroom observation, individual interviews and focus group interviews were developed to assist in data collection, mutual understanding of the researchers, and to cover all relevant areas. Aligning with the research intention, the empirical guides focused on giving and receiving feedback in terms of types used, current practices, frequency, impact on teaching and learning, and constraints in current practices.

The classroom observation was carried out through note taking. The interviews were audio recorded except for three interviews where note taking was implemented. Besides the classroom observation and interviews, document analysis of students' written and online assignments was also carried out. The document analysis was important for this study to get information on the type of feedback provided, its adequacy and relevancy.

The research participants were informed before data collection that the views they share will be used only for educational purpose and their identity will be protected. They were also assured that their names will not be reflected in the write-up.

Sample and Informants

The study included students from the Postgraduate Diploma in Education, Bachelor in Education (Secondary) and lecturers involved in teaching these programmes. The subject taught was not a factor for selection in this study; however, to get wider views, a subject representative is included across all disciplines. The study doesn't attempt to make a comparative investigation of the feedback practices between subjects, rather the variety of classes selected served as a source of richer data on which to understand the current practice.

The informants for this study consisted of 12 lecturers and 36 students. Each lecturer represented a subject group and was nominated by the respective Heads of the Departments in consultation with the individual lecturers. Out of the 36 students, 12 were from Science classes (3 each from Physics, Chemistry, Biology, Maths), 9 from Arts classes (3 each from History, Geography, English), 9 from professional module classes, 3 from Postgraduate Diploma in Education, and 3 from Post Graduate Diploma in Guidance and Counselling. They were selected based on volunteers from the classes whose teaching-learning processes were observed. Each focus group consisted of 3 male and 3 female students from two different classes. 39 sets of assignments (37 written and 2 online) marked by 39 lecturers were

considered for document analysis. Each set of assignment consisted of 6 to 45 individual assignments. During the time of data collection, there were 46 lecturers in SCE. 7 were either out of station or didn't have written assignment components in their module, hence, they were not included in the study.

Data Analysis

The data analysis process involved studying the interview transcripts, written assignments and classroom observation notes. Words or sentences that seemed interesting to the study or were considered to help address the research questions were carefully noted. This process leads to forming five broad themes that were regarded as the most significant, as well as frequently found in the data material:

Generic feedback
Positive feedback
Negative feedback
Error correction
Feedback famine

Besides the above themes, 'Time, Opportunity, and Clarity' were also pointed out as some of the constraints in feedback practices

Besides these above themes, other significant themes were 'time, opportunity, and clarity'. These themes were not included since they didn't directly relate to the type of feedback included, but rather were concerned with issues of providing and receiving feedback.

Generic feedback

Generic feedback in this study refers to the use of symbols like ticks, circles, question marks, underlining, slashing or giving marks in the assignment without any comments. All the lecturers interviewed agreed that they gave generic feedback in assignments and other written papers as a part of feedback, especially when student numbers are high.

> I use underline, circle, and question mark. (L4)

> Yes, it all depends on the number of students. If the student number is more than it is very difficult to write. It is always better to give tick if something is right, underline if something is wrong, or circle it. (L1)

Many of the lecturers pointed out that they don't tell the students what the symbols mean and they were aware that it led to some confusion (L3, L4). Interestingly, a lecturer said that College level students should be able to find out what mistakes they have made by referring to other sources (L8). Only one lecturer said that he/she informed the students as to what each symbol meant.

> ... I tell the students and they know what it is. (L2)

Students in one focus group also agreed that they were informed of what each symbol represented and this was taught in one of the English modules offered (FG5). However, the rest of the focus group students said that in their written assignments the lecturers gave generic feedback and they were not sure what it meant (FG1). One lecturer shared that if the feedback was not clear to students, it is the responsibility of the students to seek clarification from the lecturer (L5). However, students reported they were not sure whether seeking clarification

was worth spending time as the assignments had already been graded and the marks allotted would not change (FG1). The same focus group students mentioned that lecturers sometimes used tick marks, pointing out that the use of it was purposefully done to show that lecturers have corrected their assignments.

The use of generic feedback in the form of symbol was present in all the written assignments. There was no indication as to what each symbol meant, nor was there any means of ensuring or checking that students had made improvements based on the feedback received. For example., an assignment set had a big tick mark running across the page. This did not provide any information as to whether everything written in the assignment was correct.

Positive reinforcement/ positive feedback

Most lecturers stated that positive reinforcement was usually given to the students after identifying their strengths. They believed that focusing solely on students' weaknesses might demoralize them and hinder learning. This uncovered a need to use both positive and negative feedback.

> Definitely, I feel that if you use 50% of the positive feedback I think we should also use 50% of negative feedback, so without positive if we point out negative only it might at time demoralize and then they might think that they are not good at anything. So we should be providing equal positive and negative feedbacks to enhance their knowledge. (L11)

Lecturers stated that there was an improvement in learning when positive feedback was provided, but providing detailed feedback was a concern. Large class sizes, content coverage, and other responsibilities besides teaching were cited by the lecturers as factors that influence the time needed for assignment correction and lesson preparation (L8, L5).

Students accept that positive feedback had far-reaching impacts on improving their learning (FG3), but they shared their awareness that as adults they should have the ability to differentiate between the weaknesses and strengths of their own work (FG4). The FG1 students stated that at times when they received positive feedback this boosted their morale, but the trend of providing feedback to improve their work seemed weak since the students reported that many of the lecturers hardly gave positive feedback in their work. However, one lecturer explained that most of the students submitted assignments that were either copied from friends or from internet sources which do not merit giving feedback (L12).

Some students expressed that in some instances, the positive reinforcement they received from lecturers was usually followed by "you can still improve" comment, which remains abstract and less helpful to them (FG3).

In the written assignments, positive feedback in the form of evaluative feedback involving a judgment by the lecturer was present. This was usually stated in the form of: 'Good work', 'Written well'. These statements lack clarity and specificity.

Negative feedback

In this study, negative feedback is defined as pointing out mistakes students have made in their learning; it is constructive in nature. It is not discussed as punishing feedback (i.e., inflicting pain or threat to student's self-esteem). It is also not one which may discourage further learning in students.

Analysis of the interview data from both lecturers and students showed that negative feedback was most prevalent in the lecturers' practice although it was not noted in the classroom observation of the teaching-learning process.

All the lecturers agreed that positive feedback leads to learning, but agreed that in practice negative feedback is more dominant in their practice (L5, L7, and L8).).Most of the lecturers

admitted that they use negative feedback, except for two lecturers. One expressed hesitancy, while the other admitted having some understanding of the nature of feedback.

Mine is mostly positive, even to those who are not doing well also. I am a person who cannot say your work is not good at all. (L1)

This [negative feedback] I think twice. I think I hardly give any. (…) I think because I know some aspects of how to give and receive feedback. I didn't do a course but I learned through reading. (L2)

Nevertheless, these two lecturers also agreed that mistakes that students have made in their work had to be pointed out.

Lecturers who provided negative feedback highlighted that it was given intentionally when the mistakes were repetitive or when the situation demanded it. They were of the view that negative feedback brought positive changes in students' learning. One lecturer was also of the opinion that positive feedback alone may not bring improvement in learning.

> (…) if it is below standard then it is necessary for them to realize what their weaknesses are. So if we give only positive feedback then they may not work for improvement (L11)

Students across all focus groups expressed that they received positive as well as negative feedback though they agreed negative feedback is most prominent (FG1, FG4, and FG 5). Some students also agreed that negative feedback leads to learning for them and stated that it challenged them to put in extra effort (FG 5). However, all the focus group students expressed that their acceptance of the negative feedback depended on the lecturers' approach in giving the feedback.

> Even if it is negative feedback, I would say the way teacher tells makes the difference. (…). But if my teacher could have told in some other better ways, even though at the end it was negative feedback, I could have at least got inspired to do again. (FG 1)

The students expressed that the feedback provided must be diplomatic and motivating, and it must be acceptable to both the lecturer and the individual student (FG 2, FG 3). In line with the students' expression, almost all the lecturers agreed that one must be tactful while providing negative feedback.

> When you give negative feedback, you have to be careful. (L4)

> (…) you should be very careful as a teacher when you give the feedback. You should not be so rude and you should make students accept and there should be a ground rule that they should be accepting all the feedback and you make sure that it is just for their good and improvement only. So the way you give the feedback depends, and if you're really harsh maybe they will take in a negative sense but if you ensure at the beginning that it is going to bring positive change so teacher should play a greater role. (L11)

Most students also expressed that if negative feedback was not delivered in a constructive manner that motivates them, it affected their self-esteem (FG1, FG4). In one focus group, a student expressed the experience of feeling hurt and discouraged after receiving negative feedback from a lecturer. The same student also expressed that giving negative feedback without providing an opportunity to improve the work serves no purpose.

> I felt that this feedback was not needed because if I couldn't have improved, this feedback will not help me. So, more or less the feedback that was given to me, I found it useless because I was not given second chance to improve it. I feel that feedbacks are effective only when we are given a chance to do it again. Like some of our friends said, when they

> give us draft and we have to do it again, and then the feedback given on that draft is very effective. We can improve based on the feedback to submit it back. (…) So, taking that negative feedback was just taking a useless thing which in fact makes my life miserable. (FG 1)

Error Correction

Analysis of the students' assignment showed lecturers using a strategy which was termed error correction, Error correction included crossing out the unnecessary words or phrases, inserting a missing word, writing the correct word from the erroneous form or writing the correct answer.

The document analysis and interviews highlighted the lecturers' use of error correction and showed some differences in practice between the lecturers. For example, some minor assignments had corrections in every sentence that required improvement. However, in the interviews, most of the lecturers perceived that they provided students with the opportunity to correct their errors instead of correcting it (L4, L1). Further, a few lecturers declared that they corrected only minor errors (L2, L9, and L10). In the document analysis, error correction was not seen in major assignments or when the error was repeated throughout the given assignment. A lecturer pointed out that error correction is used to indirectly inform the student(s) that the answer students have written is not correct and the correct answer is as written by the lecturer (L7).

In the focus group interview, the majority of students stated that they were not provided with the opportunities to correct their errors by themselves rather the lecturers corrected their work for them which contradicts some of the perceptions of the lecturers reported by the lecturers above. Students perceived that error corrections done by the lecturers did not help the students to improve their learning (FG 5, FG 2). There were divided opinions among students about lecturers carrying out error correction; some found it rude on the lecturers' part to carry out error correction (FG 2) whereas some thought the lecturers should carry out error correction (FG 6).

Analysis of the assignment showed that lecturers did do extensive error correction. There was little if any evidence of students getting an opportunity to make corrections to the errors pointed out by the lecturers and subsequent changing of the marks.

Feedback Famine

Feedback Famine is a vacuum that occurs when students do not receive information about the quality of their work in their assignments. If the feedback given is specific and timely, it may help students to understand whether their work is done well, and in which areas they need to make an improvement. In the classroom observation of teaching and learning, only a few lecturers provided feedback in the form of asking questions, clarifying doubts, and exchanging ideas with the students. In most cases, it was absent.

> There wasn't much exchange of feedback, though some clarifications were made. The tutor just gave suggestions (Classroom observation 1).

> Lesson was focused more on teacher input, no activity for the students, so no feedback (Classroom observation 2).

During the interview, lecturers perceived things differently and pointed out that oral feedback was provided in the class.

> Yes, I do provide feedback in the students' write up and practical classes. I also carry out assessment on a continual basis. I believe that providing feedback helps in achieving the learning outcomes (L1).

> Mostly oral feedback is provided in my classes. I also give positive and negative reinforcement (L3).

Similar views were shared by other lecturers. However, a lecturer pointed out that in the process of teaching there were times when feedback was absent.

> Usually, in the process of teaching, I forget to provide feedback (L7).

Analysis of the written assignments, especially for the major assignments, there was evidence of feedback famine. Except for few written comments at the beginning and end of the assignments, many pages in the major assignment had no comments and only some pages had a few ticks. In the interviews, some students agreed and said that feedback was hardly given.

> We have submitted reflections almost every semester but at the end, we only get the marks (FG 3).

> There are times when assignments are without any comments. Maybe due to time factor or maybe he/she is simply lazy (FG 5).

However, the student did remark there was more feedback provided by lecturers in the microteaching session in Teaching Skills module,

> As of now in this college, the area in which we get the maximum feedback is for the microteaching we do for Teaching Skills module. We get feedback during the pre and post conferences and it is useful (FG 3).

This was supported by the classroom observation of microteaching in session where the exchange of feedback was found to be quite high.
Detailed feedback was given on every student's microteaching (Classroom observation 3).

Time, Opportunity, and Clarity

In addition to the five themes analyzed above, the data suggested other themes such as feedback missing clarity, timeliness of feedback, and the opportunity not being provided to improve on the assignment based on feedback received.

In terms of timeliness of feedback, although RUB's academic regulations recommend a three week turnaround time (The Wheel of Academic Law, RUB, 2017) for assignments, project reports etc. most of the students shared that their corrected assignments were returned late by the lecturers usually towards the end of the semester (FG 1, FG 3). This timeline didn't give students the opportunity to improve the work based on the feedback (FG 2). Lecturers expressed that it was difficult to give timely feedback because of huge class size, heavy teaching load (L1, L2, L5, L6, L7, L8) and other activities they are involved in like Programme Leadership, Research Convention, research study, and many other activities (L1, L5, L6).

Regarding clarity and usefulness of the feedback, students shared that the first and the last pages contain some written comments, but many pages hardly have any feedback. The use of a tick mark across the page gives an opportunity for students to question the validity of the assessment.

Focus group students expressed that when feedback was given, there were times when the feedback usually lacked clarity and direction on how to improve. For instance, one student commented that the only feedback received in the assignment was the word 'redo' (FG 6). The student was not sure whether the whole assignment had to be rewritten or only a section.

> In most cases, the feedback is with a comment "re-do". We would like our tutors to give us some direction so that we know what is expected of us (FG 6).

An observation made in all the written assignments was that the written feedback was accompanied by the grade. It was not clear whether it was supposed to be formative assessment or summative assessment.

Conclusion

Effective feedback is such that it enhances students' learning and brings about changes in one's own instructional design (Hattie & Timperley, 2007). The data revealed students receiving some form of feedback from their lecturers and in practice, varieties of feedback are used: generic feedback, positive feedback, negative feedback, and error correction. Out of these, the most dominant use was generic feedback and negative feedback. The findings indicated several concerns regarding feedback: feedback famine, delayed feedback, large class size, lecturers' involvement in other activities besides teaching, negative feedback that inflicted pain or is of the punishing nature and not providing an opportunity for students to improve the work based on feedback.

In providing generic feedback, there seemed to be a gap in communication between the lecturers and students. In most cases, the students did not understand the meaning of the symbols used as they were not informed about the meaning of the symbols.

However, there were differences in how lecturers perceived the issue of generic feedback from their students. For example, the findings showed that the lecturers felt that students were mature enough to understand the symbols used, or that they should be responsible enough to clarify from the lecturers. In reality, students hardly made the effort to clarify the meaning of the symbols from the lecturers since the assignments were already graded and the students perceived that there was no purpose in clarifying. This creates a gap in the intention of the lecturers and the outcome in the way the students perceive the feedback, thereby defeating the purpose of giving feedback. Sadler has pointed out that feedback doesn't serve the purpose if appropriate action is not undertaken by learners to close the gap between what one already knows and what one wants to learn (1989)

The findings show that the benefit of positive feedback was clear to both the lecturers and students. However, the findings showed minimal use in current practice and, when present, it is mostly evaluative in nature. Lecturers are hesitant in providing positive feedback as in most cases assignments are either copied from better-performing students or from the internet. Such practices point to a systemic flaw in assignment questions being repetitive or corrective measures not being in place to restrain unprofessional conduct by the students.

The study showed that negative feedback on written assignments from the lecturers is very prevalent in the College. The common understanding between the students and the lecturers is that the negative feedback can be constructive in nature, and is intended to bring improvement in students' learning. However, students reported many instances where negative feedback was not constructive in nature, but rather inflicted pain and posed a threat to student's self-esteem. Over time, this might have a negative impact on students' motivation and learning (Walsh & Sattes, 2005).

Error correction by lecturers is evident from students' written assignments as well as interview transcripts. Almost all the lecturers seemed unaware of the impact of error correction on students' learning. This led to lecturers spending a good amount of time in correcting students work and writing the correct answer. The students on their part feel that lecturers should point the error and let the students make error correction so that the purpose of giving assignments (i.e., improving students' learning) is not defeated.

In the classroom observations, teaching and learning techniques seemed to be more inclined towards teacher-centred strategies with minimal opportunity for lecturers to provide feedback to students. In the written assignments, especially in major assignments involving multiple pages, feedback famine is present. The findings reported that writing comments in the first and the last pages while the other pages simply contained a tick mark across the

page, gives an opportunity for students to question the validity of the assessment. It seems as if the marking in the assignment is provided to the students as proof that the task set has been carried out. The marks reflected in these assignments are questionable even though the lecturers may have gone through the assignment.

Though the College and the University has a mandate for assignment turnaround time of maximum three working weeks (refer University Wheel of Academic Law, 2017), in practice there are lapses. The late return of assignments means that the feedback is also received late by the students, which doesn't give the students the opportunity to improve their work. Large class sizes, heavy teaching loads, and lecturers' involvement in other non-teaching tasks are often identified as a hindrance to giving feedback on time and giving quality written feedback.

There are indications from written assignments that lecturers use summative and formative assessment simultaneously. A research study has shown that when feedback is accompanied by grading, the purpose of feedback is defeated as students are found to pay minimal or no attention to it (Butler, 1988). Hence, lecturers seem to be not clear on when to provide feedback and when not for students' work.

Recommendation

For feedback to serve its purpose in educational settings, it requires one to understand its multifaceted approach. As such, the study recommends various approaches that would be beneficial to individual lecturers and the College at large. The recommendations are as follows:

a. Knowledge of the nature of the feedback and its implications on students' learning is weak among the lecturers. A professional development or short training on feedback practice is recommended.
b. The current teaching/learning approach is inclined more towards teacher-centeredness. A blend of student-centred and teacher-centred teaching-learning approach is recommended.
c. Major assignments are challenging for the lecturers to read and provide feedback on, especially if the student numbers are high. The recommendation is to have more minor quality assignments that are reflective in nature and interactive. It is also recommended that assignment turnaround time as per RUB mandate has to be implemented seriously.
d. The lecturers' workload due to large student number and lack of time was pointed out to be hindering the feedback process; a study may be carried out to validate the argument and plan for the way forward.
e. Plagiarism seems to in practice. The College needs to implement strategies to curb such practices.

Overall, the findings of this study undoubtedly emphasises the significance of shared understandings between lecturers and students of the conventions/symbols for feedback to promote student learning.

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About the Authors

Karma Utha has a PhD in formative assessment from Aalborg University, Denmark, and M. Sc in Physics from Pune University, India. Presently, she is the Dean of Academic Affairs. She teaches Physics and professional modules in M. Ed, PgDE and B. Ed.
Corresponding author's email: kutha.sce@rub.edu.bt

R**an Singh Tamang** has M.Sc in Zoology from Madras University, India. He is the Programme Leader of School Science Laboratory Management. He teaches Biology and professional modules in M. Ed, PgDE and B. Ed.

Ngawang Namgyel has M.Sc in Mathematics from Lovely University, India. He teaches Math and professional modules in M. Ed and B. Ed.

Sonam Gyeltshen has M. A in Buddhist Philosophy from Tango Buddhist Institute, Thimphu, Bhutan. He teaches Dzongkha in B. Ed.

Dechen Doma has M. A in Counselling from Curtin University, Australia. She teaches Counselling in MACCP and PgDCCP. She is the Centre Head of Contemplative Counselling Psychology.

Wangmo has M. Ed in English from Edith Cowin University, Perth, Australia. She teaches English and professional modules in PgDE, PgDHE/PgCHE and B. Ed.

Biosorption of Pb ions with rice straw: Kinetics and Characterization study

Ram Chandra Bajgai[1], Mohammad Jawed[2], Rajneesh Kumar[3]

Abstract

Biosorption is an economic and eco-friendly method of removing heavy metal pollutants from the environment. This study investigated the adsorption kinetics, adsorption mechanism and characterization of cheaply available Khamtirice straw for biosorption of lead ions from aqueous solution. Adsorption experiments were conducted with a gram of 500 µm particle size rice straw with initial lead ion concentration 5, 10 and 15 mg/L.

The experiements revealed the rate of adsorption is highest in the initial 5 minutes and that adsorption rate decreases with increase in adsorbent dose and adsorbate volume. The maximum adsorption of Pb ions was demonstrated as 48%, 66% and 68% for 5, 10 and 15 mg/L initial Pb ion concentration, respectively. The pattern of experimental data obtained strongly indicated that adsorption of Pb ions on RS follows Pseudo-second order kinetic model.

Characterization study was done with Fourier Transform Infrared Radiation (FTIR), Field Emission Scanning Electron Microscopy (FESEM) and Energy Dispersive X-ray Spectroscopy (EDX) methods. The major functional groups involved in the adsorption are attributed to carboxyl and hydroxyl groups. FESEM image of Pb loaded RS demonstrated the inflation of nascent pores as a result of adsorption.

Keywords: *lead, rice straw (Khamti), adsorption, kinetics, nascent pores.*

Biosorption is defined as the property of certain biomolecules of biomass to bind and gather selected ions or other molecules from aqueous solutions (Volesky, 2007). The validity of biosorption process of heavy metal ions from the aqueous solution by a diverse biomaterial is adequately well-known (Saeed, Iqbal, & Akhtar, 2005). In recent decades this particular technique has gained huge popularity for the bioremediation of toxic chemicals and heavy metals. According to Xuan, Tang, Li, Liu, &Luo (2006) biosorption uses dead biomass for the removal of heavy metals (2006). The biosorption process involves different quantitative and qualitative mechanisms that vary with the type, origin and processing of biomass. Metal sequestration may entail complex mechanisms, mainly ion exchange, chelation, adsorption by physical forces and trap ion in intra and inter-molecular spaces of cell wall's structural polysaccharide network (Volesky & Holan, 1995).

Lead is used as one of the raw materials for battery manufacturing, printing, pigments, fuels, photographic materials and explosive manufacturing (Mohan & Sreelakshmi, 2008). The wastewater of electroplating factories and printed circuit board factories are usually low pH and contain high concentrations of heavy metals including lead (Lo, Chua, Lam, & Bi, 1999). It being the member of "big three" of toxic heavy metal, lead is one of the most harmful heavy metals to the ecosystem and human beings (Lo et al., 1999; Southichak, Nakano, Nomura, Chiba, & Nishimura, 2006). Its presence even in very low concentration in drinking water may cause disorders like anemia, encephalopathy, hepatitis and nephritic syndrome in human (Deng, Su, Su, Wang, & Zhu, 2006). The other suspected health hazards of leadinclude it being carcinogen, loss of appetite, muscle and joint pains, diminish IQ, abet sterility, kidney diseases

[1] School of Life Sciences, Sherubtse College, Kanglung-Royal University of Bhutan.
[2] Department of Civil Engineering. Indian Institute of Technology Guwahati, Guwahati, 781039, Assam, India.
[3] Centre for the Environment, Indian Institute of Technology Guwahati, Guwahati, 781039, Assam, India.

and high blood pressure (Sud, Mahajan, & Kaur, 2008), and physiological and neurological disorder. The permissible limit of lead in drinking water is 5µg/L.

On the thrust of the ever-increasing release of heavy metal ions in the environment, the technique of biosorption and bioremediation has come as a cheap (Arslanoglu, Soner Altundogan, & Tumen, 2008) and relatively easy to use alternative to conventional methods of heavy metal remediation from the environment (Bajgai, Georgieva, & Lazarova, 2012; Volesky & Holan, 1995). Various biomass sources are scrutinized for their potential to sequester potentially perilous heavy metal ions from the aqueous solution both in and ex-situ by the scholars (Crawford & Crawford, 2005; Gadd, 2001). Biosorption of lead ions from aqueous state has been studied with black gram husk (Saeed et al., 2005), orange peel (Xuan et al., 2006), pomegranate peel (El-Ashtoukhy, Amin, & Abdelwahab, 2008), mango peel (Iqbal, Saeed, & Zafar, 2009), lemon (Arslanoglu et al., 2008), Neem and Neem leaf (Athar, Farooq, & Hussain, 2007; Bhattacharyya & Sharma, 2004), rice husk (Mohan & Sreelakshmi, 2008), coconut fiber(Igwe, Abia, & Ibeh, 2008), tea waste (Amarasinghe & Williams, 2007), chaff in fixed bed column (Han et al., 2006), biomass of marine algae (Jalali, Ghafourian, Asef, Davarpanah, & Sepehr, 2002; Karthikeyan, Balasubramanian, & Iyer, 2007; Leusch, Holan, & Volesky, 1995; Matheickal & Yu, 1999; Sheng, Ting, Chen, & Hong, 2004), fungi (Akinkunmi, Husaini, Zulkharnain, Guan, & Roslan, 2015 ; Wang & Chen, 2009) and bacteria (Chatterjee, Mukherjee, Sarkar, & Roy, 2012; Wang & Chen, 2009).

Therefore, the present study aims to study the biosorption potential of Khamtirice straw for removing lead ions from the aqueous solution through evaluation of adsorption experiment in batch for 5, 10 and 15 mg/L lead nitrate influent concentration. Since rice straw is easily and cheaply available in large quantities, it could be used as potential biosorbent for heavy metals. The chemical composition of rice straw as reported are moisture (6.9%), hemicellulose (25.6%), cellulose (33.9%), klason lignin (10.2%), acid insoluble ash (7.8) and total ash (11.8%) (Jin & Chen, 2007).

Materials and methods

Material preparation

Rice Straw (RS) (local variety's vernacular name-Khamti) was collected from Tshangchutham village, SamdrupJongkhar district, Bhutan. RS was prepared and used as per the procedure described by Sarma et al. (Sarma, Kumar, & Pakshirajan, 2015).

Chemicals

1.6 grams of 99.9 % pure, analytical grade lead nitrate [$Pb(NO_3)_2$] dried at 100°C for 12 hours followed by instant drying in desiccators was dissolved in five ml of 0.005N HNO_3 in 1000ml volumetric flask; the volume adjusted up to the mark to get 1000 mg/L with distilled water. Freshly prepared 1000 mg/L stock solution stored in airtight bottle was used for preparing the required working concentration solutions for performing adsorption experiments.

Adsorption experiments

The potential of RS to adsorb Pb ions was evaluated through kinetic adsorption experiments in batch style (Ahamad & Jawed, 2010; Puranik & Paknikar, 1999; Reddad, Gerente, Andres, & Le Cloirec, 2002; Sarma et al., 2015).The adsorption experiments were performed in 200 ml Erlenmeyer flasks. 50 ml of 5mg/L solution of lead nitrate (adsorbate) prepared from 1000 mg/L stock solution was taken in 10 Erlenmeyer flasks designated as 5, 10, 15, 20, 25, 30, 45, 60, 90 and 120 minutes. The initial pH of the adsorbate solution was adjusted to 4 by adding a few drops of 0.15M hydrochloric acid. One gram of powdered RS (particle size >500 µm) was added as an adsorbent of lead ions and the flasks were covered to avoid aeration. Then the set up were mounted in shaking incubator (Jeotech- SI-300R, Korea) at 180 rpm and 30°C. At

the end of the designated time interval, the flasks were taken out and the adsorbent-adsorbate mixture was separated by filtration using Whatman filter paper (11 µm pore size) immediately. To ensure that whatman paper itself doesn't absorb Pb ions during filtration, whatman paper was pretreated with the respective adsorbate solution. The filtrate was analysed for lead ions in Atomic Absorption Spectrometer (Varian Australia Pty. Ltd- AA 240, Australia). The procedure was repeated with initial adsorbate concentration of 5 mg/L, 10 mg/L and 15mg/L. The entire procedures for all initial adsorbate concentration were repeated and anaverage of the 2 independent experiments was used for the determination of rate constant, rate of adsorption, adsorption capacity, interpretation and inference. The term 'rate of adsorption' is clearly defined by and Dickinson(Swearingen & Dickinson, 1932) (1932). The amount of Pb adsorption (adsorption capacity of one gram of RS) and adsorption percentage were determined as (Ahamad & Jawed, 2010):

$$q_t = \frac{(c_o - c_t)}{w} V \quad (1)$$

$$(\%) = \frac{C_0 - C_t}{C_0} \times 100 \quad (2)$$

where $q_t$is the amount of Pb adsorbed (mg/g) at time t, C_o and $C_t$are initial and final concentration (mg/L) of adsorbate at time t, V is the volume of adsorbate (L) and W is the weight of the adsorbent RS (g).

The adsorption data were fitted on pseudo first-order kinetic, pseudo second-order kinetic models and intraparticle model to study the mechanism of adsorption. The first pseudo-order rate equation with regard to adsorption on asolid surface is represented as (Ahamad & Jawed, 2010):

$$q_t = q_e(1 - e^{-k_1 t}) \quad (3)$$

and its linearized form as

$$\log(q_e - q_t) = \log q_e - \frac{k_1}{2.303} t \quad (4)$$

Where q_e and q_t are amounts of metal ions adsorbed on the adsorbent (mg/g) at equilibrium and time t respectively andk_1 is first order adsorption (min^1). The integrated form of pseudo-second-order kinetic model (Ahamad & Jawed, 2010) equation is:

$$q_t = \frac{k_2 q_e^{\,2} t}{1 + k_2 q_e t} \quad (5)$$

and the linearized form of pseudo-second-order kinetic equation on which adsorption data tested was as below:

$$\frac{t}{q_t} = \frac{1}{k_2 q_e^{\,2}} + \frac{t}{q_e} \quad (6)$$

Where q_e and q_t are amounts of metal ions adsorbed on the adsorbent (mg/g) at equilibrium and time t respectively and k_2 is the second order adsorption rate constant (mg/min^1). The possibility of Pb ions transport from the solution to the pores of RS will be tested using thegraphical relationship between theamount of Pb adsorbed (q_t) versus square root of time (t) as per the equation (7):

$$q_t = k_p \sqrt{t} \quad (7)$$

wherek_p is the intraparticle diffusion rate constant mg/g min$^{0.5}$)

Characterization of RS

Characterization study of the Lead-RS complex formed due to the adsorption was done by Fourier Transform Infrared Radiation (FTIR) spectroscopy, Field Emission Scanning Electron Microscopy (FESEM) and Energy Dispersive X-Ray Spectroscopy (EDX). For FTIR, the metal loaded RS obtained from the adsorption experiment was oven dried at 60 °C overnight. The native and metal loaded KBr-RS translucent film prepared following the procedures described by Sarma et al. (Sarma et al., 2015) was analysed using FTIR spectroscope (PerkinElmer, Spectrum Two, Singapore).Similarly, for FESEM analysis, the metal loaded RS obtained from the adsorption experiment (10 mg/L initial concentration) was oven dried at 60 °C overnight, and crushed to powder the clumps. The native and metal loaded RS were analysed for morphology and lead adsorption site in the molecules of RS particles using FESEM-EDX (Zeiss, Sigma, Germany).

Result and Discussion

Adsorption of Pb ions

As can be observed from the experimental results (Fig. 1), that adsorption equilibriums were established in 60 minutes in 5 mg/L, in 45 minutes for 10 mg/L and in 25 minutes with15 mg/L initial adsorbate concentrations. Time taken to reach equilibrium adsorption is dependent on the initial adsorbate concentration; higher the initial adsorbate concentration, lesser the time required for achieving the equilibrium adsorption with adsorbate volume and adsorbent dose remaining constant. The rate of adsorption is rapid in the initial 5 minutes; about 48%, 65% and 68% of adsorption occur in the first 5 minutes in 5 mg/L, 10 mg/L and 15 mg/L respectively. The rapid adsorption rate in the initial phase is attributed to abundantly available negatively charged functional groups on the RS surface. The decrease in sorption rate with time is credited to the electrostatic hindrance caused by already sorbed positively charged metal species and slow pore diffusion of Pb ions (Sarma et al., 2015). Xuan et al. (2006); Lo, Chua, Lam, & Bi (1999) and others have found the similar trend to reach the equilibrium adsorption of Pb ions with various biomaterials.

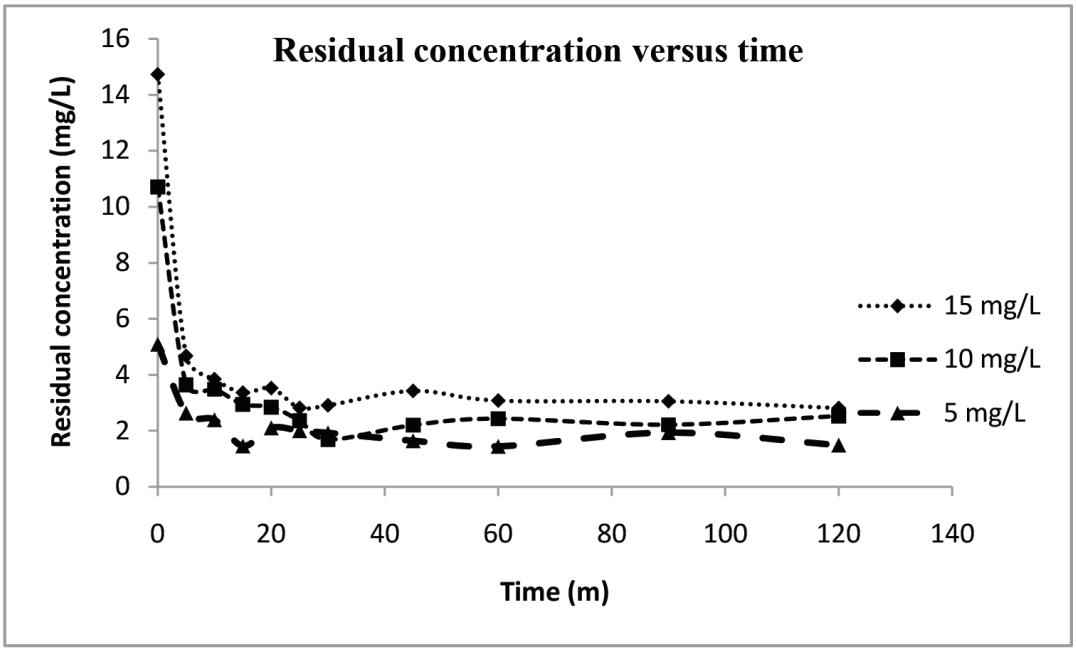

Figure 1. *Residual concentration of Pb ions in the solution after adsorption*

Adsorption kinetics

The adsorption data were tested for the pseudo-first and -second order kinetic model to explain the mechanism of adsorption. In this study, the values of $q_{e.exp}$ and k_1 were determined for experimental kinetic data using the mathematical least square method. The R^2 and $q_{e.cal}$ values for pseudo-first-order kinetic model were calculated through intercept and slope plotted between log (q_e-q_t) versus time t, where q_e (mg/g) and q_t (mg/g) are equilibrium adsorption and adsorption at time t. Calculated q_t values were calculated using Eqn. 3.Figure 2 represents graph (lines-calculated q_t, dots-experimental q_t) plotted between q_t versus time (A) first pseudo-order kinetic model. For pseudo-second-order model, values of K_2, R^2 and $q_{e.cal}$ were calculated from the slope of the graphs plotted between t/q_t versus t. Figure 2 (B) represents a graph plotted between t/q_t versus time. The estimated kinetic parameters and R^2 values for pseudo-first and second-order kinetic models are represented in Table 1.

The R^2values obtained for the pseudo-first-order model are much smaller than the R^2 values obtained for pseudo-second-order model. Second order R^2 values are nearest to the unity 1for all initial adsorbate concentration suggesting that adsorption of lead ions on RS follows thepseudo-second-order model. Further, the experimental equilibrium adsorption capacity ($q_{e.exp}$) compared with the calculated equilibrium adsorption capacity ($q_{e.cal}$), there's a significant variation between ($q_{e.exp}$) and first order ($q_{e.cal}$). The variation is 76.84%, 7.34% and 55.02% for 5, 10 and 15 mg/L initial concentration respectively; whereas in the case of ($q_{e.exp}$) and second order ($q_{e.cal}$), the variation is insignificant (>5%) in all initial concentration. Therefore, it confirms that the adsorption of lead ions on RS follows the pseudo second-order model.

Table 1. *Estimated adsorption kinetic parameters for lead removal using RS.*

Kinetic model	Pseudo first order kinetic model				Pseudo second order kinetic model			
Initial Pb (II) (mg/L)	$q_{e.exp}$ mg/g	$q_{e\cdot cal}$(mg/g)	K_1	R^2	$q_{e.exp}$ mg/g	$q_{e\cdot cal}$ (mg/g)	K_2	R^2
5	0.177	0.041	0.0115	0.301	0.177	0.176	2.7218	0.991
10	0.518	0.48	0.0161	0.592	0.518	0.493	0.6948	0.997
15	0.667	0.3	0.0276	0.844	0.667	0.669	0.6179	0.999

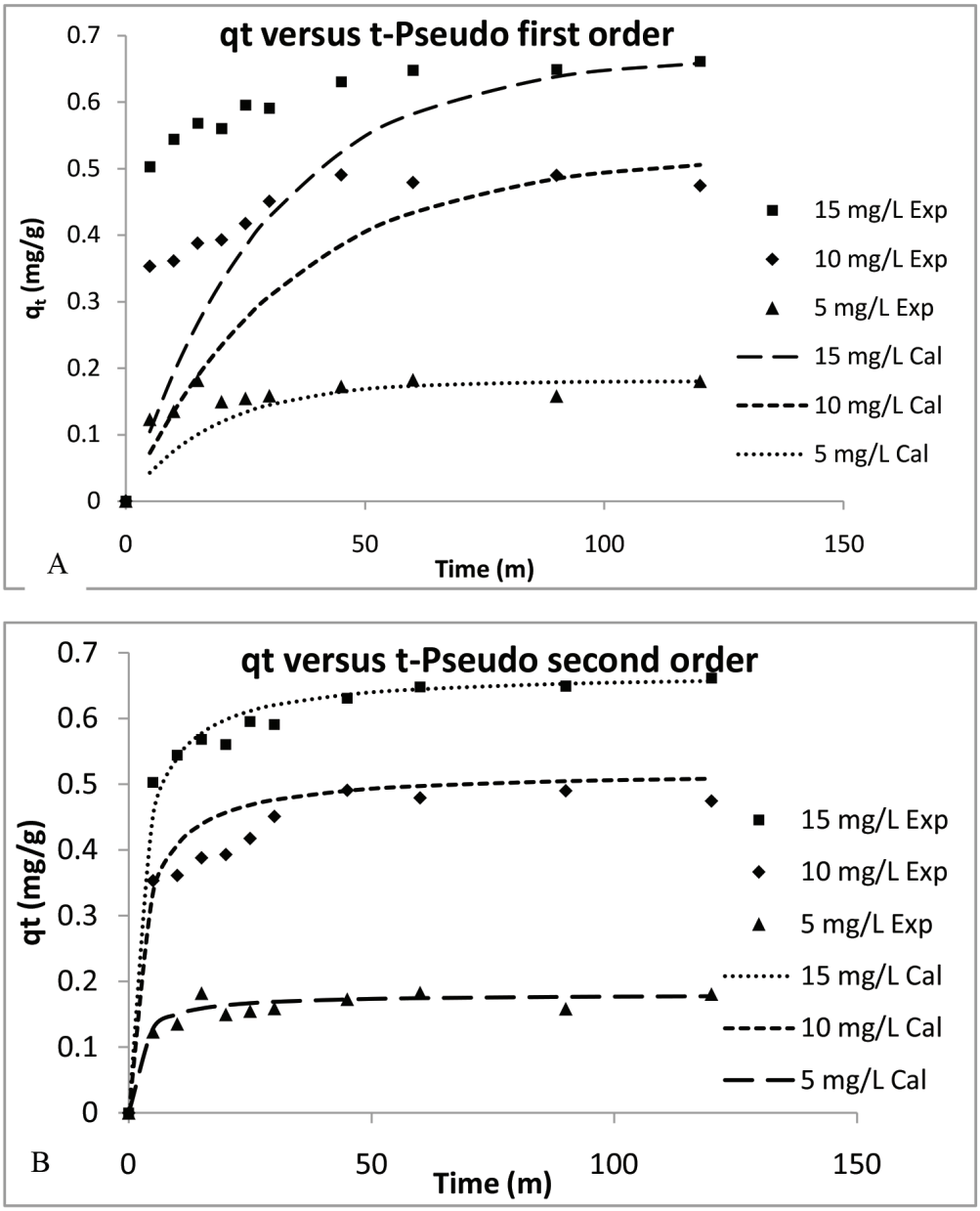

Figure 2.*Superimposition of experimental data qt.exp (dot points) over calculated qt.cal (lines); plot qt(mg/g) versus time (m), (A)-Pseudo first order, (B)-Pseudo second order.*

The experimental data was tested for the mechanism of Pb ions transport on and into the RS with the help of graphs plotted between q_t and $t^{0.5}$ (Fig. 3). According to Ahamad and Jawed (2010) as represented by 5 mg/L and 15 mg/L curves in Fig.3,ithas only the curved portion indicating that adsorption of Pb ions from the adsorbate solution to the external surface of RS mostly through boundary layers. In case of 10 mg/L initial adsorbate concentration, the curve has distinct initial curved portion followed by a straight linear portion. This indicates that in 10 mg/L initial concentration both boundary layer diffusion and pore diffusion take place. The intraparticle rate constant calculated using the slope of the straight line portion of the curve andR^2 value obtained was 0.902 and the k_p 0.007 mg/g $(min)^{0.5}$. Even though the R^2 value is slightly higher the k_p value is much lower. This suggests of very small level of intraparticle diffusion of Pb ions in RS.

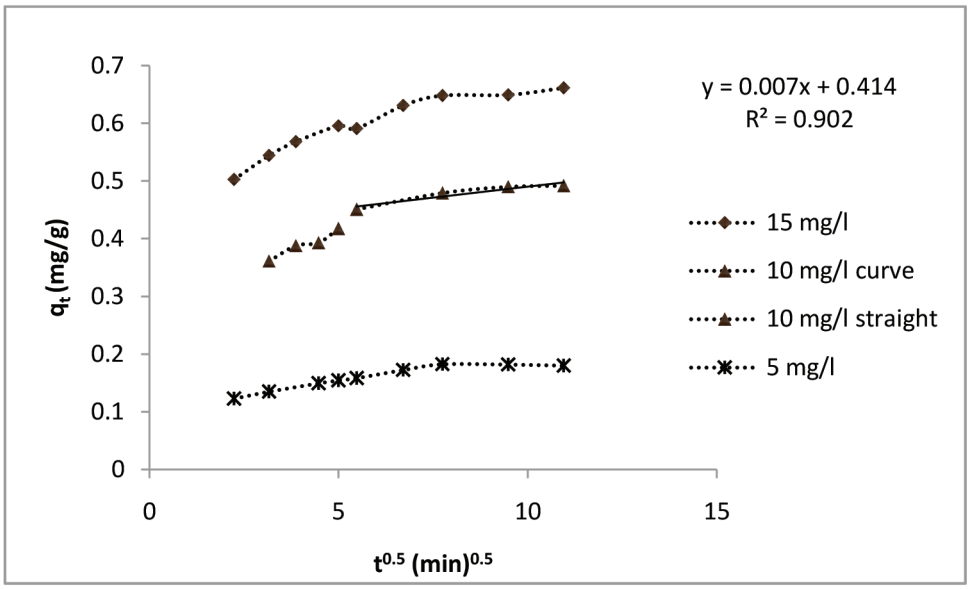

Figure 3. *Plot qt versus t0.5 (min)0.5: intraparticle diffusion model for adsorption of Pb ions on RS.*

Characterization of RS

FTIR spectrum was obtained to find the functional groups of RS involved in the adsorption of Pb ions.The main stretching of the spectrum was in the range 4000–400 cm^{-1} for both the native and Pb ion loaded RS. The spectrum obtained for native RS was distinctly characterized by the peaks at 3430 cm^{-1},1733 cm^{-1},1636 cm^{-1}, 1519 cm^{-1}, 1105 $cm^{-1}$and 901cm^{-1}.According to Iqbal et al. the broad and intense peak at 3418cm^{-1}wasrelated to the stretching of O-H group polymeric compounds like alcohols, phenols and carboxylic acids as found in pectin, cellulose and lignin of biological material(Iqbal et al., 2009). The weak peak observed at 1733cm^{-1} is the stretching vibration of C=O bond due to non-ionic carboxyl groups (–COOH, $–COOCH_3$) which may be indicated to carboxylic acids or their esters. The spectrum of native RS suggests that carboxyl and hydroxyl groups present in biopolymers may function as proton donors for the adsorption of Pb ions(Ashkenazy, Gottlieb, & Yannai, 1997). FTIR spectrum of Pb ion loaded RS had peaks shifted at 3418cm^{-1}, 1729cm^{-1}, 1623cm^{-1}, 1513cm^{-1}, 1099$cm^{-1}$and 895cm^{-1}(Fig. 5). The peaks at 1729 cm^{-1} and 1623 cm^{-1}, respectively represent C=O stretching (aliphatic ketones) of poly methyl methacrylate and amide I bands(Stuart, 2004). The change in the position of peaks in the case of Pb ion loaded RS is attributed to the adsorption of Pb ions with carboxylate and hydyroxylate functional groups.

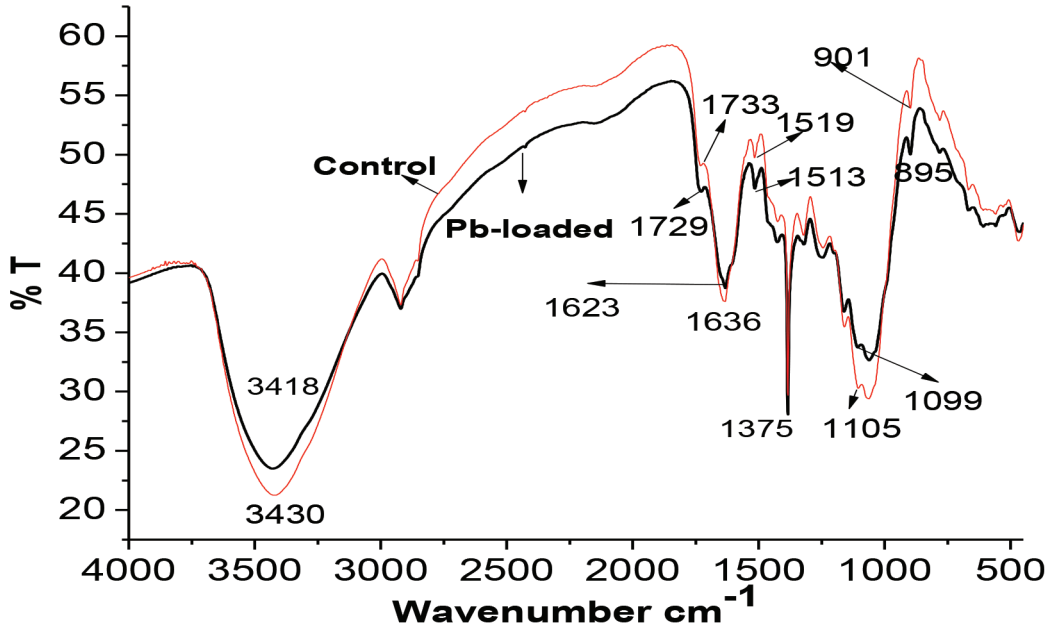

Figure 4. *FTIR spectra of control and Pb ion loaded RS.*

FESEM image reveals that the adsorption of Pb ions characterizes the surface of RS with protrusion of minute balloon-like structures as seen in Fig. 5 B. These structures remain invisible nascent pores facing the interior of RS particle on the surface in case of native RS (Fig. 5 A). Further, the adsorption of Pb ions on RS was confirmed by the elemental detection of Pb in EDX spectra which was not detected for control RS spectrum.

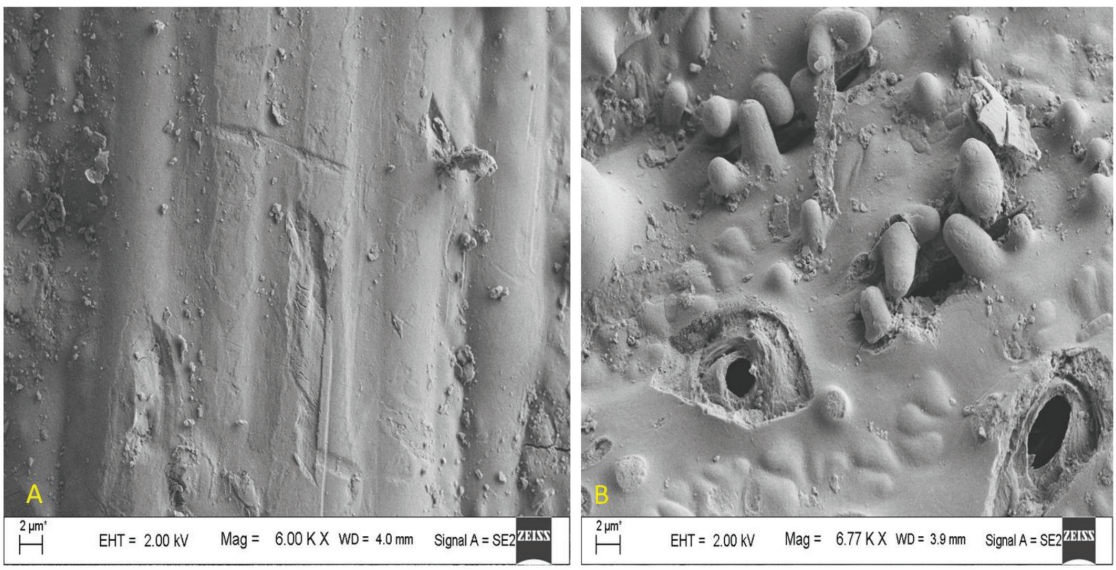

Figure 5. *FESEM image. A. Image of native RS, B. Image of Pb ion loaded RS.*

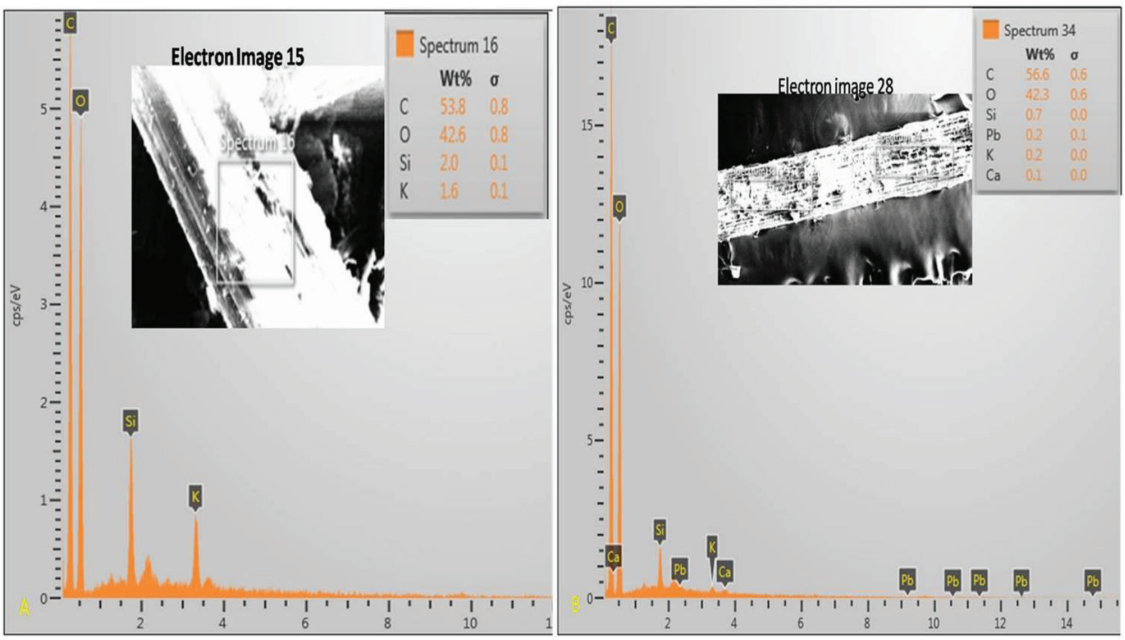

Figure 6. *A. EDX spectrum inserted with theimage of native RS, B. EDX spectrum inserted with theimage of Pb ion loaded RS.*

Conclusion

Adsorption equilibriums of Pb ion adsorption on RS are 60, 45 and 25 minutes in 5, 10 and 15 mg/L Pb ion initial concentrations, respectively. The maximum adsorption of Pb ions by a gram of RS at pH 4 was respectively demonstrated at 48%, 66% and 68% for 5, 10 and 15 mg/L initial Pb ion concentration, following the Pseudo-second order model. Adsorption mechanisms involved in the adsorption of Pb ions on RS is boundary layer diffusion and pore diffusion where the role of pore diffusion is being minimal or null. The major functional groups involved in adsorption of Pb ions are attributed to carboxyl and hydroxyl groups. The mechanism (Pakshirajan, Worku, Acheampong, Lubberding, & Lens, 2013; Sarma et al., 2015) and trend of adsorption (Ahamad & Jawed, 2010; Bhattacharyya & Sharma, 2004) of this particular experiment are found to be in comparison with the result in the published literature. Therefore, the cheaply available Khamti rice straw could be a potential biosorbent of Pb ions from wastewater.

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About the Authors

Ram Chandra Bajgai, a lecturer in Botany at the Royal University of Bhutan, Sherubtse College, holds masters of Biotechnology from the University of Chemical Technology and Metallurgy (UCTM), Sofia, Bulgaria, Bachelor of Science in Botany (majors) from the University of Kerala, Trivandrum, India and Post Graduate Diploma in Education (PgDE) from Samtse College of Education, Royal University of Bhutan. He is among the first batch of PgDE recipient. His research interests include Non-Timber Forest Product (NTFP) with special interest in Wild Edible Plants (WEP), Ecology & Food Security and Environmental Bioremediation.

Dr Mohammad Jawed is a Professor of Environmental Engineering at the Department of civil engineering, Indian Institute of Technology Guwahati (IITG). He holds PhD and Masters in environmental engineering from Indian Institute of Technology Kanpur (IITK) and B ScEngg in civil engineering from Aligarh Muslim University. His research interest includes Biological Processes; Anaerobic Wastewater Treatment, Heavy Metal Removal and Recovery from Aqueous Environment, Domestic and Industrial Wastewater Treatment, Water Treatment and Supply and Household Water Treatment Units for Rural Areas.

Rajneesh Kumar is a PhD scholar at the Center for the Environment, Indian Institute of Technology Guwahati (IITG). He holds M. Tech. in Environmental Engineering from National Institute of Foundry & Forage Technology (NIFFT), Ranghi, Bihar and B. Tech. in Biotechnology from Harcourt Butler Technological Institution (HBTI) Kanpur.

Cloze as a measure of specialist language difficulties: Write-in or multiple choice?

Sonam Zangmo[1], Richard Laugesen[2], John Mitchell O'Toole[3] and Kuenzang Gyeltshen[4]

Abstract

This paper reports a quantitative study of 180 Bhutanese Year 10 secondary school students' responses to 'write-in' and 'multiple-choice' format Cloze tests based on the same Biology passage from a Year 9 science textbook. The study sought to better understand the impact of moving from manual coding to machine scoring of Cloze responses.

Findings reveal the following:

a. The overall difference in student scores on the two tests was not statistically significant.
b. Both tests suggest similar patterns of student difficulty.
c. This group of students appeared to have trouble with: identifying the topics within a particular piece of science writing, the way that the ideas within it were connected and the manner in which things described within it were done.

This study is significant because web-based Cloze generators are becoming more widely available and teachers who are considering their use would benefit from an understanding of the relationship between these two forms of a commonly used language test.

Keywords: *Cloze, comprehensibility, readability, test format*

Reading is a complex interaction between text and reader (Klare, 1988) that is crucial for improving student understanding of science (Reeves, 2005). The ease with which students access information in textbooks has long been discussed under the label of readability (Binkley, 1988; Kerr, 1972; Long, 1991; Macinnis, 1979).

Readability is often estimated impressionistically. This can be very accurate if the estimator is highly expert and very familiar with those who will try to read. Questions about either expertise or familiarity lead to the use of numerical estimates of readability. One of a variety of readability formulae may be applied or a sample passage from the suggested resource may form the basis of a'Cloze' test that is presented to the target group.

Cloze tests have been used to estimate the difficulty that people might have in reading particular written text since the 1950s. The technique has attracted considerable controversy (Brown 2013) but it remains popular with literacy teachers both because of its apparent simplicity and of the ease with which particular texts can be challenged by specific learner populations.

Construction of Cloze tests involves deletion of words to produce gaps in a text, which readers are invited to fill. A random word is most usually deleted from the second sentence of a passage, followed by deletion of every fifth (or seventh, ninth, eleventh or thirteenth) word thereafter until the desired number of words (usually 50) has been deleted (Gunning, 2002; Hughes, 1989; Lapp, Flood, & Farnan, 1989; Gellert & Elbro 2013). A particular group of readers then tries to replace the deleted words and the group average of correct responses is interpreted as an estimate of the access the specific group would have to the meaning of the particular text.

[1] Samtse Secondary School, Bhutan
[2] Tinyrock, Canberra, ACT, Australia
[3] School of Education University of Newcastle, Australia
[4] Samtse College of Education, Bhutan

The use of Cloze techniques has been extended beyond such holistic estimations of English text readability to the identification of particular difficulties that provide an illuminative lens on reader problems with specific language styles (O'Toole, Cheng & O'Toole 2015). If deletions are grouped into language feature categories, reader errors in attempting to replace the deletions suggest patterns of difficulty with those language features.

There has been considerable debate over the relative merits of strict and conceptual coding of student responses (O'Toole & King 2011). Strict coding accepts only the exact word that was deleted, while conceptual coding counts words that maintain the meaning of the passage as also correct. Manual coding of Cloze tests is tedious and can introduce substantial coder error, particularly if entries are coded conceptually. One relatively common alternative is to transform the 'write-in' gaps on paper-based Cloze tests into 'multiple choice' items on a web-based platform. The earlier, manually coded, 'write-in' format has been the subject of considerable research, which has produced a range of suggested 'criterion scores' for levels of suggested text difficulty (Oller & Jonz 1994). It would be useful for researchers and teachers who use the Cloze techniques to recognise similarities between the results of the 'write-in' and multiple-choice formats and identify any potential differences between them.

Research Questions

The present investigation was intended to contribute to better understanding of the impact of moving from the manual coding of Cloze responses to machine scoring.

The research questions guiding this study were:

1. Do 'write-in' and multiple choice Cloze tests based on the same passage generate different mean scores when completed by the same group?
2. Do 'write-in' and multiple choice Cloze tests suggest similar patterns of difficulty when completed by the same group?
3. Do the patterns of student difficulty suggested by Cloze test results indicate fruitful directions for subsequent teacher work?

Methodology

This is a quantitative study of the relationship between student responses to Cloze items based on the same passage dealing with the human body's defences against infection (Heffernan & Learmonth, 2001 pp. 211, 213). The same group of Year 10 students completed two tests: a paper-based 'write-in' version where they filled the gaps left in a passage by regular deletion of one word in five and a web-based multiple-choice version where they chose the most correct word to fill the gap from an array of five alternatives.

The open nature of the 'write-in' test makes it potentially more difficult than the multiple-choice test, where the correct answer is visible to the student. However, the multiple-choice distracters used in this study represented the most common clear errors from a large, highly reliable previous study (O'Toole 1998). The mean conceptual total is consequently a more valid basis for comparison with the multiple choice score than the mean exact total.

Participating students completed the 'write-in' test four months before they attempted the web-based multiple-choice test based on the same passage. The results of the two tests were analysed separately and then compared.

Tests

The paper, 'write-in' test had been used in a number of previous studies (including O'Toole & O'Toole 2004; O'Toole, Cheng & O'Toole 2015). This test achieved a level of reliability that is sufficient to permit discussion (O'Toole 1998: Cronbach's = 0.94, n=807; Present investigation: = 0.84, n=180).

Conceptual coding allowed the identification of 'clear errors', entries that represented

neither exact nor conceptual replacement. Items representing particular language features were grouped into categories based on shallow dictionary categories and on deeper functional categories that had the potential to explain both differences between items and their impact on student understanding (O'Toole & Laugesen 2011). Patterns of clear error on these categories were used to reveal patterns of student difficulty on 'language feature sub-tests'. The comparison at the core of this investigation was based on the clear error scores of the students on the 'write-in'Cloze test. Data from sub-tests that are either composed of less than five items or which yielded a reliability statistic less than 0.5 were discarded.

A web-based multiple-choice test was prepared on the basis of the same passage as existing research. The correct answer was the actual word deleted to form the Cloze item (exact replacement) and the distracters for the items were provided by the most common errors that the 1998 study revealed for each gap (clear error). The web-based package defines a 'difficult' item as one that was correctly completed by less than half of the class and the same criterion was used for the 'write-in' results in the present investigation.

Student Sample

The student sample consisted of Year 10 students studying science in Bhutan. There were 190 students in that cohort in the participating High School but the sample dropped to 180 students when incomplete and otherwise corrupted results were removed. The analysed sample consisted of 82 males and 98 females, all of whom were born in Bhutan; 38 students identified as speaking the national language at home (Dzongkha), the remainder indicated that they spoke a regional variety. Although the topic of the passage on which both forms of the Cloze test were based might be expected to form part of student background knowledge, student responses indicated that these classes had not formally studied it. The passage itself was written for English background students one year younger than the students in this sample. The text appears valid for use with this student sample.

Results

The two Cloze tests were taken four months apart. Use of R (Maindonald and Braun 2003) to carry out the Welch Two Sample t-test suggested that the apparent difference between the means of the distributions of the two sets of results of this single group of students falls short of statistical significance (see Table 1).

Table 1 - *Are the two Cloze tests based on the same passage substantially equivalent?*

Test format	**Mean % *correct***	**Difference**	**t**	**df**	**p-value**
Write-in	45.60 ***Conceptual Total***	3.60	-1.92	358	0.06
Multiple-choice	42.00				

The use of conceptually correct coding from the 'write-in' version allows preliminary comparison of the 'difficult' items (clear errors) identified from student attempts to complete each form of the test. 'Difficulty' was defined as greater than 50% of the group being unable to correctly replace the words deleted for a category ('Mean % wrong') when the particular sub-test yielded a reliability score over 0.5 (Cronbach □). The data for language features identified as 'difficult' appears on Table 2.

Table 2 *Features identified as 'difficult' by both forms of the Cloze test*

Category	Number of items	Write-in		Multiple choice	
		Cronbach □	Mean % *wrong*	Cronbach □	Mean % *wrong*
Overall	50	0.839	54.40	0.832	58.00
Traditional Noun	18	0.622	49.75	0.602	63.27
Article	5	0.529	52.44	0.287	66.29
Verb	13	0.601	56.92	0.559	48.37
Preposition	5	0.527	55.00	0.248	49.39
Functional Cohesion	15	0.585	56.59	0.590	46.20

Discussion

The two tests yield statistically equivalent results with this group of 180 Year 10 students. The two tests identify similar language features as difficult for this group of students. The length of time between the two testing episodes makes any learning effect unlikely and this is supported by comparison of the mean scores for these two Cloze tests.

The actual identity of the categories identified as difficult by this preliminary analysis is of considerable interest. Bhutanese students study in English-medium schools in a Dzongkha-speaking environment. Both Cloze tests indicated that English nouns, in general, posed problems for these second-language learners, although words coded as 'technical' just fell short of the criteria established for comment (□ = 0.539 & mean % error = 43%). The words that teachers do not teach are often those causing most problems for learners. The difficulty these students are experiencing with verbs (but apparently not Passive Voice: □ = 0.366 & mean % error = 54%) may reflect the same impact of unfounded teacher expectation of learner control of common features of their specialist style. Prepositions and articles are used in particular, and often unnoticed, ways in scientific writing and the relatively greater difficulty that these students are experiencing with them may also reflect the focus on technical features of the style with neglect of less obvious grammatical features. Student problems with recognition of the cohesive links which tie the base passage together reflect the same phenomenon.

These results rest on mean scores, indicating that around half the class is having more difficulty with these features than the figures in Table 2 indicate and suggesting that it is likely that they are having appreciable difficulty with features that did not reach the criteria for discussion in this paper. These difficulties go some distance towards explaining why this passage would cause frustration if these students attempted to read it (conceptually correct mean of 54%: less than 65% and so at 'frustration' level, according to Oller & Jonz 1994 p.6).

Conclusions

It seems clear that the 'write-in' and multiple choice Cloze tests, based on the same passage, were statistically equivalent when attempted by this group of Year 10, Bhutanese science students.

This suggests that teachers and researchers may use the more convenient multiple-choice format of the Cloze technique with confidence and that the criterion scores established by past work with the manually scored 'write-in' format may also be applied to the web-based results. Such use avoids both the threats to result in validity flowing from concerns about inter-rater reliability in the manual coding of conceptually correct entries and on-going concerns about whether conceptual or exact coding of reader replacement of Cloze deletions is more appropriate.

It should be noted that this comparison has been in terms of mean group difficulty, which

suggests that half of the class is having more difficulty than the mean suggests and that the two tests identify similar patterns of group difficulty with the language of the passage on which both Cloze tests were based. These difficulties can be fruitfully engaged through use of language focused exercises that are presented in conceptually coherent sets within the context of the class work being undertaken by the students experiencing them (O'Toole &Laugesen 2011).

Students do not need to respond with blank incomprehension to text from which they are expected to learn. This relatively small study suggests that there is a convenient, valid and reliable tool for identification of specific student difficulties with the language of their school subjects. It also suggests a potentially fruitful teacher response to those difficulties.

Limitations and further work

This paper was based on preliminary analysis of data based on an existing Cloze test. This data will repay further analysis and the use of this test will allow comparison of the difficulties experienced by these Bhutanese students with those experienced by other students at a similar stage of schooling in other places. Such data exists for Mandarin-speaking students in Singapore, Pilipino-speaking students in the Philippines and English-speaking students in Australia.

The passage from which the Cloze tests used in this study were drawn was not based on a resource being used by these Bhutanese students. The substantial match between the multiple-choice and write-in tests encourages the use of thinkliteracy.com as the vehicle for one or more tests based on a Bhutanese Year 10 Science textbook. This would allow Science teachers in Bhutan to gain a more direct indication of the specific difficulties being experienced by their particular students and to focus classroom attention upon those features causing most difficulty. That might be expected to lead to an improvement in student comprehension of their science books and consequent increase in their scientific understanding.

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About the Authors

Sonam Zangmo is the Cluster Lead Teacher at Samtse Higher Secondary School. She has M.Ed. Science from the University of Newcastle, Australia and B.Ed. Secondary (Biology & Chemistry) from National Institute of Education, Samtse, Bhutan. She has worked very closely with the Royal Education Council and developed Science and ICT textbooks. Her research interests include Science education and authentic assessment in the schools.

Dr J.M. O'Toole [PhD, Med. (Hons), BSc(Ed)] has long been involved in the preparation of resources for science teachers who have become conscious of the language component of their expectations of students at various levels of education. He is currently employed by the University of Newcastle, Australia, School of Education, with continuing responsibility for secondary science teacher preparation, post-graduate re-training and supervision of a wide range of Research Higher Degree projects. Mitch›s major research interests are in the impact of language style on science teaching, the interaction between student and teacher understandings of the history and nature of science; the environment; and information and communication technology.

Richard Laugesen is the Managing Director of Tiny Rock Pty Ltd, a supplier of innovative software and services for education. He holds a Graduate Diploma of Education, Graduate Certificate of Information Technology, and a Bachelor of Science (Physics). Richard is a senior hydrologist at the Australian Bureau of Meteorology where he leads cross-disciplinary teams to develop water forecasting systems. His research interests include coastal hydrology, runoff impacts on sensitive coastal environments, and hydrological modelling.

Kuenzang Gyeltshen is an Assistant Professor at Samtse College of Education, Royal University of Bhutan. He has a Master degree in Geography from Delhi School of Economics, University of Delhi, India. He has been a teacher educator for the last 15 years with extensive involvement in programme and curriculum development for the College. Currently, he is the Subject Leader for Geography His research interests include Environmental Geography and Higher Education.

A Preliminary PISA-D Preparation Assessment Survey under Wangdue District

Dumcho Wangdi, Shankar Lal Dahal, Sonam Tshomo, Pema Dorji

Abstract

This study was aimed to gather a baseline data of the preliminary PISA-D preparations implemented in the four PISA-D participating schools under Wangdue district. A test questionnaire that comprised of 15 items, five items each from the domains of reading, mathematics and science was used as an instrument to gather the data. The data collected were analyzed using the descriptive statistics, ANOVA and t-tests. The findings indicated that the scores of the four participating schools had a statistically significant difference [F(3, 591) =23.89, p=.000] at p=.05 with a quite small effect size (eta squared=.10). There was no significant difference in the mean score of male and females for all the schools. However, there was a statistically significant difference in the mean score of male (M=6.69; SD=2.20) and females (M=6.32; SD=2.31); t(593) =2.01, p=0.44 under Wangdue district. The magnitude of the differences between the mean scores of male and female were observed very small (eta squared =.0006). The students in general performed better in the domain of reading for all the schools.

Keywords: *PISA-D, preliminary preparation assessment survey, Wangdue district, baseline data*

The assessment of the educational reforms by international standardized assessments has increasingly gained momentum in the process of education policymaking at both national and international levels. The indicators and data obtained particularly from such international benchmarking assessments are extensively used as policy guides while targeting for any educational reforms (Sahlberg, 2011). Due to such significance, just within the last two decades, several international surveys have been institutionalized in assessing the students' knowledge and competency in various domains such as reading, mathematics, and science. One such international test is PISA. Established as a project of the Organization for Economic Cooperation and Development (OECD), PISA test is administered repeatedly after every three years (Cambridge International Examination, 2015; Goldstein, 2004; Turner & Adams, 2007; Grek, 2009). Since its launch in 2000 (Turner & Adams, 2007; Sahlberg, 2011; Lusardi, 2015), the PISA has witnessed growing number of countries joining it. This survey which was initially envisaged as a means of providing data on which to base educational policy for the OECD countries later gathered more non-OECD countries (Eivers, 2010; Bloem, 2013).

Student Assessment for Development (PISA-D) to cater the needs of the middle and low-income countries in implementing PISA framework-based assessment instruments (OECD, 2016).

Bhutan's participation in PISA-D was endorsed during the 18th National Education Conference held at Phuentsholing during winter season 2016 in the presence of the Prime Minister Tshering Tobgay (Ministry of Education, 2017). Its participation is expected to gather baseline data on 15-year-old Bhutanese students' knowledge, skills, and competencies in the three domains of reading, mathematics, and science. The relevant stakeholders engaged in improving the national education standards will be drawn closer to devise strategic plans on redefining the competency of our students to an international parity (BCSEA, 2017). With these noble perspectives, the schools located across the kingdom that caters schooling to the grade nine students were mandated to institute the PISA-D club and conduct tests as a part of their instructional schedule.

In Wangdue district, the PISA-D programmes have already been a part of the school curricula particularly for four schools, namely Bajothang Higher Secondary School, Gaselo Central School, Phobjikha Central School and Samtengang Central School. As a regular academic affair, every one hour of the Saturdays are devoted to the PISA-D club so as to coach or conduct classes for all the three domains of reading, science, and mathematics alternatively. However, this national programme mandated to be functioning smoothly in the schools often encounter some challenges such as inexperienced teachers pertaining to the conduct of PISA-D tests, inaccessibility of the test materials and relevant resources. Yet despite these resistive factors, the club, as well as the tests, are executed in these four schools while the direction and status of its progress remain unmeasured. Thus, as much as these tests are necessary, the need for an evidence-based perspective to determine the progress of this national enterprise implemented at the district level was apparent. But as evaluation needs a standard for comparison (Champagne, 2009), a preliminary PISA-D preparation survey was administered to all the grade nine students of the four participating schools under Wangdue district. Five items each from the domains of reading, mathematics, and science were used with an aim to gather a preliminary baseline data on students' preparation towards the PISA-D. The baseline data were an integral part of this survey to make a comparative study on the students' performances and competencies based on the three domains of reading, mathematics, and science. The information accumulated from this study will also assist in locating the probable factors determining the outcome of this national enterprise and thereby suggest needy interventions from the relevant authorities.

Baseline Survey Objectives

The objectives of this baseline survey were to:

i. Gather baseline data on how the grade nine students under Wangdue district perform in the preliminary PISA-D tests on reading, mathematics, and science.
ii. Examine grade nine students' competency on three domains of reading, mathematics, and science in the participating schools.
iii. Compare the mean scores of the four participating schools for the domains of reading, mathematics and science, and,
iv. Explore whether the baseline data is determined by the gender ratio in each participating schools as well as in the district.

Literature Review

Evaluating Bodies

Although there are different methods of comparing the educational performance in different countries (Sahlberg, 2011), the three most widely recognized surveys are TIMSS, PISA and PIRLS (Cambridge International Examination, 2015; Goldstein, 2004). Established in 1995, Trends in International Mathematics and Science Study (TIMSS) was the first international comparative survey run to test the learners of 10 and 14 years old in reading, mathematics, and science (Goldstein, 2004; Cambridge International Examination, 2015). It is managed by the International Association for the Evaluation of Educational Achievement (IEA) (Eivers, 2010) and is repeated after every 4 years. PISA that assessed the 15-old students' competency in reading, mathematics, and science was established in 2000. In the following year, another sister international survey was offered by the IEA to focus on 10-year-old learners' ability in reading and literacy (2001). Known as the PIRLS (Progress in International Reading Literacy Study), this test is repeated after every 5 years (Cambridge International Examination, 2015). These tests which determine the same areas of students' achievement are in fact different from one another (Sahlberg, 2011). The TIMSS examines students' knowledge of specific content

defined by the national curricula whereas the PISA measures the 'functional skills' making students capable of solving the real world situations (Eivers, 2010; Jerrim & Shure, 2016) that are essential for full participation in society (OECD, 2007).

Programme for International Student Assessment (PISA)

The Programme for International Student Assessment (PISA) is a large-scale comparative triennial survey institutionalized to evaluate education systems worldwide by testing the skills and knowledge of randomly sampled 15-year-old students (Figazzolo, 2009; Mortimore, 2009; Eivers, 2010; Kankaraš & Moors, 2014; Lusardi, 2015). At this age, students in most of the OECD countries generally complete their compulsory education[1]. In general, those students aged between 15 years 3 months and 16 years 2 months at the time of assessment are actually the target students of PISA because using this age across countries enable PISA to compare consistently despite the nature of diversity in their educational history (OECD, 2014).

After its establishment in 2000, the PISA which was first of its series concentrated on reading with some mathematics and science components as well (Goldstein, 2004). Each survey has a particular focus on one subject (Bloem, 2013) that takes nearly two-thirds of the total time administered for the test (OECD, 2014). The reading literacy was the focus of PISA 2000 and 2009, mathematics in 2003 and 2012 and scientific skills in 2006 and 2015 (Goldstein, 2004; Thomson, de Bortoli, Nicholas, Hillman, & Buckley, 2010; Bloem, 2013; OECD, 2014). The PISA 2015 was the sixth study of its kind to be conducted since its establishment, in which 72 countries including the 35 OECD member countries participated (OECD, 2014; Jerrim & Shure, 2016). The reading will be the focus for PISA 2018. The focus of PISA on these three domains of reading, mathematics, and science, was arguably due to their perceived value as economic assets and not just key competencies for the students' later societal participation (Eivers, 2010).

The questions in the PISA demand 15-year olds to demonstrate their knowledge, learning and problem-solving abilities including logical and critical thinking. It avoids the inclusion of questions that simply assess the students' basic factual recall or retrieval of the information based on the standard curriculum. In general, it emphasizes the students' ability to understand what they can do with what they actually know (Goldstein, 2004) and measure how capable they are in terms of applying their knowledge and skills in real-life situations (Thomson et al., 2010). The OECD firmly believes that the PISA study, based as it is on international comparisons, not only assesses a range of learning outcomes (OECD, 2007) but also offers information about school performance internationally that may serve to raise the education standards everywhere. The accumulation of these data altogether helps the education system of the country to spot particular strengths and weaknesses and thereby benchmark the stand against the rest of the participating countries (Goldstein, 2004). In this way, it provides an evidence-based information on differences in educational outcomes within and across countries (OECD, 2014) besides garnering an insight into the range of knowledge and skills deemed essential for the individuals to participate in a rapid technologically challenged society (Thomson et al., 2010).

Considering PISA as an important global benchmarking instrument, Sahlberg (2011) asserts more importance on the better use of data regarding students' academic performance. The accumulations of such data can not only track the evolution of students' performance over time (OECD, 2014) but also provide comparative evidence on variation of skills and knowledge across different demography, correlate academic achievement with a range of potential explanatory factors (such as school resources, management strategies and amount of school autonomy) and describe contextual information on pupils' lives (Bloem, 2013; Jerrim & Shure,

1 This age has an exception in some countries such as Turkey and Mexico where the end of compulsory schooling is at age of 16 (Bloem, 2013)

2016). The availability of such information can, if necessary, demand the direct interventions from the government or the relevant stakeholders in addressing the needful assistance. This is crucial to acknowledge because how well the student does in such international assessment indicate the likelihood of themselves being the strong indicator of the nation's international competitiveness (Lusardi, 2015). In a greater dimension, PISA appears as a significant indicator of the success or failure of education policy (Grek, 2009) due to its capacity in becoming the world's premier yardstick for gauging the quality, equality, and efficiency of school systems (OECD, 2014). It plays a central role in policy debates for both OECD and other countries (Figazzolo, 2009) with the range of evidence to track the performance of its own educational system (Mortimore, 2009). The identification of the characteristics of a high-performing education systems in the world by PISA allows the government and educators to understand the features of their educational system in an international context (Sahlberg, 2011; Bloem, 2013) and allows to adapt those systems to their context and remedy with effective policies in improving it (OECD, 2014). In other words, PISA emphasizes on facilitating the dissemination of features of an educational system that leads to the best performances (Cambridge International Examination, 2015) or 'capacity building' (Bloem, 2013).

PISA-D

PISA-D stands for the Programme for International Student Assessment for Development. It is an initiative launched by the OECD in 2013 with a primary aim of facilitating low and middle-income countries to participate in the PISA. The OECD Secretariat were aware of the challenges faced by the low and middle-income countries in participating in PISA. Hence, the Education Policy Committee, which is one of the four specialized governing bodies of the OECD, in October 2012 proposed PISA for Development (Bloem, 2013).

PISA-D would not only benefit the participants of the low and middle-income countries but would also encourage development partners such as donor agencies in providing the financial and technical assistance (Bloem, 2013). Since PISA provides an internationally comparable assessment of the education systems, participation in PISA-D facilitates the participating countries in building an institutional capacity with reference to international assessment scales. Such comparisons can assist in monitoring the progress of their education system and suggest necessary remedies for its enhancement and refinement to work towards achieving Education Sustainable Development Goals. The PISA-D participating countries are Bhutan, Cambodia, Ecuador, Guatemala, Honduras, Panama, Paraguay, Senegal and Zambia (BCSEA, 2017). Some of these countries have already participated in international assessments that would provide a suitable foundation for its participation in PISA-D (Creswell & Adams, 2016). While the PISA-D assessments are paper-based assessment, it will also be assessed in the three domains of reading, mathematics, and science with equal weight for each domain (Creswell & Adams, 2016).

PISA-D in Bhutan

Realizing the significance of participating in international benchmarking systems such as PISA-D to gauge the state of education in our country against the international standards, the Ministry of Education has endorsed its participation during the 18th Annual Education Conference, 12th January 2017 (Ministry of Education, 2017). Besides numerous initiatives undertaken by the Ministry of Education in uplifting the quality of education in Bhutan based on the ten-year strategic plan document the Bhutan Education Blueprint 2014-2024, partaking in such international benchmarking system was one major recommendation amongst the several key strategies and interventions in improving the status of the nation's educational standards (Ministry of Education, 2014).

Bhutan's participation to the PISA-D can have a substantial amount of positive impact towards the education system in our country. It can not only examine how competent our

15-year olds are in the domains of reading, mathematics, and science, but can also assess how creatively and innovatively they can apply the knowledge they possess. The findings can also assist the Royal Government of Bhutan and Ministry of Education, in particular, to gather baseline information of the knowledge, skills, and competencies of our 15-year old learners based on international standard. More importantly, it can contribute to examine the readiness of the Bhutanese schools in joining the main PISA in 2021, besides allowing the stakeholders concerned to realize the potential opportunities and challenges of our education system. The availability of such facts and figures based on the international assessment can largely substitute as a source of established literature for the much-debated but uncorroborated claim in the decline of nation's quality of education.

In Bhutan, a majority of 15-year olds are in grade nine based on the enrolment age of 6 years into the formal schooling. In order to participate in this major international educational endeavour, the Ministry of Education has outlined several approaches in preparing the PISA-D participating schools to equip the students with necessary academic exposures such as by running a PISA-D club and conducting tests having equivalent test items. After the preparatory works have been rolled out in the early February this year, each dzongkhags and schools are mandated to establish its Dzongkhag Level Core Group (DLCG) and School Level Core Group (SLCG). The teachers who are currently teaching in grade nine are by default the prominent members of the SLCG.

Research Design and Methodology

Research Design

This study has employed a survey research design. With the survey research design, the researcher can study the phenomena at the particular moment from respondents that can represent the population for generalization (Creswell, 2003; Williams, 2011). Using this design, this study, aimed to gather the preliminary data from large numbers of participants spread over a wide geographic area under Wangdue district.

Sampling

A purposive sampling method has been used in this study with an intent to involve all the students of grade nine studying at Bajothang Higher Secondary School, Gaselo Central School, Phobjikha Central School and Samtengang Central School. A total of 595 students participated in this preliminary PISA-D preparation assessment survey (see Table 1). The students who were absent during the survey were excluded for the purpose of this study.

Table 1: *Statistics of the students from the four schools who participated in the test*

Schools	**9A**	**9B**	**9C**	**9D**	**9E**	**9F**	**9G**	**Total**
Bajothang Higher Secondary School	25	24	23	29	31	28	29	**189**
Gaselo Central School	40	32	35					**107**
Phobjikha Central School	36	38	38					**112**
Samtengang Central School	37	39	37	34	40			**187**
Total								**595**

** The students who were absent during the test were excluded from the statistics*

Research Instrument

The survey test questions designed in the form of multiple-choice format was used to gather the baseline data for the preliminary PISA-D preparation assessment survey among the four PISA-D participating schools under Wangdue district. The test instrument which consisted of

fifteen items (five questions each) from English, Mathematics, and Science was adopted from the PISA released items (OECD, 2006).

Data Collection

After having obtained the formal approval from the District Education Office, permissions were sought from the principals of the respective schools to conduct the preliminary PISA-D survey. The test schedule was sent to the school before the implementation of the study to avoid disturbances on their academic timings. The deputy chair of the DLCG and the PISA-D focal person from one of the participating school conducted the test. The students were briefed regarding the objective of the study and its significances. The assurance of their confidentiality by the researcher was highlighted and therefore, revealing personal information or the marks obtained by the students were not subjected to any derogatory comparisons other than the purpose of this study. Due to a large number of grade nine students in the four schools, the teachers who were currently teaching grade nine were engaged in the invigilation during the survey test.

Data Analysis

All the items except item 2 and item 4 for reading were multiple-choice based questions. However, these two items also contained only a single phrase or short answer that was accounted for one point only. The wrong or missing items were awarded 0 as 'no credit' and 1 for correct answers as 'full credit' (Kankaraš & Moors, 2014; OECD, 2001). There were no items that were partially correct to achieve the objective of the study. The scores were analyzed by determining the mean and standard deviations. A one-way analysis of variance (ANOVA) and independent-samples t-test was also administered to determine statistically significant differences between the means of participating schools and to compare if the preliminary PISA-D baseline data was affected by the gender respectively.

Results

One-way analysis of variance with post-hoc tests

A one-way analysis of variance was conducted to determine the statistically significant differences between the means of four participating schools. There was a statistically significant difference at the $p<.05$ level for the mean scores of the four participating schools [$F(3, 591) = 23.89$, $p=.000$] as shown in Table 2. Despite reaching statistical significance, the actual difference in the mean scores between the groups was quite small. The effect size, calculated using eta squared, was .10. Post-hoc comparisons using the Tukey HSD test indicated that the mean score of Bajothang Higher Secondary School (M=5.65, SD=2.24) was significantly different from Phobjikha Central School (M=6.83, SD=2.10) and Samtengang Central School (M=7.41, SD=2.24) and, did not differ significantly from Gaselo Central School (M=6.0; SD=1.82). However, Gaselo Central School differed with Phobjikha and Samtengang Central Schools while Phobjikha Central School did not differ with Samtengang Central School.

Table 2: *One-way analysis of variance test*

	Sum of Squares	df	Mean square	F	Sig.
Between Groups	331.512	3	110.504	23.894	.000
Within Groups	2733.218	591	4.625		
Total	3064.729	594			

Calculating effect size for one-way analysis of variance

An effect size was also calculated to examine the magnitude of differences between the mean scores of the four schools. The eta squared was calculated using the formula:

$$\text{Eta squared} = \frac{\text{Sum of Squares between groups}}{\text{Total sum of squares}}$$

$$\text{Eta squared} = \frac{331.51}{3064.71}$$

Eta squared = .10. Thus, the magnitude of the differences between the mean scores of the schools was very small (eta squared = .10).

Mean score of three domains for the four participating schools

The mean score for the three domains has been determined for the four schools. Samtengang Central School has the highest mean scores in all the three domains of English (M=2.80; SD=1.32), Mathematics (M=2.36; SD=0.95) and Science (M=2.26; SD=0.95). The mean scores of Bajothang Higher Secondary School revealed that the students were fairly better in Mathematics (M=1.97; SD=1.36) over English (M=1.75; SD=0.97) and Science (M=1.94; SD=1.05). However, for Gaselo Central School, the mean score for English (M=2.10; SD=1.10) was slightly higher than the mean scores of Mathematics (M=2.07; SD=0.96) and Science (M=1.79; SD=0.96). Similarly, the higher mean score of English (M=2.80; SD=1.30) over Mathematics (M=1.98; SD=1.05) and Science (M=2.03; SD=0.94) for Phobjikha Central School showed that the students were fairly competent in the domain of English. The three participating schools except Bajothang Higher Secondary School displayed a better competency in the domain of reading.

Table 3: *Mean scores of the three domains*

Schools	**Reading**		**Mathematics**		**Science**	
	Mean	SD	Mean	SD	Mean	SD
Bajothang Higher Secondary School	1.75	0.97	1.97	1.36	1.94	1.05
Gaselo Central School	2.10	1.10	2.07	0.96	1.79	0.96
Phobjikha Central School	2.80	1.30	1.98	1.05	2.03	0.94
Samtengang Central School	2.80	1.32	2.36	0.95	2.26	0.95
Mean of the means	**2.36**	**1.17**	**2.10**	**1.08**	**2.01**	**0.97**

Independent-samples t-tests

An independent-samples t-test revealed a statistically non-significant difference between the mean score of male (M=5.77, SD=2.08) and female (M=5.56, SD=2.36) for Bajothang Higher Secondary School at p=.525. Similarly, there was also no significant difference between the mean score of male (M=6.03; SD=1.79) and female (M=5.97; SD=1.85) at p=.525 for Gaselo Central School; male (M=6.95; SD=2.09) and female (M=6.69, SD=2.13) at p=.521 for Phobjikha Central School; and male (M=7.80; SD=2.11) and female (M=7.12; SD=2.32) at p=.564 for Samtengang Central School respectively. Although the mean score of the male was higher than the mean score of the female in all the schools (see Table 4), it showed no significant difference between their performances. This indicates that the performances of the male are better when compared to female counterparts.

Table 4: *Independent-samples t-test of the four schools*

Schools	Gender	N	Mean	SD	Sig. (2-tailed)
Bajothang Higher Secondary School	Male	83	5.77	2.08	.525
	Female	106	5.56	2.36	
Gaselo Central School	Male	47	6.03	1.79	.525
	Female	60	5.97	1.85	
Phobjikha Central School	Male	63	6.95	2.09	.521
	Female	49	6.69	2.13	
Samtengang Central School	Male	83	7.80	2.11	.564
	Female	104	7.12	2.32	

An independent-samples t-test was also conducted to compare the mean scores of male and female under Wangdue district. As indicated in Table 5, there was a statistically significant difference for males (M=6.69; SD=2.20) and females (M=6.32; SD=2.31); t(593) =2.01, at p=.044. This indicated that the males in general performed better than the females.

Table 5: *Independent-samples t-test of the Wangdue district*

Gender	N	Mean	SD	t	df	Sig. (2-tailed)
Male	276	6.69	2.20	2.01	593	.044
Female	319	6.32	2.31			

Calculating the effect size for the independent-samples t-test

The effect size of the independent-samples t-test was determined to examine the magnitude of differences between the mean scores of male and female students using the formula:

$$\text{Eta squared} = \frac{t^2}{t^2 + (N1 + N2 - 2)}$$ where t=test statistic for an independent-samples t-test,

N1= number of males and, N2= number of females.

$$\text{Eta squared} = \frac{2.01^2}{2.01^2 + (276 + 319 - 2)}$$

Eta squared = .0006. Based on the effect size calculated by the eta squared, it indicated that the magnitude of the differences in the means of the males and females were quite small (eta squared =.0006).

Discussion

The ANOVA tests revealed a statistically significant difference between the mean scores of the four schools, although the effect size was found to be very small. Whilst the differences across schools are not as large, it still does exist among the schools that are located within the jurisdiction of the same district. The central schools that formed 75 percent of the sampling in this study indicated higher mean scores in general. However, the differences in the mean scores were also observed amongst the central schools involved in this preliminary

PISA-D preparation assessment survey. This is plausible because factors such as location, infrastructures, accessibility to the information, exposure of the students and time allocated for such educational endeavour to list the few, may determine the general performances. The student characteristics such as socio-economic background are also one element that influences the relative gap between high and low performers as more advantaged pupils are the better performer than the fewer advantage counterparts (Jerrim & Shure, 2016). The relationship between an outcome and socioeconomic background, referred as 'social gradient' represents as a significant indicator for PISA data to characterize students' performance (Thomson et al., 2010). But in general as asserted by Willms and Tramonte (2015), measures such class size, type of community, enrolment, school type, grades covered, funding sources, selective school, infrastructure, computing resources, and teacher FTE must be consistently used in the process of defining the demographic characteristics of the school (p.10). The enhancement of the school infrastructure, among these factors, is essential for PISA-D (Willms & Tramonte, 2015). A good school is necessarily not a place that produces higher educational achievements in international assessments and therefore, labelling it good or great using only such data is not adequate (Sahlberg, 2011). Accordingly, it is understandable that the diversity in the schools' performances based on this preliminary PISA-D preparation assessment survey is the result of any one of such factors alone or the combination of all.

Although there were no statistically significant differences in the mean scores of male and female for all the schools as revealed through independent-samples t-tests, the male students in general performed relatively better than their female counterparts with higher mean scores. But in overall, it was observed that there were statistically significant differences between male and female in Wangdue district. Such findings were not unusual as the similar gender gap in the three domains were also observed in many OECD countries (Jerrim & Shure, 2016). In England and many other countries, boys out-performed girls in mathematics while it was vice versa for reading and equal to science (Jerrim & Shure, 2016). Likewise, similar significant differences in the favour of the female were observed in all PISA 2009 countries in the domain of reading (Thomson et al., 2010). Females in Australia, for instance, was 37 score points higher than males, which was equal to a full year of schooling (Thomson et al., 2010). To this effect, Thomson et al (2010) affirm that the emergence of such gender differences in PISA to be a 'salutary reminder' for the schools and systems alike to realize that it is still a concern. While there is no any standard yardstick to benchmark the performances of the students as high or low for this preliminary preparatory assessment survey, the tests results obtained from the schools that have institutionalized PISA-D clubs and coaching classes for nearly four months was moderately constructive particularly in this early stage of its preparatory phase. The mean scores are not dreadful albeit the progression in the achievement of higher scores should be deemed as a necessity.

PISA does not end its purpose with the reproduction of knowledge, rather it assesses 15-year-olds' ability to extrapolate the content knowledge into a new situation (OECD, 2014). Hence, the emphasis of [our] schools in defining the word 'literacy' must concentrate broadly and not merely be capable of reading and writing (Thomson et al., 2010). Scientific literacy should encompass the application of scientific knowledge to ones' life situations and not merely emphasizing facts and information. Such distinction is essential to understand although it might seem subtle (Bybee, 2006). The more emphasis we place on such trend of nurturing the students to attain knowledge and skills necessary for the participation in the society, it can at best, transform themselves into nation's potential economic factor, or least, can prepare and coach to be potential international benchmarking test takers.

Conclusions

This preliminary PISA-D preparation assessment survey was administered to 595 grade nine students of Bajothang Higher Secondary School, Gaselo Central School, Phobjikha Central School and Samtengang Central School – the PISA-D participating schools under Wangdue district. Statistical significant differences were observed between the mean scores of the four participating schools but with a very small effect size. The students of the three schools except Bajothang Higher Secondary School have performed with much higher means for the reading domain. Although there were no significant differences between the mean scores of male and female for all the schools, the males, in general, have performed better with a relatively higher mean score. A significant difference was observed in the mean scores of male and female under Wangdue district but with a very small effect size.

The potential use of PISA for monitoring education systems and policy changes by the policy-makers based on its results infers a need to have the good understanding of the meaning of the results for appropriate policy interferences because its partial or misinterpretation would consequently lead to misguided or incorrect interventions (Cosgrove & Cartwright, 2014). Hence, the differences in the mean scores obtained based on this preliminary PISA-D preparation assessment survey would not be adequate to conclude as a firm and statistically reliable yardstick to measure the real variances amongst the four participating schools. Neither it is capable of making comparisons with any other tests – national or international – owing to a limited number of items used in the survey. It was in no way either, intended to degrade or gauge the performances of the schools which are still in the progress of preparing for such international benchmarking assessment in its own capacity and pace. Nevertheless, the findings of this study would be a greater support for the school administrators and teachers, in particular, to develop and plan for more dynamic and robust strategies in further supplementing the PISA-D programmes in the schools. These findings are expected to have some implications on analysing the status of the schools' preparation towards the PISA-D tests precisely for Wangdue district. A study such as this can also encourage the teachers to assess and determine the learning abilities of their students in the domains of reading, mathematics, and science by conducting a small-scale research of their own in the near future.

Limitations of the Study

The conclusions drawn in this survey study were completely grounded with the assessment scores from the four PISA-D participating schools under Wangdue district. Hence, there is its limit of generalizability. The number of items was relatively less, due to which it might have affected the general findings of this study.

Recommendations

Critical to the success of the Ministry of Education's ambitious plan in preparing our 15-year-olds for the international benchmarking system is operationalizing a smooth PISA-D programme in the schools. In order to facilitate the effective institution of such programs, this study proposes the following recommendations:

i) Making of PISA-D as a regular school phenomenon by institutionalizing it with a comprehensible framework along with the provisions of necessary prerequisites are fundamental. Determining factors such as 'teacher autonomy and motivation' as in the case with Finnish schools (Grek, 2009), access to training and resource toolkits for teachers and reliable internet connectivity in the schools needs to be carefully considered.

ii) Most of the items included in this international test are competency-based questions which are almost new to many of our teachers in the field. In order to make our students competent and analytical, they have to be rigorously drilled within the competency-based

evaluation system. This would be only possible if relevant agencies and stakeholders organize training for the teachers in designing competency-based questions in the first place.

iii) The system of including competency-based questions can be further extended as a usual phenomenon in our school examination practices. Our purpose of preparing for such international assessment such not be confined as contending with the education systems of the other economy as though we are running for an educational contest, but more than everything, our participatory experiences should foster in our students the growth and acquisition of knowledge and skills that are essential for the participation in the society. In the end, the countries performing better in PISA are seen more alluring for economic and human capital investment (Grek, 2009; Eivers, 2010).

iv) The inclusions of the competency-based questions in the Board Examinations by the Bhutan Council for School Examinations and Assessment (BCSEA) in the recent years should be further consolidated and extended. Such practices by the responsible national assessment agency would not only enhance the proliferation of awareness to schools around the nation uniformly and timely but can also function as a point of reference for the resources and materials in the times of need.

v) The released items of the PISA and PISA-D tests are readily inaccessible even from the internet sources. To overcome the scarcity of such standardized tests items, the responsible agencies such as Ministry of Education or BCSEA can gather the examination test items from various schools and sieve the ones that meet the standards of the international test quality. These resources can be then made easily accessible to the schools from one reliable point of source.

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About the Authors
Dumcho Wangdi is currently working in Bajothang Higher Secondary School in Wangdue district. He has obtained his Bachelor's Degree in Education from Samtse College of Education in 2007 and M.Sc. in Science and Technology Education from Mahidol University in Thailand. His research interests include pedagogical practices in science education, 21st century teaching skills and teacher professional development. He can be contacted at dumchowangdi@education.gov.bt.

Shankar Lal Dahal is working as the Principal at Bajothang Higher Secondary School under Wangdue district. He has graduated with Post Graduate Certificate in Education from Samtse College of Education in 1995 and M.Ed in Leadership and Management from Paro College of Education in 2008. Along with the Royal Education Council, he was involved in writing the science textbooks for classes IV to VIII for the last six years besides facilitating numerous science workshops both at district and national level. His research interests are towards enhancing teaching and learning processes.

Sonam Tshomo obtained her Bachelor's Degree in Education from Samtse College of Education in 2007 and M.Sc. in Physics from Universiti Teknologi Malaysia, Malaysia in 2012. Currently, she teaches physics at Bajothang Higher Secondary School in Wangdue district. She can be contacted at sonamtshomo1985@education.gov.bt.

Pema Dorji works as the Chief District Education Officer at Wangdue District. He has M.Ed in Leadership and Management from Paro College of Education. Prior to his appointment as the Chief District Education Officer, he worked as the Principal of Tangmachu Middle Secondary School under Lhuentse district. His research interest focuses mainly towards mainstreaming education in the schools of Bhutan.

Entrepreneurial Perception of University Graduates of Royal University of Bhutan

Phurba Sonam Waiba

Abstract

Unemployment is a major issue globally. Gainful employment and entrepreneurship is a top priority in Bhutan and around the globe. And youths being the most among the total unemployed people, understanding their perception towards self-employment is an immediate need. Thus, this study assessed entrepreneurial perceptions of the graduates of Royal University of Bhutan (RUB) using Ajzen's Theory of Planned Behaviour. A total of 315 graduates were surveyed through 11 item multiple choice questionnaire and analysed using Statistical Package for Social Sciences version 21. Descriptive statistics were used to provide the demographic details and perception was interpreted using cross-tabulation across various age groups, gender and educational background.

It was found that; more mature the graduates are, more is their entrepreneurship perception; graduates with more of entrepreneurship, business and management modules have shown best interest in entrepreneurship compared to others; both the male and female graduates have almost equal interest and desire for entrepreneurship. The study, therefore, recommends integration of entrepreneurship course in the tertiary level education and educate society about the importance of self-employment and entrepreneurship in pursuit of creating an enterprising society.

Keywords- *Royal University of Bhutan (RUB), Entrepreneurial Perception, University Graduates, Theory of Planned Behaviour (TPB).*

Introduction

Unemployment is a major challenge for most of the government in the world, especially unemployment among youth (Schoof, 2006). According to world employment and social outlook 2017 by International Labour Organization, world unemployment rate in 2016 is 5.7 percent and would rise to 5.8 percent (201.1 million) in 2017, and indicated that unemployment rate would rise likewise in the coming years. On the other hand, as ILO estimated and Elder and Rosas (2015) found, the youth unemployment rate was 13 percent (73 million) in 2014 which was 41 percent of total unemployed persons globally (Haftendorn & Salzano, 2003). Hence youth unemployment is on a rise worldwide.

Similarly, taking the issue in Asia and Pacific region, the unemployment rate ranges from 5.7-3.1 percent. Australia had the highest unemployment rate with 5.7 percent and lowest in Japan with 3.1 percent as per ILO world employment and social outlook in 2016. In Bhutan, the labour force survey 2016 carried out by Ministry of Labour and Human Resources reported 2.1 percent unemployment rate which would mean Bhutan is among the countries with lowest unemployment rates in Asia.

Hence, the overall unemployment rate of 2.1 percent in Bhutan is considerable and much better compared to the global trend which is 5.7 percent as of 2016 as per world employment and social outlook 2017. Having said that, the concern is that youth unemployment rate has increased from 9.4 percent in 2014 to 10.7 percent in 2015 (Dendup & Acharja, 2017) and likewise 13.2 percent in 2017 (MoLHR, 2017). Further, the trend is likely to with the increasing number of graduates in the job market yearly, move for efficient and compact public sector, and immature private sectors. Hence, in such situations, entrepreneurship is an option one can undertake (Fatoki, 2014).

Lately, policy makers, academicians, educators and economists have felt the need and importance of entrepreneurship. They are keenly interested to foster entrepreneurial

competencies and awareness amongst the young graduates which would not only help them start-up self-employment ventures but also help the government reduce unemployment and economic related issues in the country (Othman & Ishak, 2009). Similarly in Bhutan, the Economic Development Policy (2016), and National Human Resource Development Policy (2010), in recent years have placed a greater commitment to entrepreneurship development. It has highlighted on the establishment of an autonomous Entrepreneurship Development Institute by 2018, boosting Cottage and Small Industries to promote entrepreneurship and also identified critical skill training needs to entrepreneurs to encourage more entrepreneurs in future. Likewise, Ministry of Labour and Human Resources, under Entrepreneurship Promotion Division has been providing basic entrepreneurship and advance entrepreneurship training so as to encourage start-up business in pursuit of job creation and employment generation. This has been a regular training provided by the Ministry and until recently it embarked on another two new programs viz, Earn and Learn and Online Freelancing Programs which is operational to date. On the other hand, numerous advocacy and awareness programmes and business idea competitions such as startup weekends, global entrepreneurship week, national skills competition and the business idea competition have been initiated as well. Apart from this, there are many other organizations rendering support, loan and credit facilities including the financial institutions and NGOs like Loden foundation. Despite the lucrative business opportunities and these entrepreneurship development programs, graduates have not shown much interest. Hence it is crucial to understand and analyse the perception of graduates who represent a major section of the labour market in the country to make informed decision and planning.

The concept of entrepreneurship evolved as early as 17th Century (McStay, 2008)). It helps one to innovate (Abebe, 2015) and to create gainful employment for self and others (Ekpoh & Edet, 2011). Weber (1930) supports that it helps in economic expansion and create new markets (Schumpeter, 1975). In a broader sense, entrepreneurship is an intangible academic discipline that helps individual convert ideas into products and services and in the long run generate wealth and employment (Willie, et al., 2009). In short, entrepreneurship is about new activities, being able to perceive new opportunities and enabling them to work in various social areas (Dendup & Acharja, 2017).

In addition to this, understanding and discovering individual's entrepreneurial attitudes have been considered by several authors and asserted that it is the predictor of one's future entrepreneurial behaviour. Thus, 'understanding the antecedents of entrepreneurial intentions increases our understanding of intended entrepreneurial behaviour' (McStay, 2008, p.7) and that the government and the policymakers will be in better position to understand and plan to allocate resources for intended programs and activities (Ajzen, 1991).

Problem Statement

Bhutan has witnessed a great deal of socio-economic advancement since the 1960s and it's no surprise to us that this rapid development has also posed numerous threats on the country and the citizen, one of which is unemployment, and youth unemployment in particular. Today, it has been the most pressing national issue and in the face of such high youth unemployment (Dendup & Acharja, 2017), and negligibly fewer job opportunities, the need of entrepreneurship today has become more important and relevant than ever before (Ministry of Education, 2010).

On the other hand, the problems associated with high unemployment are increasing day by day. Some of the studies have claimed that most of the property crimes and drug offences are closely correlated to high youth unemployment (Fougere, Kramarz, & Pouget, 2009). Similarly, a case study in Sweden has indicated that the root of crimes and criminal offences in youth is attributed to being jobless (Groenqvist, 2011), also there are many incidences and disastrous demonstrations globally rooted and triggered by this section of hungry unemployed youth (Levitt & Dubner, 2006), and Bhutan would face similar challenge in future if similar youth

unemployment trend continues. Until recently, Bhutan has been witnessing lots of criminal activities which can be assumed that most are related to the youth who have been unemployed.

Hence, it is crucial for us to explore and understand university graduates and create gainful employment opportunities, to which one obvious alternative would be discovering their perception towards entrepreneurship which is not only lucrative but also helps in the economic development of our country.

Therefore, due to increased importance and need of entrepreneurship and understanding entrepreneurial behaviours in an individual for intended career path decision in future, this study aims to access the perception of graduates under the Royal University of Bhutan. It examines the perception of university graduates towards entrepreneurship by age, gender and course.

Literature Review

The general understanding of self-employment by various authors have been different in different times (Dendup & Acharja, 2017), of which many of them tried to express the same thing that it is about opportunity creation, newness, creativity and risk-taking (Utha, et al., 2016). Also, it has been stated that the idea and sense of entrepreneurship are not confined to any country or region rather it is dependent on individual's desire and interest (Abebe, 2015). The term and the idea of entrepreneurship came as early as 17th century through late economist Richard Cantillon (McStay, 2008), and thereby it gained momentum until late 18th century when Ajzen in 1991 asserted the theory of planned behaviour. The theory explains that attitudes, intentions and beliefs of an individual are the predictors and that can inform their intention to perform that behaviour (Ajzen, 1991). Similarly, it has also been added that there are certain factors for an individual to develop entrepreneurial behaviour such as beliefs, attitudes and experiences as explained by Social Cognitive Career Theory. It also explains how an individual form interests and make choices of their occupational pursuits (Lent, Brown, & Hackett, 1994). Personal and situational variables are also the factors that can influence entrepreneurial intentions, which in fact influence attitudes and perceptions (Krueger, Reilly, & Carsrud, 2000). Similarly, entrepreneurship education and previous entrepreneur experience will affect entrepreneurial intentions only if they change their key attitudes and perceptions (McStay, 2008).

Theoretical Framework

The study has been developed based on Ajzen's theory of planned behaviour considering personal attitude, social norm and perceived behavioural control towards entrepreneurship. Theory of planned behaviour (TPB) was initially proposed by Icek Ajzen in 1985, it links beliefs and behaviour (Ajzen, 1991). This theory has been found applicable and convenient in various aspects such as education, business and government level policy examination.

Concepts of key variables

1. Personal Attitude: It is the attitude of a person towards the behaviour. "It refers to the degree to which a person has a favourable or unfavourable evaluation of the behaviour in question. In general, the more favourable the attitude toward the behaviour, then stronger will be an individual's intention to perform the behaviour" (Ajzen, 1991, p.116).
2. Social Norm: The social pressure/influence to perform or not to perform the entrepreneurial behaviour. It is assumed that social norm is determined by the beliefs or likelihood of important individuals or groups approve or disapprove performing a given behaviour.
3. Perceived Behavioural Control: It is the ability or the being able to undertake a given behaviour. In a broader sense, it is the perceived ease or difficulty of undertaking a behaviour with the known facts, past experiences and anticipated outcomes.

Determinants of Entrepreneurial Interest/intention drawn from the variables (Figure I)

Gender: Usually it may sound like entrepreneurship intentions and behaviour is a predefined nature to human but it is not, rather it is the gender (usually male) and the formal entrepreneurial education that changes the mindset of an individual to set for entrepreneurship (Czuchry & Yasin, 2008).

Family background: Family and societal experience were some factors that could influence entrepreneurial behaviour in an individual (Ajzen, 1991), (Krueger, 1993).

Policies & regulations: The conducive environment and the policies favouring the interested individuals is also one of the leading factors affecting entrepreneurial behaviour and intention (Goodbody, 2002).

Perceived desirability: As stated above it was Ajzen (1991) and Krueger (1993), who postulated the models and verified that perceived desirability can affect entrepreneurial intentions. These models led to two famous theories, Ajzen's Theory of Planned Behaviour (Ajzen, 1991) and Shapero and Sokol's Entrepreneurial Event Model (Krueger, 1993).

The propensity to act: The ability and will of an individual to take initiatives, or carry out a task or start a business individually. In some instances, it has been observed that even if the individual is highly motivated and has enough capital for a business, the possibility to start a business is hampered by the low propensity to act (Marvin, 2014).

Social desirability: Subjective or social influence is the perceived social pressure on a person to perform or not to perform the target behaviour (starting a business). Having said that, it has also been found that social desirability and influence can vague by some factors such as individual belief of how we take the social influence, and the entrepreneurship-friendly environment in which an individual is brought up. Hence, these factors can deter the influence and change in the intention of an individual to perform a task (Marvin, 2014).

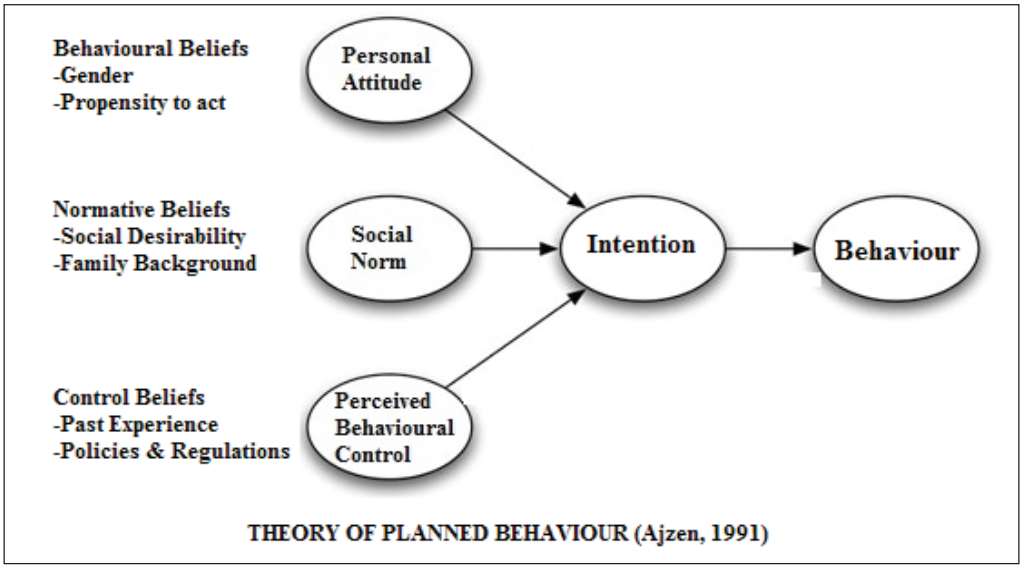

Figure I. *Conceptual Framework: Theory of Planned Behaviour*

Methodology

The sample size for the study was 343 graduates using Yamane formula. These graduates were from the population of 1,128 graduates of the Royal University of Bhutan. Purposive sampling technique was used to ensure that the sample obtained has an almost equal number of graduates in each course category; the survey was conducted during the 17th National Graduates Orientation Program 12th to 19th August 2017 at Royal Institute of Management Hall. Data for the study were collected using questionnaire. The questionnaire was designed in two sections; the demographic profile of the respondents (age, gender, course, job preference) and the perception towards entrepreneurship.

In the demographic section, the age groups (in years) used were; 20-24 yrs., 25-29 yrs., 30-34 yrs., 35 yrs. above. The course categories were; General B.A courses, Bachelor of Science, Bachelor of Engineering/Tech., Business studies and other Language and Cultural Studies. The perception was measured using seven statements on an ordinal scale of agree, undecided and disagree.

Data analysis methods and statistical planning

A total of 400 respondents were randomly selected ensuring equal representation of all course categories and gender. The questionnaires were sent to all 400 graduates but only 315 responses were received. The data collected through questionnaire were analysed through Statistical Package for Social Sciences (SPSS) version 21. First, the data was analysed using descriptive statistics to provide demographic details using frequency and percentage, and then cross-tabulated to interpret the perception of respondents (percentage of agree on responses) towards entrepreneurship across various age groups, gender and courses studied.

Profile of Respondents

Table I. *Demographic profile (frequency & Percentage) of respondent by gender, age and Faculty/course.*

Respondent Profile		Frequency	Percentage
Gender	Male	158	50.2
	Female	147	49.8
Age	20-25 yrs.	235	74.6
	26-29 yrs.	75	23.8
	30-34 yrs.	3	0.9
	35 yrs. abv.	2	0.6
Faculty/Course	B.A	50	15.9
	B.Sc.	67	21.3
	B.E/B.Tech	62	19.7
	Business	73	23.2
	Language & Culture	63	20.0

The gender, age and faculty composition of the respondents are presented in Table 1. General job preference status of the graduates indicated that almost more than half of the graduates preferred for a job in Government sector (62.5 percent), 52.3 percent female and 47.7 percent male and negligibly they preferred for private/corporate or self-employment.

Graduates' Entrepreneurial Perceptions across Age groups, Gender and Courses Studied

The graduates' perception towards entrepreneurship was assessed on the basis of seven statements. Table II, III and IV, gives the percentage of the 'agree' on responses for each of the statements across the various age groups, gender and courses studied.

Table II reveals that the graduates' perception towards entrepreneurship varied in each of the age groups with maximum (95.2 percent) of the graduate aged 30-34 years and minimum (45.2 percent) aged 35 years above. It was also found that young graduates aged 20-24 years and 25-29 years have indicated about 50 percent which could mean that they have not been able to decide and know much about entrepreneurship.

Having said that, the results clearly depicts that the desire to do something different with great value and asset, wanting to undertake self-employment, having enough knowledge and propensity is increased with age but not until or above 35 years. This could mean that self-employment perception and desire increases with maturity but not until one starts to get old crossing 35 years and above. Some of the determinants of entrepreneurial intention is social norms and perceived behavioural control, and a young graduate without any kind of experience and capital investment, will be difficult to undertake self-employment as their propensity is hampered whereas, a middle-aged graduate (who would have worked before or is an in-service candidate) would have enough information and idea to undertake self-employment (Krueger, 1993), (Marvin, 2014). Similar results were found by other authors that modal age range for entrepreneuring is 30-35 years (Marvin, 2014).

Table II. *Entrepreneurial perceptions across age groups*

STATEMENT	20-24 yrs. (%)	25-29 yrs. (%)	30-34 yrs. (%)	35 yrs. abv.(%)
I want to do something different with great value and asset	73.6	80	100	50
I have seriously thought to start my own business or self-employment venture	14.9	18.7	66.7	16.2
I can manage financial, psychological and social risks if I am to start self-employment	46.8	50.7	100	0
I want personal satisfaction and income without being under others	54.5	45.3	100	50
I have required technical, managerial and entrepreneurial skills	41.7	61.3	100	50
I have a role model(s) who have started business and I am proud of the figure	92.3	93.3	100	100
I feel that self-employment is the only avenue to survive in future	43.8	58.7	100	50
AVERAGE (%)	**52.5**	**58.3**	**95.2**	**45.2**

Table III shows that both male (54.4 percent) and female (54.1 percent) graduates indicated almost equal interest in entrepreneurship, this result is different from many other findings as most researchers claim that men are more likely to desire for entrepreneurship, even the literature pointed out that gender (usually male) is one main determinant of entrepreneurial perception (Czuchry & Yasin, 2008). This finding could mean that given the Bhutanese graduate's context both men and women are equally able and interested for entrepreneurship and this is because both male and female do have equal treatment and opportunities, and are accessible to similar colleges and field of education.

Table III. *Entrepreneurial perceptions across gender*

STATEMENT	Male (%)	Female (%)
I want to do something different with great value and asset	75.8	74.7
I have seriously thought to start my own business or self-employment venture	19.7	12.7
I can manage financial, psychological and social risks if I am to start self-employment	47.8	48.1
I want personal satisfaction and income without being under others	49.7	55.7
I have required technical, managerial and entrepreneurial skills	45.9	48.1
I am proud of the people who have been self-employed and are very successful	90.4	94.9
I feel that self-employment is the only avenue to survive in future	51.6	44.3
AVERAGE (%)	**54.4**	**54.1**

The study investigated whether there are differences in entrepreneurial perceptions across the courses studied. Tables IV shows that graduates who studied Business Studies (60.5 percent) seems to be the most interested in entrepreneurship, this is followed by graduates who studied B.A General, B.E/B. Tech and B.Sc. indicated more than 50 percent interest and graduates studied Language/Culture Studies seem to be the least (48.5 percent) interested in entrepreneurship.

Thus, the graduates' entrepreneurial perceptions are not the same across the courses studied. These differences in entrepreneurial perceptions can be seemingly due to the different skills the courses studied and their exposure, and on how well the graduates learnt the skills and the ease/value of the practicality of the skills in the society.

General B.A graduates rated 100 percent on the statement "I have a role model(s) who have started business and I am proud of the figure", and 76 percent on "I want to do something different with great value and asset", indicating their inclination towards self-employment but they lack required technical, managerial and entrepreneurial skills lowering their propensity to undertake self-employment. Hence, contrarily they rated just 18 percent on "I have seriously thought to start my own self-employment venture". Similarly, graduates taking Business Studies rated 60.5 percent in an overall perception, highest among all the courses but they rated just 19.2 percent on "I have seriously thought to start my own self-employment venture". So, from the above observation, it can deduced that irrespective of the courses entrepreneurship and business ideas classes must be integrated as a part of the course content in the colleges so that the graduate's perception can be increased.

Table IV. *Entrepreneurial perception across faculty/course studied*

STATEMENT	General. B.A(%)	B.Sc. (%)	B.E/B. Tech(%)	Business Studies	Lang/Culture Studies(%)
I want to do something different with great value and asset	76.0	71.6	75.8	79.5	73
I have seriously thought to start my own business or self-employment venture	18.0	11.9	17.7	19.2	14.3
I can manage financial, psychological and social risks if I am to start self-employment	50.0	44.8	41.9	58.9	42.9
I want personal satisfaction and income without being under others	42.0	62.7	58.1	53.4	44.4
I have required technical, managerial and entrepreneurial skills	34.0	34.3	53.2	69.9	38.1

I have a role model(s) who have started business and I am proud of the figure	100.0	83.6	98.4	94.5	88.9
I feel that self-employment is the only avenue to survive in future	68.0	47.8	41.9	47.9	38.1
AVERAGE (%)	55.4	51.0	55.3	60.5	48.5

Conclusion

The first finding indicated that with maturity entrepreneurial perceptions increases in the graduates and according to the theory of planned behaviour, with maturity a person will have informed perceived behavioural control to undertake entrepreneurship with ease such as past experience and will be psychologically strong (Ajzeen, 1991). It has been explained by Alexander, (2014) states that innovation is inversely related to regulation. So, if immature and young graduates take up business, they would lack policy and regulatory knowledge. Contrarily, a person with higher level of maturity will have sound knowledge of policy and regulation about the business and won't be a problem. Thus, maturity is a key personal attitude or a behavioural belief that enhances propensity to undertake entrepreneurship. Therefore, as explained by Marvin, (2014), maturity is an important factor to consider. Hence, older graduates must be assisted for any entrepreneurship activities or programs.

The second finding showed that graduates of Business Studies showed the best interest in entrepreneurship compared to other courses. As explained by the Ajzen, perceived behavioural control or the control beliefs are derived from the business study a graduate undergo (Ajzen, 1991). Therefore, due to enhanced business ideas and management skills, a graduate is found to have more intention/perception towards entrepreneurship. This finding can also be attributed to exposure to entrepreneurship courses and modules the business graduates have in their curriculum. Hence the finding can be noted to indicate that the entrepreneurship courses and knowledge have an inclination to entrepreneurship perception.

And the third finding indicated comparably both the male and female graduates have equal interest and desire for entrepreneurship/self-employment. Many other papers have claimed that the entrepreneurial perception of males is higher and finding in the study is similar. Thus, the result is indicative of the fact that both male and female has been treated well, and equally educated with no disparity/difference resources and knowledge.

Discussion/Recommendation

One of the major issues observed in the study is that all most all the graduates seem to prefer government sector occupations and least for self-employment and this is because they indicated they do not have required entrepreneurial skills and managerial quality to undertake, also they do not think self-employment is the only avenue to succeed in future, in this regard perceived behavioural control according to Ajzen, (1991) is a concern.

So, primarily certain programs should be designed to impart a spirit of entrepreneurship and business concepts. This could be integrated throughout the curriculum, as an optional subject or an after-school activity (Haftendorn & Salzano, 2003). Another level of intervention could be enhancing technical and vocational education and training like many countries globally, in which the trainees must be exposed to enterprise education through technical knowledge and commercial environment (example: company registration, seed fund utilization, product development and business competition).

As per the need of the study, intervention at tertiary education system would have a great impact, as the findings indicate more entrepreneurial perception with maturity. Thus, entrepreneurship modules could be introduced in non-business programmes in all the institutes and colleges for adults so that this would enhance personal attitude and control beliefs according to the Ajzen's theory.

On the other hand, entrepreneurship perception for young children can be encouraged by parents at home and enhance their normative belief and control beliefs as stated in the conceptual framework.

Prior to letting parents encourage children at home (as most parents don't have business/ are negative about entrepreneurship), there is a need to change societal concept (social norm) and negative societal belief for entrepreneurship. Parenting awareness programs must be initiated to motivate the parents and society, they must realize that business/entrepreneurship is a recognized and is a noble profession. As a matter of fact, perceived behavioural control and desirability of the children is not hampered by the societal perception. Also, there should be a program in place to engage the parents and society in village skills development programs (weaving, basket making, sculpturing, embroidery, etc.) so that they are encouraged to undertake business. Studies have proven that children's entrepreneurial perception and their parents owning a business have a strong correlation.

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About the Author

Phurba Sonam Waiba, is an Employment Officer at Human Resources and Skills Development Division (HRSDD), Ministry of Labour and Human Resources (MoLHR), Thimphu; holds Post Graduate Diploma in Public Administration (PGDPA) from Royal Institute of Management (RIM), Semtokha Bhutan and under graduation from Sherubtse College, Kanglung Bhutan with Bachelors of Science in Life Sciences. His areas of research include Ethno-botany, Palynology, Public Health and Medicine, Job Satisfaction and his research interest include Botany and Educational researches in youth, employment and entrepreneurship