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THE USAGE OF ICT FOR TEACHING AT A BHUTANESE COLLEGE

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Abstract

Students today are connected through computers, instant messaging, intranet, internet, and cell phones. In order to cater to the students' experience with technology, corresponding changes in pedagogy and curriculum should happen ([1] p.2). Students in Bhutan are also exposed to technologies like any other students in the world. The number of internet users has been on the rise in Bhutan, and is recognized by the country's political leadership. In line with this development, Bhutan is embarking on a comprehensive process of education reform with teachers and teacher education at the centre. Samtse College of Education (SCE) as one of the teacher education colleges under Royal University of Bhutan is a key player in the reform process. The college has introduced learning management systems, ICT support for administration, and blended online distance education.

In order to examine the usage of ICT in teaching by the lecturers of SCE, a preliminary investigation was carried out. The study consists of a survey and a focus group interview dealing with the broad themes skills and competence, attitude and motivation, and access to resources and internet. The findings from this investigation reveal a general agreement on the use of ICT as an enabling factor for effective delivery of lessons. However, the motivation level among faculty is found to be low, which was related to resource constraints, lack of IT support, and poor and unstable internet connection. There are also variations amongst the lecturers in terms of competences, professional training, skill level and in their individual use of ICT for teaching. We conclude by discussing the general relevance of these findings, as well as outlining future research.

Keywords: ICT, teaching, Royal University of Bhutan, VLE, survey

1 INTRODUCTION

Students today live in a world significantly different from that of yesterday. They are connected through computers, instant messaging, intranet, internet, and cell phones. This must result in changes also in pedagogy and curriculum [1 p.2]. Beetham and Sharpe [2 p. 5] state that “teachers should be free to respond critically as well as creatively to these new technologies, but they cannot afford to ignore them if they want to engage with their learners”. In the 21st century there is a growing demand for learning combined with technology and this is now challenging traditional universities around the globe. This can also be said to be true for higher education in Bhutan, the topic of this paper.

It has been acknowledged for quite some time now that technology mediated learning, in particularly asynchronous learning through Internet, will become a major vehicle for fulfilling the needs for lifelong learning [3]. In what can be seen as a paradigm shift in education around the globe, Bhutan can not exclude itself if the country aspires to modernise its educational system in line with the way it is seen in global education. As discussed by Coto [4] in her study on Costa Rica, higher education cannot remain in isolation when globalization has created a new cultural, social, political, professional, and technological context. This changed context requires new ways of communicating, interacting and learning, and even with a history of isolation from the Western world this can also be said to be true for Bhutan. Coto further states that teachers today need to cope with the changes and developments worldwide in learning and it is expected that they are competent in terms of integrating content, pedagogy and technology. However, this is an expectation which is not easily met by teachers and lectures without appropriate training, support and experience.

Bhutan is embarking on a comprehensive education reform process with teachers and teacher education at the centre of a number of initiatives. Starting in 2004, systematic efforts have been made to introduce information and communication technology (ICT) for learning support into its distance teacher education program at SCE [5]. For this purpose, an open source learning management system is used (Moodle). However, till 2009, the usage of ICT was confined mostly to administrative support, information dissemination and delivery of lessons. In the RUB since its establishment there has been a radical change in the curriculum both in design and delivery.

1.1 Purpose of the study and research questions

The general aim of the study is to get an in-depth understanding of how ICT is used in teaching and what factors influence or impact the same at SCE. Keeping this purpose in mind, the following overall research questions were formulated:

a) What is the stand on ICT integration for teaching at SCE?

b) What problems or concerns do lecturers identify in relation to integration of ICT in their teaching?

1.2 History and background of Bhutan

Bhutan, a small country situated in the eastern Himalayas on the Indian subcontinent has a small population of 695,822. The country is known to the world for its unique culture and heritage. It has 470 kilometres borders to the Tibet region of China to the north and northwest, and 605 kilometres to the Indian state of Sikkim to the west, West Bengal to the southwest, Assam to the south and southwest, and Arunachal Pradesh to the east [7].

For many years, the area of what is now known as Bhutan housed a number of minor fiefdoms. In the 17th century the country was unified by Shabdrung Ngawang Namgyal, a Tibetan lama and military leader, who went into exile in Bhutan. The current king belongs to the Wangchuk Dynasty which has ruled the country since 1907. Today, Bhutan has a constitutional monarchy and the first parliamentary elections were held in 2008. The modern educational system in Bhutan has found inspiration in the British empire, and today education is considered a very important means towards development. Schools in Bhutan are free, as is further and higher education.

Partly due to its geographical position and partly due to decisions made by the ruling dynasty, Bhutan has been somewhat isolated from input from the outside world. Until 1999, a ban on television and internet was in effect, thus making Bhutan one of the last countries in the world to introduce television. In July 2000, a state owned telecommunications and internet provider was established, and internet connectivity is now available in most parts of the country.

1.3 The educational system in Bhutan

Bhutan has a short history of modern education. The country has recently celebrated 100 years of modern education. Modern education system in a proper form was first introduced in the 1960s. Prior to that, the most common form of education was a system where each family in a village or district sent one member of their family to receive monastic education. However, with the development of friendly relations with the immediate neighbour India, students were sent to India to study, as schools were not established in Bhutan by then. Gradually the third king (referred to as the father of modern Bhutan) established modern education [8].

As stated in the Constitution of the Kingdom of Bhutan (2008), the state provides free education to all children of school going age up to grade 10 and ensures that technical and professional education is made generally available and higher education made equally accessible to all on the basis of merit. In the present formal educational system, there is a hierarchical structure and chronologically graded learning, which requires certification for the learners to progress through the grades to advance to a higher level [7].

As part of the general development, methods of learning have also moved from the traditional ways towards more modern methods. Phuntsho [9] defines traditional education in the following way: “learning and pedagogical practice passed down to the present day Bhutanese by the indigenous scholars (…) either in written or in oral form in the medium of classical or vernacular languages of Bhutan”. Modern methods of learning are defined as “the recently established system of learning, which consists of various strands of western methods of education and pedagogy received either directly from the West or through India and transacted mainly in the medium of English” (ibid, p. 3).

With the initiation of modern teaching methods the literacy rate of the country has increased from 40 % in 2006 to 59.5% in 2010 [7].

The education system is now based on the Gross National Happiness (GNH) philosophy propounded by the fourth king. The Ministry of Education has provided support in the form of training for school principals and teachers to implement GNH principles in teaching and learning in the class as well as in management [10].

Bhutan launched its one and only university, the Royal University of Bhutan (RUB), in June 2003 under a royal charter. One central objective of the university as stated in the charter [11 p. 3] is:

"To promote and conduct research, to contribute to the creation of knowledge in an international context and to promote the transfer of knowledge of relevance to Bhutan."

The head of the university is the Vice Chancellor. The university has four departments each headed by a director. RUB has ten colleges which are spread across the country. The respective colleges have their own study programmes which are unique to the individual colleges In spite of this independency in study programmes, the colleges work in union in areas like planning, resources, curriculum development and shared costs to enhance their efficiency [11].

1.4 ICT Milestones in Bhutan

Today, despite difficult terrain and sparsely populated human settlements, people in Bhutan have access to terrestrial, satellite and mobile telephones, radio, print media, television and Internet. Bhutan began its first rudimentary work in building a telecommunication network in the country in 1963. Not until 1998 was a fully digital national telecommunication network established connecting all Dzongkhags (districts) and major towns in the country [12]. Information technology has been and still is recognized as an important tool for all developmental activities in Bhutan. "With people at the center for development, Bhutan will harness the benefits of ICT, both as an enabler and as an industry, to realize the Millennium Development Goals and towards enhancing Gross National Happiness" [13].

With the advent of television in 1999 and Internet in 2000 there has been a growing use of IT in both government-run and private organizations. The realization of importance in the education sector shows itself through introduction of a course called "Postgraduate Certificate in Teaching of Information System" for teachers to be trained as IT teachers.

According to Druknet (the national Internet provider in Bhutan) in 2007 there were 6000 dial-up users and 90 organizations having leased-line Internet connectivity and an estimated number of 3000 Internet users in Bhutan. In just 5 years, the number of users has grown to 139,896 [14]. As stated by Bon based on an African study, the following can be said to be true for Bhutan as well:

"The increased number of Internet users in the country can be considered a "digital indicator" of the adoption of the ICT society, and the integration into the global networked economy" [15 p. 123].

In summary, we can say that the use of technology in teaching in Bhutan has evolved quickly over a rather short period of time, and by now it has become quite common in larger schools and university colleges. Both teachers and students make use of technologies to enhance teaching and learning (mainly computers and projectors, but also internet, laptops and mobile phones). However, the use of ICT as the main tool for teaching and learning is found mostly in colleges and much less in schools since the former have adequate ICT facilities [16]. The colleges under RUB have started using a VLE (Virtual Learning Environment) to enhance the teaching and learning process. Research on ICT in higher education in Bhutan is yet in its early days, and only a few published studies are available at this time [5] [18] [19]. From these, only [5] tries to describe the current state of use. The study reported on in this paper complements existing work by focusing on the teachers' use and their perceptions, whereas earlier work has been either more general or student-focused.

2 LITERATURE REVIEW

In the following section we discuss central conceptions for this study, namely ICT, pedagogy, motivation and attitude which have all influenced the way we have framed the survey and interviews.

2.1 The need for ICT in teaching

According to Pelgrum & Law [19], Information and Communication Technology was first termed by the United Nations in 1992, and is used to connote 'internet service', media, 'telecommunication' and 'network-based information services'. ICT is mainly used for enhancing communication. However, the use of ICT has found its way towards other fields of work amongst which education is one. Hepp et al. [20] state that ICT has to be applied in education as "new society requires new skills". This point is also made in a series of recent publications addressing the so called 21st Century skills (see [21] for a comparison of descriptions of skills). Furthermore, Hepp et al. point out that there should be "...a quest for quality learning for which the schools should profoundly revise present teaching-practices and resources to create more effective learning environments..." A number of reports present studies of lessons learned about ICT and teaching in the third world [20] [19] [18], and some recommendations are offered for policy-makers. However, as is also stated by Hepp et al., "there is no universal truth when it comes to applying ICT in education, and that there is no advice that can be directly applied without considering each country's reality, priorities and long-term budgetary prospects and commitment". [20 p.V]. For the purpose of our research, however, we have tried to combine experiences and knowledge from both studies of the situation in developing and in developed countries. Thus, it becomes clear that some of the critical issues in integration of ICT into teaching and learning practices are the same in different parts of the world. At RUB, the use of ICT as a tool to improve learning began in the year 2004 when ICT was first utilised to support distance education programmes in SCE (previously known as The National Institute of Education) [5 p.149]. Gradually the VLE Moodle was implemented and at present use of the VLE is gaining popularity. Resulting from staff training in ICT, teachers are now moving towards integration of ICT in their teaching practices.

2.2 Challenges in integrating ICT with pedagogy

Several authors express the view that ICT can improve education in general (e.g. Dawes 2001 in [22]). How to achieve expected improvements are dealt with by many researchers and practitioners alike. In his paper on integration of ICT into teaching, Wang says: "Numerous design models are currently available to help teachers integrate ICT..." into their teaching practices. Dawes gives the examples of frameworks such as ASSURE (Analyse learners; State objectives; Select media and materials; Utilise media and materials; Require learner participation; Evaluate and revise) and ICARE (Introduce; Connect; Apply; Reflect; Extend) (ibid. p. 411). Wang also provides a generic model of ICT integration in which 'Pedagogy', 'Technology' and 'Social interaction' form three components. These three components form a triangle to show their inter-relationship and the support they can provide for each other.

However, studies of the practice in schools and universities in different parts of the world have shown that integration of ICT is a complex and demanding process. To describe and conceptualise what is required from teaching professionals in the 21st century, the concept of Technological Pedagogical Content Knowledge (TPACK) has been developed [24] [25]. The concept is widely used by researchers, practitioners and policy makers to describe and discuss the forms of knowledge required for use and integration of ICT in teaching practices. In TPACK, the three overlapping elements Content, Pedagogy, and Technology, lead to four forms of knowledge, which need to be understood as both interrelated and context-dependent. Good teaching with ICT requires an understanding of how technology relates to pedagogy and content, and how the introduction of technology alters both content and form.

2.3 Development of teachers' competences for using ICT

The process of ICT integration is a complex one, and many sources can be found which add to the understanding of this. The importance of having the right skills are mentioned by Wang: "Effective integration of ICT into teaching and learning is becoming an essential competency for teachers" ([17] p.411). This is supported by Almadhour who states that, "Having ICT in education does not automatically ensure that high quality effective teaching and learning will take place, the teachers' role is all important here in terms of perspective and skills" ([26] p.6). In a study conducted in African Universities, it was revealed that lecturers did not use ICT for instructional purpose as they lacked the relevant skills and knowledge ([27] p.819).

To identify what skills and form of competence development are needed to further the integration of ICT into the teaching within an institution, a clear understanding of the approach to development of ICT-based teaching is needed. We shall shortly mention three main paradigms here, which we believe

will have different organisational impact and consequences: *Instructional design*, *curriculum development*, and *learning design*. Very briefly, instructional design is characterized by the use of experts in content, pedagogy and technology, which means that the instructional design process does not necessarily involve the teachers at the institution in question (for an introduction to instructional design, see [28]). Curriculum development (at least in the American tradition as described in [29]) is often associated with a managerial approach to development of teaching, meaning that planning of the specific activities, implementation of curriculum, development of tests, etc., all follow from a larger (often national) framework for educational system in question. Again, this means that the room for influence from teachers in specific institutions is very limited. Both instructional design and curriculum development most often entail working within a given framework, set requirements for content, etc., and thus leave little room for teachers at a given institution to define the core elements in their own teaching. Although there are clear advantages in a centrally developed approach, there is also a loss of freedom for teachers, and there is a missed opportunity for capacity building at the institutional level when it comes to designing teaching with ICT. The tradition of learning design has at its centre the competent teacher who defines the core elements in teaching in the local context [30]. Furthermore, learning design focuses explicitly on ways to design for learning with ICT, which means that core dimensions in this approach are technology integration; competence development; and the students' learning as opposed to the teacher's teaching.

In order to effectively influence the development of ICT-based teaching and learning, institutions need to have faculty who is competent in this regard. It is suggested by BECTA [31] that teachers receive pedagogical training rather than training on use of ICT tools, which is supported by Gomes who claims that the obstacles of the use of ICT has been the "lack of training in digital literacy and lack of pedagogic training (cited in. [22] p.239). Balanskat et al. state that professional development to be provided to teachers should address their 'learning needs' (ibid. p.240).

The question of how to build this competence is the heart of the matter, and the research project at RUB also attaches great importance to this. In this paper we will not deal with this matter in any further detail, however, it is worth noticing that in the focus group interview at SCE a teacher made the following statement: "I would like to make a suggestion that now we are livening in the technological world we have to keep up with what is happening I would suggest that the college could look into upgrading in terms of human resource as well as hardware" (T7)

2.4 The importance of access to resources and support

The question of access to necessary resources is of particular interest for developing countries, which becomes clear in a number of studies. One is an analysis of pre-service teacher education in Zimbabwe, where the authors found that 'narrow bandwidth', 'slow internet speed', 'slow dial-up' and 'limited access' were the major constraints faced by lecturers ([27] p.822). The study also pointed out that at the time of the study, none of the African Universities had 'adequate bandwidth' (ibid. p.810). Donnelly et al. [32] describes that there are two orders of barriers for successful integration of ICT. The first order barriers are referred to as missing or inadequate resources such as equipment, training and support. The second order barrier is the teacher's core belief on the use of ICT. Kox et al. found that the majority of teachers expressed that "insufficient ICT resources in the school [prevented] teachers using ICT" (cited in [22] p.241).

At this time, we will not discuss this matter any further. It is clear that this issue of resources is important in Bhutan as well. However, the general approach to our work at RUB is to look for both constraints and enablers, and on field trips to a number of colleges in the autumn 2012, we have identified several interesting uses of ICT for teaching and other work at the colleges. Presentation of those findings will be done in future work.

2.5 Attitude and motivation

So far, we have looked at the challenges of integrating ICT in teaching, and have discussed conceptual models, competences, and access to resources and support. A fourth important aspect is handling the process of change related to integrating ICT into existing teaching practices. Fullan talks about personal motivation as key to change [33], and explains it like this: "Educational change is dependent on "what teachers do and think - it's as simple and as complex as that" ([33] p.129). In order to bring changes in the teaching using ICT, for that matter any change, the attitudes and motivation level of the involved teachers will make a difference. If the teachers have a negative attitude towards change, they would not readily welcome the change. Hence as stated in the report

from Becta: “One key area of teacher’s attitude towards the use of technologies is their understanding of whether these technologies will benefit their teaching and their students’ learning, ([31] p.238), the teachers have to be made aware of., Also, as mentioned by Donnelly et al. there are three key important elements of teachers’ attitude to innovation, namely what they call: *Human infrastructure* (organizational preparation to support technology-integration in the classroom), *technological infrastructure* (availability of resources), and *social support* (peers supporting or discouraging). If adequate resource and technological support are not available, teachers would not get motivated.

3 METHODOLOGY

This study explores the status of ICT use for teaching by the college faculty. The study applies both quantitative and qualitative methods. Quantitative data were collected through the use of survey questionnaires. The questions in the survey were informed by our literature study. Through the questionnaire we collected data on the lecturers’ demography; their level of ICT knowledge and skills; the ways in which they use ICT;, their attitude towards using ICT for teaching; and factors they believe to impact on the use of ICT for teaching at SCE. From a total of 58 lecturers, 32 responded to the survey. Participation was purely voluntary.

To collect qualitative data, a semi-structured focus group interview was conducted with six lecturers and the VLE coordinator of the college as participants. The interviewees were selected in consideration of gender representation and seniority in the college. Before the start of the interview, the participants were briefed on the purpose of the interview, and a general consensus was drawn on the use of video to record the interview.

The survey questions were inspired by an Australian study of teachers’ ICT skills [34] and the following themes were addressed in the questionnaire:

- Demographics
- Attitudes and motivation
- Personal use
- Professional use
- Use of VLE
- Skills and competence
- Professional development
- Access to Internet
- Knowledge about other forms of online learning

Also the interview questions were formulated with inspiration from these themes. For analysis of the quantitative data the Statistical Package for Social Sciences (SPSS) program was used. For the qualitative data we have carried out thematic content analysis to establish perspectives of various views and attitudes towards the topics in question.

4 DATA ANALYSIS AND INTERPRETATION

Demographics and training: From a total of 58 lecturers, 32 participated in the survey of which 24 were male and 8 female respondents. The respondents’ age ranged from 25 to 60 years. 41% of the respondents have been working at SCE for 13 years and a few (6%) have worked there for more than 20 years. Very few of the participants have attained Masters/Diploma/Certificate in ICT (3 %), while a majority (66%) of the respondents have attended VLE and Moodle training at SCE and some training on ICT in the college. 9% of the respondents have participated in training abroad, and 13% indicated they had participated in training in Bhutan, but outside the college. 53% of the respondents reported that they have attended training related to ICT like VLE, E-governance within the college in the last two years.

Motivation and attitude: To get a picture of the motivation and attitude of the participants, we asked for their opinion on a number of statements regarding use of ICT in teaching and learning. The statements were the following:

- the development in ICT must result in a change in curriculum and pedagogy
- integrating ICT has enabled me to deliver my lesson more effectively
- teachers of today need to be competent in ICT to cope with demands of integrating ICT with content, pedagogy and technology

- student's use of ICT has the capacity to strongly support student-centered learning
- ICT provides valuable resources and tools to support student learning
- I like exploring technology and new software and its possibilities

There was a very strong consensus on these statements. We found that 90-95% of the respondents either agreed or strongly agreed with them.

Familiarity with technology: The survey was carried out to find out what tools the respondents were familiar with and what they use ICT for in their personal and professional lives. We found that 90% of the respondents were familiar with desktop computer, laptop, LCD projector, mobile phone, and television. On accessibility to internet connection 75% of the respondents replied that they have no internet connection at home. Nearly all respondents reported that they are familiar with basic file handling (97%). Most (85%) also know how to install software and how to zip and unzip files. All respondents were familiar with accessing and sending emails (with attachments), and just over 50% know how to add a signature file to their email and how to create an emailing list. Also the basics of internet navigation were known to all respondents (we asked about website navigation, basic information search, and reading news on line). When asked about other use of internet, the numbers were somewhat lower: Watching movies (81%); downloading software (75%): playing games on line (65%); and creating bookmarks (65%). In fig. 1 and fig. 2 below, we show how many of the 32 respondents regularly used a number of specific tools for personal and teaching purposes respectively.

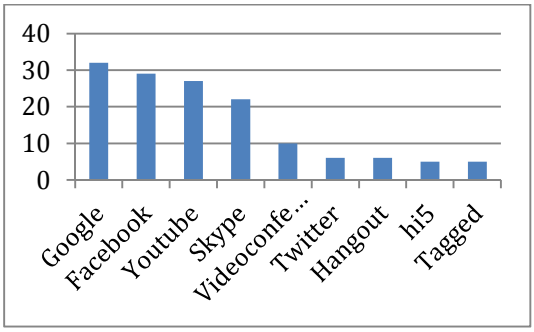

Figure1: Tools used for personal purposes

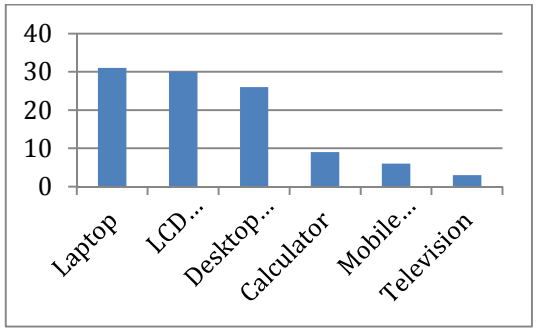

Figure 2: Tools used regularly for teaching

Additional questions regarding the variety and frequency in the use of technology for teaching purposes show that between 50 and 60% use ICT on a daily basis (specifically for creation of materials, communication with students and colleagues, distribution of information to students, and information search).In two cases only were the numbers for weekly use higher than those for daily use, namely in the cases of curriculum administration (planning, monitoring, evaluation and reporting) and professional learning. Less than 5% of the respondents indicated that they never use technology for the purposes mentioned in the survey. 90% of the respondents responded that the reason for using the above listed technologies for teaching are because it motivates student learning, it is easier and comfortable, and materials are readily available in the college.

Online teaching, purpose and frequency: 68% of the participants responded that they use blended (face-face and online) teaching. 31% of the participants responded that use purely face-face teaching.

How to increase use of ICT in teaching: When asked to state factors that would increase their use of ICT in teaching, the majority of respondents mention the requirement of stable and high speed of internet service available in the college, and most respondents also point to the provision of a desktop computer and LCD projector in every classroom. A few respondents mention basic ICT courses on instructional design and efficient ICT support as a necessity to enhance the use of ICT in teaching.

5 DISCUSSION

5.1 Benefits of ICT integration in teaching

The baseline study presented above indicates that teachers experience some benefits from integrating ICT into their teaching. 90% of the respondents give the following as reasons for using technologies for teaching: It motivates student learning; it is easier and more comfortable; and materials are readily available in the college. In the interview, one teacher says: "It adds variety", and it brings changes in

the “mode of teaching” (T1). The survey reveals that online teaching as well as face to face teaching with the use of ICT takes place in the college. A variety of activities are carried out in the classroom with ICT. In the interview, teachers gave examples of what they have been doing to create variation in their teaching methods. They mention ‘simulation, use of animations (T1 and T3), movie-making and developing CDs with materials for future learning.

One other benefit mentioned by some teachers is the saving of time. One teacher talked about how teaching would be more efficient with the use of powerpoint rather than writing on the blackboard. The use of the VLE also offers some advantages, the participants said. Teachers can upload resources for students, and one teacher mentions that the VLE allows the lecturer to ‘do distance learning’ (T1). This is useful in SCE, since faculty often have to leave the town of Samtse for meetings in the capital or teaching obligations in other colleges across the country. Interaction with students can then be carried out online.

Many of the actions necessary (but not sufficient) for learning are thus carried out more smoothly with the use of ICT, such as production, modification and distribution of teaching materials. These are 'basic blocks' that are used regardless of whether the pedagogy is based on lectures or on a 'post-lecture' paradigm.

5.2 Constraints of ICT integration

Though teachers in the interview highlight various benefits they get from using ICT in their teaching, they also identify some obstacles for further use. The major obstacle, teachers face appears to be Internet connectivity and Internet speed. When asked to state factors that would increase their use of ICT in teaching (in the survey), the majority of respondents mention stable high speed internet. It is seen to be more important to have this at the college than at home. One teacher mentions in the interview that ‘Internet is very slow’ and ‘sometimes it is not there’ (T4), which means there is no connectivity. From the remarks made by teachers on the speed of internet, we can generalise that there is a lot of frustration about the irregular and slow internet connection at the college. This causes practical problems for the teachers wishing to use Internet-based resources in their teaching, and makes their preparation work very time consuming. One teacher says: “I stayed till 7.30 pm to log it but still I could not do it” (T4), and another teacher recommends that the college bandwidth is increased. He says: “The problem is that to download even small files takes lot of time. And out of frustration they (meaning teachers) just give up.” (T1)

Lack of skills is another obstacle faced by the teachers. One participant in the interview points out the inability of finding appropriate resources from the internet: “When we visit some website it is quite difficult to get the required resources. Thies is a challenge” (T5). Another teacher says, “When we use our personal computers to show a powerpoint on the projector and something happens like a virus… I think we need to update virus control and the college should do something about it. My laptop crashed recently” (T2). Teachers appear to be lacking in terms of computer skills, and also skills of navigating and locating appropriate resources. Even though the survey shows that over 50% of the respondents have received ICT-training in the college, it seems they do not have the skills to solve problems they face in their everyday use of ICT in their work.

Restriction in resources is another problem teachers face. The word resource in the present context refers to ICT tools, including internet, mobile, LCD, etc. One teacher says: “When we have to use ICT the resource constraint is there. We have to literally go around looking for LCD projectors so at times we come to chalk and board (in the classroom)” (T1). Another participant in the interview has the point of view that when resources are lacking, it affect commitment. She says: “That is how it works, without resources we cannot do much with our commitment” (T6).

6 CONCLUSION

This study reveals that the lecturers in the college have experienced benefits as well as constraints when using ICT in their teaching. Despite taking part in training, lecturers still face inadequacy in the skills they possess. This shows the further need of practice and use of ICT skills. Perhaps more importantly, this gives cause for consideration of whether the teaching staff is offered the right kind of training, something to be explored more in future research and planned interventions. The study also shows that lecturers use a variety of ICT tools in their teaching. In addition, there are several indications from both the survey and the interview that at least some teachers would like to do more, if the resources were available. Stability and speed in the Internet-connection, and support at hand

seem to be the most crucial issues. However, lecturers face resource constraints in terms of inadequate expertise support (as there is no IT expert in the college). The low bandwidth of internet is also a major constraint.

These results are not surprising in a college in a country with such gross national income per capita as is the case in Bhutan. Yet these research results are relevant for all researchers, professionals, and policy-makers that deal with the educational technology of Bhutan. Previously, the actual situation in Bhutan was unknown and we were left guessing whether it mimicked other countries. Taking Bhutan's several special circumstances (political, demographical, historical) into account, such inference is highly speculative. This also includes regional meta-studies that sometimes skip Bhutan and, although the data of Bhutan are not that deviating, will nevertheless always be supposed to behave like the dominant actors of the region.

This study is preliminary as its data are only from one of Bhutan's colleges and it would also pave way for a similar study at other institutions of RUB. Bhutan in its smallness can be constituted a micro-cosmos. Although the data cover one college only, it captures the attitudes of most of the colleges at RUB. Furthermore, changes at only one college will create changes on a national level that would be very costly to experiment with in other countries.

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