World Academy of Science, Engineering and Technology
International Journal of Information and Communication Engineering
Vol:8, No:8, 2014

Technology for Enhancing the Learning and Teaching Experience in Higher Education

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Open Science Index, Information and Communication Engineering Vol:8, No:8, 2014 publications.waset.org/9998989/pdf

***Abstract*—**The rapid development and growth of technology has changed the method of obtaining information for educators and learners. Technology has created a new world of collaboration and communication among people. Incorporating new technology into the teaching process can enhance learning outcomes. Billions of individuals across the world are now connected together, and are cooperating and contributing their knowledge and intelligence. Time is no longer wasted in waiting until the teacher is ready to share information as learners can go online and get it immediatelt.

The objectives of this paper are to understand the reasons why changes in teaching and learning methods are necessary, to find ways of improving them, and to investigate the challenges that present themselves in the adoption of new ICT tools in higher education institutes.

To achieve these objectives two primary research methods were used: questionnaires, which were distributed among students at higher educational institutes and multiple interviews with faculty members (teachers) from different colleges and universities, which were conducted to find out why teaching and learning methodology should change.

The findings show that both learners and educators agree that educational technology plays a significant role in enhancing instructors' teaching style and students' overall learning experience; however, time constraints, privacy issues, and not being provided with enough up-to-date technology do create some challenges.

***Keywords*—**E-books, educational technology, educators, e-learning, learners, social media, Web 2.0, LMS.

I. Introduction

THE development of educational technology is an essential key driver for educational growth, and has changed the ways of teaching and learning and acquiring knowledge and information. The process of innovation must, however, be supported by a set of methodologies and effectively applied actions [1]. The development of modern technologies has therefore encouraged many people to research innovative ways of improving education in parallel with the advances in technology. The integration of technology into education is becoming a widespread phenomenon throughout the world [2].

In a globalized economy, for instance, the success of any country depends mainly on the educational level of its population. As a country's technology develops, more and more highly skilled people will be needed to use and maintain the technology. However, the curricula of some educational institutions are more likely to emphasize the accumulation of knowledge rather than its application, and the frameworks of several higher education institutes fail to train students and teachers sufficiently in the use and implementation of digital technology in their learning and teaching methodologies. The improvement of education is essential and critical in providing educators and learners with what are generally called '21st century skills'. Thus, governments should work effectively in order to guarantee that all citizens at all levels receive enough technological training to be a participant in the modern world [3].

This research aims to study the issues that have arisen that necessitate changing the education methodologies and the role technology plays in this their evolution. The main objectives of this paper are to understand what necessitates these changes in teaching and learning styles, to find ways of improving teaching and learning processes and to overcome the challenges encountered in adopting new ICT tools in higher education institutes.

The following section in this paper provides an account of the existing literature and related research, followed by a description of the research methodologies employed to achieve the objectives of the research. The research findings are then highlighted and discussed thoroughly. Finally, there are some concluding remarks, limitations of the research, future expectations and research contributions in terms of using the technology for enhancing the learning and teaching experience in higher education.

II. Literature Review

A. Benefits of Educational Technology

Technology has already become fully integrated into students' lives and is becoming crucial in teaching and learning processes [4]. Teachers in many parts of the world are now expected to incorporate technology into their teaching methodologies. This is due to the importance of using technology in education because it may help to develop the capabilities and skills of both students and teachers [5].

The main reasons for using technology in education are to support learners and teachers to find ways of meeting their desire for interpersonal relationships and connections, and to find approaches that acknowledge individual differences, thus satisfying a diversity of learner and teacher needs, abilities, and interests, as computer technology allows for flexibility in studying and teaching. In addition, taking online courses, for example, can enhance a student's computer skills as well as their proficiency in using software applications. Furthermore, educational technology may play a role in changing the teacher position from educator to facilitator. Likewise,

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Open Science Index, Information and Communication Engineering Vol:8, No:8, 2014 publications.waset.org/9998989/pdf

technology can allow students and teachers to share course material easily and stimulate a smooth environment of collaboration and teamwork [6].

Another benefit of employing technology in learning and teaching is that it encourages the adoption of better attitudes towards these two processes. Much of the research that has been conducted regarding the use of technology in education tends to support the positive correlation between the use of technology in education and a more positive attitude towards it. Moreover, using laptops or tablets during lectures or while doing homework can provide both students and teachers with immediate feedback which can consequently lead to reductions in learning time. Such fast feedback from instructors will provide students with a sense of achievement as well as teachers, who will benefit by being able to answer more easily whatever questions come into students' minds at any time. One of the greatest benefits in the adoption of technology in education is its role in preparing students for the future. This is because the upcoming workplace will require students to have technological skills and capabilities in terms of using different software, spreadsheets and so on. By investing in technology in educational institutions students will be able to gain the skills needed for market requirements in the future [5].

Finally, according to a press release by Larson, E., (2013) on the Public Broadcasting Service, almost 74% of all teachers who were surveyed said that they used technology resources in education (e.g., tablets and computers) for expanding and supporting the course contents in classrooms Likewise, 74% of them believed that they could motivate students to learn more by adopting such technologies. Moreover, 73% stated that educational technology provided them with a variation in learning and teaching methodologies. Finally, 65% mentioned that the effective utilization of technology could demonstrate something that could not be explained in any other way [7].

B. Changes in Teaching and Learning Methodologies

The issues that have arisen that necessitate changing the education methodologies are diverse and substantial. Experts believe that technology will be a significant factor in influencing the change in teaching and learning methodologies. As demographics are changing and expectations are shifting, the learning atmosphere requires educational institutions to observe new practices in teaching and learning methodologies. For instance, many students believe that the use of educational technologies in their courses may improve their understanding and learning. However, after graduation, they report that the current educational technologies they used during their studies have not sufficiently prepared them for the workplace. Therefore education, both in terms of teaching and learning, should be improved so that graduates become aligned with workplace requirements [8]. There are several factors in particular that might influence the way teaching and learning processes are practiced, and they will be discussed below.

1. Advancement in IT and Web 2.0

Nowadays people are living in the information age, where the rapid advancement of technology has changed the way the world operates. Technology now lets people communicate from the opposite ends of the world [9]. Consequently, this forces people to think very hard about the existing links possible between technological development and teaching and learning styles [1]. Moreover, the development of Web 2.0 makes it a useful tool for teaching and learning. For instance, any educational practice that concerns the playful, expressive, reflective or exploratory aspects of knowledge-building is likely to find Web 2.0 a useful resource [8].

2. Availability of Fast Internet Connection

The required technology can be easily installed in educational institutions wherever and a fast internet connection is available. Many countries are investing in e-learning and implementing different technologies in education. For instance, all schools in South Korea are connected to the internet with high-speed connections, all teachers are given training in e-learning and, by 2016 almost all of the printed textbooks will be replaced by electronic ones. Therefore, in order to provide students with the necessary skills to compete, it is important to provide them with access to a high quality and fast internet connection [10]

3. The Engagement of Young People in the Use of Social Media and Smartphones

Every day around 250 million people log in to Facebook. Twitter has about 15 million regular users. Two billion video clips are watched each day on YouTube. Hourly users upload an average of 24 hours of video content. Each day more than 90 percent of college students visit different social networking sites [11]. Social media have experienced a hasty increase in users among students and teachers [12], and current and upcoming generations of learners and educators are considered to be 'digital natives' who have grown up in the technological environment of laptops, smartphones and heavy dependence on social media. They have distinct expectations of education that involve learning and teaching methodologies that are accessible on demand at any time and in any place [8]. Social media sites such as Facebook, Twitter, and YouTube are examples of tools that are used frequently to share educational materials [13]. The significant aspect of these tools is that they involve broader participation in the creation of information and they enable communication and networking among groups (e.g., students and teachers) from different places across the globe. Additionally, using tools like blogs, wikis and YouTube enable the sharing of information, images and videos. Although these and many other tools are increasing interest in education, they need to be well structured and implemented effectively through educational activities and course materials [14]. Apparently, social media sites are changing the nature of the student/ teacher relationship through knowledge and information. The idea is that teaching and learning through social media now rest on the ability to access and use any information needed on a 'just-in-time' basis [15].

Open Science Index, Information and Communication Engineering Vol:8, No:8, 2014 publications.waset.org/9998989/pdf

C. Ways to Improve Teaching and Learning Styles

The use of technology in classrooms is growing rapidly beyond computers and laptops. This is due to the need for improving students' learning experience and educators' methods of teaching. Therefore, several procedures need to be implemented so as to improve the style of teaching and learning methodologies in educational institutions [16]. These procedures are outlined below:

1. The Use of e-Books

The use of e-books in education is increasing tremendously due to the significant decrease in the price of e-books and also because the devices have become an affordable alternative to iPads and laptops. Both the accessibility and affordability of e-books for students have increased rapidly, so that teachers and students have endless alternatives to choose from. Moreover, e-books are generally considered to be free, or less expensive than print copies, and they do not wear out as quickly as a printed copy. A further advantage is the immediate access. For instance, e-books can be downloaded in a matter of minutes, can be viewed instantly, whichever page is required, and can be easily stored and shared. Furthermore, the greatest advantage of e-books is the ability of readers to customize their reading experience by adjusting the font size and page layout to suit themselves, and having the use of the available tools and features such as the built-in dictionary, highlighter, and digital notes [16]. Essential changes in the way teachers teach and students learn are proceeding. Some schools and colleges across the world stopped using textbooks and replaced them with modern technological devices. Students prefer to watch online lectures and many of them moved towards more of collaborative study in the traditional classrooms. Today 78% of US students and 83% of faculty (teachers) bring their personal devices to class and use the campus network for internet access [10].

2. The Use of Social Media and Learning Management Systems (LMS)

Over the years, social networking sites shared by students and educators have become more and more widespread. It is one possible way of connecting with friends outside school. Social networking sites like Facebook, YouTube, Twitter, blogs and MySpace are becoming common educational tools among students and teachers. Almost 85% of undergraduate students are considered to be Facebook users. These numbers are anticipated to grow further since the number of new members continues to grow rapidly and this is not only true for Facebook. Numbers of YouTube users closely follow the same trend [17]. Many have mentioned the educational benefits of these social media sites. They play a significant role in encouraging students and teachers to express and share their creative ideas and knowledge. Such personal interactions can help students in developing their leadership skills, from low-level planning and organizing to activities that stimulate social change and democratic engagement [18].

The term 'e-Learning' can actually cover a multiplicity of applications. It is considered to be an umbrella that describes several styles of learning and teaching that rely on up-to-date information and communication technologies. Moreover, it is a great tool for enhancing competency and improving capability, speed, and performance in many areas. On the other hand, e-Learning cannot be implemented without a supporting technology. It could become very successful if it was well managed, thereby eliminating some of the main disadvantages of earlier distance learning programmes [19]. E-learning tools are now available to everyone for use in education. They can provide training and education to large numbers of students and teachers from different backgrounds and with different educational levels. On the other hand, there is a possibility that e-learning may fail in education if people start overestimating what it can actually do. Some people do not understand the limitations of e-learning and may expect too much [20]. Therefore, if e-learning is well presented and explained then many benefits will appear for both students and teachers; for example: flexibility; accessibility; convenience; easy of updating; time saving; highly customizable; greatly interactive, facilitating the participation of both students and educators; presents a simpler way of managing the data; provides access to assessment procedures and testing facilities [19]. One example on LMS is Moodle, a project that is designed to support a social agenda of education. The design and development of Moodle is mainly based on an educational philosophy called 'social constructionist pedagogy' and is considered to be one of the leading online social networks that focus on education. Such systems are highly attractive, technologically advanced and provide most of the functionality necessary for students and teachers [21].

3. Training Teachers in Using the Latest Technology

Teachers are encouraged to incorporate and apply technology into their teaching plans. Many educators believe that technology has improved students' method of learning. However, the problem is that not every teacher is well trained in the use of such technologies. According to a survey that was conducted by the National Center for Education Statistics (NCES) in the USA, around 99% of teachers had access to computers or the internet somewhere in their schools, but not all the teachers were adopting these technologies in their classrooms. This because integrating technology into classrooms depends on the teachers' willingness to use it. If teachers do not feel comfortable with using such technology they will be less motivated to include it into their plans. Only one-third of teachers are able and well prepared to use technology in their teaching, as is also mentioned in the NCES survey. Moreover, teachers with the least number of years of experience were more likely to use educational technology or the internet at home to gather information and material needed for teaching purposes (76%) than teachers with the most number of years of experience (63%). Furthermore, 93% of teachers revealed that independent learning is the most frequent way of preparing them to use technology in teaching, followed by 88% who thought that professional development activities were more important and 87% who relied on their colleagues to learn [22].

Open Science Index, Information and Communication Engineering Vol:8, No:8, 2014 publications.waset.org/9998989/pdf

Many teachers aim to use educational technology effectively but they lack the conceptual framework, time, computer access and the support necessary to do so. If teachers are to use technology effectively and efficiency, a well-structured strategic plan and advanced programmes based on a theoretical model and linked to curricular aims, including creative assessment activities, and which is sustained by adequate financial and staff support, are needed in order to improve students' learning.

A guarantee for teachers that they can obtain the knowledge and skills needed for the effective use of newly emerging technologies could open the door to innovative educational opportunities for both teachers and students. Consequently, those teachers who support the use of technology in education and obtain the skills to employ it effectively should be given priority of access to the resources they deserve and need [11].

Moreover, technical support is significant in the successful integration of education technology. Policies could be adopted and resources provided that would be effective and sustainable but for this to work there must be a broad understanding and knowledge of the use of such technology in education. Furthermore, the operation, installation, and maintenance network must be treated as part of the incorporation of new technology into the education system [23].

4. Providing Educational Institutes with the Latest Educational Technology

Providing educational institutes with the latest educational technology can be a complex process that needs to be well planned and fully conceptualized [23]. For instance, it is very common to provide school classrooms with SMART boards, which are a combination of white boards used with a projector, and deliver at least one computer with a high-speed internet connection per classroom [24]. However, this is not the case in many educational institutions in developing countries as most of them have introduced the integration process without clear plans to guide the way. The strategic plans should be well-defined in order to provide a structured enhancement and implementation for particular educational technology projects. Multiple aspects should be taken into consideration, such as the infrastructure of the technology needed, skill levels in the educational institution, and the efficiency of the academic management process such as the development of the curriculum and the availability of technicians to carry out new technological improvements. It is important for all teachers and students to be aware of the technologies available in their institutions and be able to use them effectively and efficiently [23]. An example of adopting effective technology in educational learning and teaching are iPads/tablets, which have the ability to aid students in establishing more valuable learning practices and encouraging just-in-time learning. Similar to many other modern media technologies, an iPad could also be utilized as a device to support learning and teaching methodologies [25].

D.Challenges in Adopting What is Needed in Education Systems

While it is neither easy nor inexpensive to design and implement professional teacher development programmes in the use of new technologies, it is a critical element of any initiative to introduce technology into educational institutions. Failure to invest sufficient resources in training teachers will result in failure of institutionally-based technology initiatives. This would result in substantial wasted investment, which few, if any, developing countries can afford. Success in ensuring that teachers acquire the skills and knowledge they need to use the technology effectively opens the door to all kinds of new educational opportunities for both teachers and students. Accordingly, teachers' professional development in the use and application of technology must be given priority and the resources it needs, while still maintaining a constructively critical eye on its costs, methodologies and impact [11].

Despite of the achievements revealed by some of the educational institutions across the world in term of adopting several technological tools for teaching and learning processes, many other higher educational institutions still face substantial difficulties in undertaking such an endeavour [23]. Many researchers have been studying why there is some reluctance and lack of passion about using technology. Therefore, the numerous challenges for adopting new ICT tools in higher education institutes will be outlined below [26]:

1. Organization-Related Challenges

There are several challenges that may face organizations when integrating technology into education; for instance, weak IT infrastructure in schools and higher educational institutions, lack of technical support and the unbearable cost of software and hardware licensing. These are discussed below:

Weak IT Infrastructure in Schools and Higher Educational Institutions:

Regardless of the level of educators' and learners' interest, as long as there is inadequate access to hardware and software at the required times or not enough high quality software, one can assume that high standards of practice in such technologies will not be achieved. In addition, existing software is not satisfying enough learners' and educators' needs. Teachers normally regard such software as being educationally weak or inappropriate and not worth the effort of using.

Lack of Technical Support:

Technical support is an essential component when fostering educational technology as teachers will normally need some help when they use such equipment in classrooms. This is due to the fact that most of the time they do not have the skills to overcome any technical difficulties that may occur during teaching. Moreover, teachers claim that sometimes the academic directors provide support that needs more use of software that requires critical thinking skills, and greater adoption of computers in academic activities. This includes issues like installation, operation, maintenance, network

Open Science Index, Information and Communication Engineering Vol:8, No:8, 2014 publications.waset.org/9998989/pdf

administration and security. In most cases however, technical support is not available, which implies that trainers and students require some basic troubleshooting skills to overcome technical problems when using technology [23].

Unbearable Cost of Software and Hardware Licensing:

Financial resources are also a key factor in the successful integration of technology in education. It is clear that countries with greater financial resources have a better chance of reaping the possible benefits offered by technologies than those with limited resources [23].

2. Educators Related Challenges

Students who belong to the digital generation normally expect their education to be relevant to the real world. They want it to be exciting and interesting. Thus educators face some challenges in continuing to 'broadcast' lectures as well as using 'conversational' social software-supported methods to encourage students. Teachers may find it difficult to determine the role the tools can play and how they can be effectively employed. Furthermore, designing assessment can be totally challenging in terms of counting the number of comments on a blog, for instance, which may not be an effective measure of a student's performance if the comments are not clear and succinct. Thus the role of an educator could therefore become more that of a facilitator when social software tools are to be implemented. This perception might be in conflict with that of the teachers who may still see their role as delivering education as well as instruction [26].

Lack of Awareness of What Is Available to Help in Teaching and Learning:

Many teachers lack the knowledge of the classroom best practices available due to their workload and lack of resources. A vision needs to be delivered to teachers so as to give them a clear idea of what educational technology looks like, and also the possibility of experiencing different methods of teaching. Teachers need more opportunities to observe their peers working with technology. Additionally, administrators may not provide teachers with enough administrative support in terms of directions about the use of educational technology, the essential hardware and software required and the incentives that may motivate them to continue integrating technology into education.

A possible solution to overcome such problems and increase the technology usage in educational institutions is to train administrators better so that their attitudes towards technology are enhanced, enabling them to provide teachers with the help needed to integrate technology usage into their lectures.

Also, there are a substantial number of teachers who have very little experience in educational technology, which might be the reason behind their concerns regarding the use of technology in the classroom. Furthermore, the modern computer applications require new capabilities and knowledge; if they do not acquire these teachers will fail to adopt such technologies in classrooms. Teachers need to be well-trained by attending seminars, workshops, courses and other training venues. The reason behind the lack of awareness of educational technology is because teachers and students do not have sufficient exposure to modern technology. This is due to the fact that many educational institutions have not yet adopted technology in their lectures.

Teachers Resistant to Using Technology:

Many educators believe that computers are complicated machines to be used only during lectures. Similarly, they think it is just a temporary issue within the current schooling system rather than a beneficial trend. Educators' beliefs and experience with schooling prevent them from taking instructional risks and applying technology in the classrooms. They show resistance to educational change in situations where they could use educational technology.

3. Student-Related Challenges

As students usually work in groups and contribute collaboratively in spaces such as social media sites, there are always concerns about everyone not contributing equally. Hence, there are concerns about the ownership of the resulting work and who actually did it. Additionally, students will not always benefit from the collaborative activity if some students do not contribute sufficiently. Moreover, some students are not always connected to the internet or may not be able to acquire the electronic devices needed in order to participate in the technological environment [26].

III. Research Methodology

The effective integration of technology into education has been an important objective in many educational institutes worldwide. Educational development is essential in order to provide teachers and learners with the required skills and competencies and to make them aware of the possible evolution in education associated with the emerging technologies. Therefore, this paper aims to identify the reasons that necessitate changes in teaching and learning styles and to find ways of improving teaching and learning processes and of adopting new ICT tools in higher education institutes.

In order, to investigate why teaching and learning methodology should change, two main methods were used; an interview with students and teachers from different colleges and universities across Oman, and a questionnaire distributed among them.

1. Questionnaire: Questionnaires were distributed amongst students from different levels at higher educational institutes to measure their attitudes and beliefs about changing learning methodology (n=160).
2. Interview: Multiple interviews were conducted with teachers and IT experts from different colleges and universities in order to provide more in-depth information and opportunities for a follow-up for further clarification. The goal was to interview participants who represented a range of different positions and who came from different colleges and universities. Questions asked, for example, were "What are the reasons that necessitate changes in teaching and learning methods?" and "In what ways could

Open Science Index, Information and Communication Engineering Vol:8, No:8, 2014 publications.waset.org/9998989/pdf

teaching and learning methodologies be improved?", and what are the challenges in adopting new ICT tools in higher education institutes?"

IV. Research Findings and Discussion

A. Participants' Profile

An online questionnaire was developed as an instrument for this study and students at different higher education institutes were invited to respond. The questionnaire contained 15 questions grouped into five different sections related to the role of technology in enhancing the learning and teaching experience in higher education. A total of 160 responses were recorded. Of the students 46% were males and 54% were females, enrolled in different colleges and universities across Oman.

A total of 76% of the students stated that they use the internet regularly at college or university, 22% use it sometimes and 2% of them did not use it at all. A question regarding the average number of hours spent on internet activities for homework showed that 22% of respondents spend less than 2 hours per week, 34% of them spend 3-4 hours, 23% spend approximately 5-6 hours and 20% of them over 7 hours. A total of 65% of respondents stated that most of their instructors use technology (e.g., Moodle, PowerPoint, social media, etc.) while teaching. Almost 32% mentioned that some of them use it and only 3% stated that none of them use technology in teaching.

Moreover, when asked to rate themselves on different skills, the answers were as follows: using the internet in order to search for information effectively and efficiently - 61% rated themselves as high level users while 38% said that they have an intermediate level and only 1% a low level in using technology. A total of 37% indicated that they are able to evaluate the reliability and credibility of online information whereas many mentioned that they have an intermediate level in doing so (respondent rate = 56%). Only 7% stated that they do not have enough ability to evaluate the reliability and credibility of online information. 36% of the students indicated that they have a high level of understanding regarding the ethical and legal issues surrounding the access to and use of digital information, whereas 56% declared that they had an intermediate level and 8% a low level.

In this study we then obtained a teacher-orientated perspective by conducting an online survey with faculty members from different colleges and universities to find out why teaching and learning methodology should change. A total of 18 instructors were interviewed, 56% being female while 44% were male, from different colleges and universities.

B. Reasons that Necessitate Changes of Teaching & Learning Styles

The first objective of this paper is to investigate the reasons why changes in teaching and learning styles are necessary. As shown in Table I, students who use the internet to find information, understand course material well and prepare home assignments represent 94% of total respondents. Moreover, 86% of total respondents stated that they enjoy using technology while studying and 83% of them mentioned that technology makes learning more convenient. In addition, 80% of respondents stated that they are very confident when it comes to working with technology at college or university. Similarly, 92% of total participants agreed that technology has enhanced their learning. However, 31% of students mentioned that using technology in class takes up too much time and 23% of them stated that they skip classes as course materials are available online.

TABLE I
Reasons that Necessitate Changes of Teaching & Learning Styles-Students' Perspectives

Statement	Agree (%)
I use the internet to find information, understand course material well and prepare home assignments.	94
I enjoy using technology while studying.	86
I think using technology in class takes up too much time.	31
Technology makes learning more convenient.	83
I am very confident when it comes to working with technology at college/university.	80
I skip classes as course materials are available online.	23
Overall, technology has enhanced my learning.	92
Overall, technology has enhanced my learning.	92

An open-ended question was asked about the reasons that necessitate changes in the teaching and learning style. Many students supported the idea of incorporating technology into education as most students nowadays are digital natives and enjoy learning using educational technology. Moreover, the world is adopting information technology very rapidly, which means that people have to adapt to this new trend by improving learning and teaching styles by using technologies in schools and universities. Also, some participants mentioned that attending classes can be quite boring and most students attend only for the sake of attendance as they do not really feel they get enough out of them. Additionally, variations in learning materials can increase the interaction between students and teacher, thus enhancing their experience in the classroom. It could improve the overall grade of the students if the lectures were available online (i.e., Moodle) so that they could be returned to as needed. Some other students disagreed, declaring that in some cases courses would be better if the teaching style was changed but changing the style in others might make it more difficult to learn. For instance, mathematics courses should not be taught using PowerPoint. The instructor should hold a pen and solve problems on the whiteboard.

Similar questions were asked of instructors to find out their opinions concerning changes of teaching and learning styles. A total of 80% of interviewees agreed that students are internet-, social media- and ICT-savvy, which makes it very attractive to use. Also, 60% agreed that students enjoy using the new widgets. Additionally, 60% of young teachers prefer using the latest technology to convey the message as they find it easy, useful and time saving. Likewise, a total of 60% of the interviewees find it useful to use during lectures. Similarly,

Open Science Index, Information and Communication Engineering Vol:8, No:8, 2014 publications.waset.org/9998989/pdf

60% of total participants agreed that as many educational institutes made the use ICT in teaching and learning compulsory, it was therefore necessary to shift. Finally, the entire group of participants agreed that there are massive educational materials available online that can help students in acquainting themselves with endless knowledge and hence, improve they academic performance.

C. Ways to Improve Teaching and Learning Processes

The second objective of this study is to investigate the ways to improve teaching and learning processes. As shown in Table II, students agreed that internet access (wireless) is one of the ways to improve teaching and writing (77%). Moreover, 69% of them mentioned that electronic devices (e.g., desktop computers, laptops, smartphones, tablets, and iPads) can contribute to improvements in the teaching and learning process. A total of 33% respondents mentioned that both social networking sites and e-books can support the improvement of teaching and learning. A total of 43% of students said that LMS can play a role in improving the teaching and learning process, while 47% thought that technical support is the most essential factor in the evolution of this process.

An open-ended question was asked regarding the most effective tools or technologies that could be used to support teaching and learning. The majority of the students indicated that the most effective tools in educational technology are the Learning Management System (i.e., Moodle), YouTube, iPads, smart phones, e-books, social networking sites (i.e., Facebook), overhead projectors, interactive flash, cloud computing to share teaching materials and the interactive whiteboard (IWB).

D. Challenges in the ADOPTION of New ICT Tools in Higher Education Institutes

The third objective of this study is to explore the challenges in adopting the new ICT tools in higher education institutes. As shown in Table III, students mentioned several challenges that might arise in the process of adopting new ICT tools in higher education institutes. One of the most significant is that the internet bandwidth is very low in many areas in Oman (73%). Additionally, a total of 53% of students agreed that there is another serious challenge: that of not having the financial ability to subscribe to internet broadband, which prevents students from jumping on the bandwagon. Moreover, 75% of total students agreed that using the new educational technology requires certain skills (i.e. it is not easy to use). One thing that 34% of the students agreed on is that "the education institutes do not provide enough technical support". Fewer participants (16%) agreed that they do not have enough time to adopt educational technologies in learning. Similarly, 16% mentioned that they are hesitant or not willing to use educational technologies in learning. However, only 8% of students stated that they do not think that using educational technologies in education is useful.

TABLE II
WAYS TO IMPROVE TEACHING AND LEARNING PROCESSES-STUDENTS' PERSPECTIVES

Statement	Essential (%)
Internet access (Wireless)	77
Electronic devices (e.g., desktop computer, laptop, smartphone, tablet, iPad)	69
Social networking sites	33
E-books	33
Learning Management System (LMS)	43
Technical support	47

Similar questions were asked of instructors to discover the challenges for them in adopting new ICT tools in higher education institutes. Many of them (63%) stated that using the new educational technology requires certain skills (i.e. it is not easy to use). Only 12% of them stated that they are hesitant or not willing to use educational technologies in teaching. Some of them (28%) stated that they do not have time to adopt educational technologies in teaching, which creates a substantial obstacle to adopting educational technology. Most of the interviewees (95%) said that they find using educational technologies in education useful. Only 6% claimed that students might misuse such technology during lectures. Regarding the IT infrastructure, 39% said that educational institutes do not provide the necessary technical support, that classrooms are not equipped for such a move (45%) and that the internet bandwidth is low in many areas of Oman (73%). Finally, 28% of total participants attributed important challenges to the financial inability to subscribe to internet broadband, which prevents many students from jumping on the bandwagon, and security and privacy concerns that may limit the use of technology (17%).

V. CONCLUSION

This research highlighted the reasons why changes in teaching and learning are necessary, suggested ways of improving them; furthermore, it revealed the challenges that existed in the adoption of new ICT tools in higher education institutes. The results showed a high percentage of both learners and educators do in fact welcome the idea of incorporating technology into education.

Regarding the reasons that necessitate changes in teaching and learning styles, many students and teachers claim that using technologies enhances their overall performance as well as making it more enjoyable. It also helps them to understand course material better, making learning more convenient and enhancing their overall learning performance. Social networking sites, electronic devices such as desktop computers, laptops, smartphones, tablets, iPads, e-books, the Learning Management System (LMS) and technical support all contribute to the improvement of the learning process.

TABLE III
CHALLENGES FOR ADOPTING NEW ICT TOOLS IN HIGHER EDUCATION INSTITUTES-STUDENTS' PERSPECTIVES

Statement	Agree (%)
Using the new educational technology requires certain skills (i.e. it is not easy to use)	75
I am hesitant (not willing) to use educational technologies in learning	15
I don't have time to adopt educational technologies in learning	16
I don't think that using educational technologies in education is useful	8
The college/university does not provide the necessary technical support	34
Internet bandwidth is low in many areas in Oman	73
Financial inability to subscribe to internet broadband prevents students from jumping on the bandwagon	53

Finally, regarding the challenges of adopting the new ICT tools in higher education institutes, the research findings indicate that what is actually needed is the design of flexible, accessible and appropriate strategies in order to ensure the effective integration of technology into the teaching and learning process. These would be put in place along with the recruitment, training, and retention of the required staff. Additionally, education institutes are encouraged to expand their sources of funding so as to have varied channels of financial resources to cover all the requirements of implementing best practice in education so that they will be able to compete worldwide by using the tools that many students enjoy the most i.e. educational technologies.

A. Limitations and Future Research

Limitations of the research include those general problems related to online surveys that have low response rates due to time constraints. Another limitation of this study is that covering all the colleges and universities was difficult for the same reason. The future of this research is progressing continuously to include the majority of the higher educational institutes in Oman.

B. Theoretical and Practical Implications

Studying and analyzing technology for enhancing the learning and teaching experience in higher education is a significant issue due to the fact that present-day students' way of thinking is very different from that of students in the past. The present generations of students are mostly digital natives who enjoy learning using educational technology. This research urges higher education institutes to make a concerted effort to meet their students' and instructors' expectations, requirements and interests in the utilizing of technology in teaching and learning. Therefore, they will have to take on the responsibility of overcoming any possible difficulties while using these technologies. Additionally, teachers will understand better what kind of tools or technologies students prefer to use during lectures. From this research, both higher education institutes and instructors should understand the benefits that contribute to the enhancement of students' overall performance as a result of incorporating technology into education. It is recommended that teachers find out the best tools and technologies to suit the students' needs and help them acquire more knowledge as well as enjoy learning. Finally, higher education institutes should be encouraged to supply the classrooms with the necessary equipment in order to aid such a move.

REFERENCES

[1] Sachs, J. D. and McArthur, J. W., (2002), Technological advancement and long-term economic growth in Asia, Technology and the new economy, MIT Press, Cambridge, MA, pp. 157-185.
[2] Wang, F. and Reeves, T. C., (2004), Why do teachers need to use technology in their classrooms? Issues, problems, and solutions, Computers in the Schools, vol. 20 (4), pp. 49-65.
[3] Development, B. C. f. D., (2013), the Broadband Commission Working Group on Education.
[4] Simmons, E. and Markwell, R., (2001), Advantages of educational technology, Educational Administration and Policy Studies, vol. 7 (1), pp. 1.
[5] Saba, A., (2009), Benefits of Technology Integration in Education.
[6] McCombs, B. L., (2000), Assessing the Role of Educational Technology in the Teaching and Learning Process: A Learner-Centered Perspective.
[7] Larson, E., (2013), How Many Teachers Use Technology in the Classroom?, Accessed on Available at: http://mashable.com/2013/02/05/teachers-technology-infographic/
[8] Jeanne Casares, D. A. D., Therese Hannigan, and Jenn Hinton, A. P. (2012), The Future of Teaching and Learning in Higher Education.
[9] Sidelinger, R. J., Ayash, G., Godorhazy, A. and Tibbles, D., (2008), Couples go online: Relational maintenance behaviors and relational characteristics use in dating relationships, Human Communication A Journal of the Pacific and Asian Communication Association, vol. 11 (3), pp. 333.
[10] Cisco, (2013), High-Speed Broadband in Every Classroom: The Promise of a Modernized E-Rate Program, Accessed on 03/06/2014, Available at: http://www.cisco.com/web/strategy/docs/education/e_rate_connected_wp.pdf
[11] Carlson, S. (2002), The Missing Link in Educational Technology, TechKnowLogia.
[12] Siemens, G. and Weller, M., (2011), Higher education and the promises and perils of social network, Revista de Universidad y Sociedad del Conocimiento (RUSC), vol. 8 (1), pp. 164-170.
[13] Minocha, S., (2009), Role of social software tools in education: a literature review, Education+ Training, vol. 51 (5/6), pp. 353-369.
[14] Selwyn, N., Carr, D., Noss, R. and Laurillard, D. (2008), Education 2.0?: Designing the Web for Teaching and Learning: a Commentary, Teaching and Learning Research Programme.
[15] Selwyn, N., (2012), Social media in higher education, The Europa World of Learning 2012.
[16] Communications and Marketing, (2012), The digital student: E-books, tablets and even smartphones becoming classroom staples, Accessed on 03/06/2014, Available at: http://www.k-state.edu/today/announcement.php?id=4236&category=news&referredBy=todayRSSFeed
[17] Stollak, M. J., Vandenberg, A., Burklund, A. and Weiss, S., (2011), Getting Social: The impact of social networking usage on grades among college students, In the proceeding of Proceedings of ASBBS Annual Conference, Las Vegas, 18, 1
[18] Connolly, M., (2011), Benefits and Drawbacks of Social Media in Education Accessed on Available at: http://www.wcer.wisc.edu/news/coverStories/2011/benefits_and_drawbacks.php
[19] Nagy, A. (2005), The impact of e-learning, In E-ContentSpringer, pp. 79-96.
[20] Alkhateeb, F., AlMaghayreh, E., Aljawarneh, S., Muhsin, Z. and Nsour, A., (2010), E-learning Tools and Technologies in Education: A Perspective, E-learning.
[21] Fardoun, H. M., Alghazzawi, D. M., López, S. R., Penichet, V. M. and Gallud, J. A., (2012), Online Social Networks Impact in Secondary Education, In the proceeding of International Workshop on Evidence-Based Technology Enhanced Learning, 37-45
[22] Jones, C. A., (2001), Preparing teachers to use technology, Principal Leadership, vol. 1 (9), pp. 35-39.
[23] Sife, A., Lwoga, E. and Sanga, C., (2007), New technologies for teaching and learning: Challenges for higher learning institutions in developing countries, International Journal of Education and Development using ICT, vol. 3 (2).

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[24] Marketing, C. a., (2012), The digital student: E-books, tablets and even smartphones becoming classroom staples, Accessed on Available at: http://www.k-state.edu/today/announcement.php?id=4236&category=news&referredBy=todayRSSFeed
[25] Culén, A., Engen, B. K., Gasparini, A. and Herstad, J., (2011), The Use of iPad in Academic Setting: Ownership Issues in Relation to Technology (Non) Adoption.
[26] Minocha, S., (2009), An empirically-grounded study on the effective use of social software in education, Education+ Training, vol. 51 (5/6), pp. 381-394.

Open Science Index, Information and Communication Engineering Vol:8, No:8, 2014 publications.waset.org/9998989/pdf