What hinders the use of ICT among academic staff at Yemen’s public universities?

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Abstract
The purpose of this study was to investigate the use of Information Communication Technology (ICT) in Yemen public universities. Three academic staff from Hodeida, Amran and Thamar universities were the participants of this study. The qualitative method was employed with one to one interview as an instrument of the data collection. Thematic analysis was employed to identify the patterns that reflect the factors affecting ICT use in universities. The findings revealed that the use of ICTs in Yemen’s universities still depends on lecturers’ self-initiative. The lecturer who has skills of using ICT appeared to have a positive attitude towards the use of ICT in their teaching. There is no type of social influence on lecturer’s use of ICT in their teaching. The poor infrastructure, poor facilitating condition and lack of the technical support stand as significant ICT barriers integration in Yemen’s Universities. All forms of online communication are absent in all three universities. The participants of this study urged their universities top management to provide a proper facilitating condition and training programs to enable their academic staff to cope up with 21st-century teaching and technologies.

Keywords:
ICT in education; attitude towards use; facilitating condition; social influence; public universities; Yemen

1 INTRODUCTION
The introduction of new media has dramatically affected all sectors of society. Higher education courses organization and delivery are one of the affected sectors. This effect has not been at the same level in all societies. The current state in ICT integration in higher education course show a huge digital gap between developed and developing countries (Hamidi, Ghorbandordinejad, Rezaee, & Jafari, 2011). It seems that developing countries are just at the footing steps of technology integration in education compared to developed countries (Hamidi et al., 2011). The Republic of Yemen is considered one of the least developing countries in the world. The current condition of ICT
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Integration in Yemen’s higher education indicates the absence of ICT integration in higher education institutions with only little exceptions.

Up to date most Universities in Yemen still using the traditional method of teaching and learning which include face-to-face lecturing, the hard copy of the course materials and pen to write the class notes (Aldowah, Ghazal, & Muniandy, 2015). In their study, Aldowah et al. (2015) investigated the use of e-learning in Hodeida University and reported five challenges that hinder the use of e-learning in the university which are human constraints, administrative constraints, technical constraints, financial constraints, and physical constraints. Nonetheless, Aldowah et al. (2015) focus was on only one of the public Universities in the country. Therefore, there is a need for another study to investigate the use of ICT tools in general and in several universities, which located in different governorates of the country. The purpose is to come out with more reliable findings and wider picture of the shared barriers that hinder the use of ICT in Yemen’s higher education institutions.

New technology introduction made it imperative to educational systems to face the increasing pressures to use ICT to teach students the knowledge and skills required in very competitive job opportunities in the information age. The Republic of Yemen is not isolated from such pressure as the improvement of ICT facilities and its use in Higher Education is a key point of the country development. Therefore, it is obvious that universities in Yemen need to be prepared to meet technology integration requirements, to fulfill the 21st-century demands (Ministry of Higher Education and Scientific Research of Yemen, 2005), to enhance academic performance and to contribute to the sustainable development of the national and global society (Rakels, 1994). It is clear that the world rapidly tends to heavily use of ICT which makes its role in education more important especially with the constant development in the 21st century (Noor-Ul-Amin, 2013).

The current status of ICT implementation in Yemen universities shows that they are facing many difficulties starting from the poor financial funds to provide a reliable infrastructure for ICT equipment, high-speed communication network, and reliable electrical supply to the inadequate training of the Universities academic and management staff (Ministry of Higher Education and Scientific Research of Yemen, 2005). Conversely, even with the significant increases in the budget for higher education investment, the equipment is still very poor and inappropriate to teach the professionals of the 21st century (Ministry of Higher Education and Scientific Research of Yemen, 2005). Moreover, the limited access to ICT devices resulted in the lack of ICT skills and negative attitude towards ICT use in teaching and learning among teaching staff in the universities. Consequently, in most cases teaching staff in Yemen’s Universities are still teaching with traditional approaches that consist of a whiteboard, textbooks, and teacher telling lectures (Aldowah et al., 2015). Hence, the Ministry of Higher Education and Scientific Research (MHESR) stepped forward and prepared the action plan to improve all aspects of higher education in the country through the national strategy for the development of higher education in Yemen 2005-2010. However, the political and economic difficulties that confronted the country hindered the application
of the mentioned strategy and achieving its objectives in the assigned period. Therefore, this study was intended to investigate the current situation of ICT integration in the universities in Yemen’s as it was one of the objectives of the national strategy to develop higher education in Yemen. Moreover, this study aimed to reveal the factors that stand as barriers to ICT integration in Yemen’s Universities.

2 REVIEW OF THE LITERATURE

Researchers argued that ICT still far from effective use in teaching and learning by a lot of teaching staff in the universities (Keengwe, 2006). However, the factors that hinder the use of ICT are not the same in all contexts. Developed countries in Europe, for example, are well equipped with technology compared to developing countries in Asia and Africa (Hamidi et al., 2011). Therefore, it is important to understand the barriers and enablers of teachers’ use of technology in teaching and learning. However, workplace facilities and teachers’ personal characteristics and ability were seen as the major factors that can influence the integration of technology in teaching and learning (Chai & Khine, 2006).

Bingimlas (2009) identified teachers’ lack of confidence, lack of competence and lack of access to the resources as the major barriers to technology integration in teaching and learning. Moreover, Al Mulhim (2014) listed some barriers that hinder teachers use of ICT in their teaching which is teachers’ attitude towards technology, teachers’ resistance to change, lack of time, teachers’ lack of confidence in using technology, and lack of knowledge and skills in using technology. Besides, Al Mulhim (2014) considered learning institution obstacles of ICT integration due to its lack of access to technology, lack of effective training, lack of technical support and the high cost of hardware and software. On the other word, teacher competence, accessibility to ICT recourses (software, hardware), professional development, and technical support are critical components of ICT integration in teaching and learning. Therefore, it is important to consider technological, individual, organizational and institutional factors when investigating ICT integration (Sherry & Gibson, 2002). However, the focus of the current study is on teachers’ level as it looks at teachers’ attitude towards the use of ICT, social influence and institutional level through investigating the facilitating conditions of several Yemen’s public universities.

Theoretically, many models explain technology acceptance among individuals. In this study, the author adapted three factors that seen as important for technology acceptance among teachers. Facilitating condition and social influence factors were adopted from the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh, Morris, Davis, & Davis, 2003). Additionally, attitude toward use was adopted from the Technology Acceptance Model (Davis, 1985). The mentioned factors are considered as important facilitators for ICT integration as they play substituted influence on each other. Consequently, the poor facilitating condition, low effects towards use and poor social influence are considered to form the significant ICT barriers integration for teaching and learning.

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2.1 Facilitating Condition

Facilitating conditions, in general, were defined as the “perceived enablers or barriers in the environment that influence a person’s perception of ease or difficulty of performing a task” (Teo, 2010). In case of ICT in this study, the researchers defined facilitating conditions as the availability of ICT facilities or the lack of ICT facilities in the institution that influence a person’s ability to use or a personal perception of ease or difficulty of using ICT tools. Facilitating condition considered to be one of the determinants factors of ICT integration in education. Yildirim (2007) found that one of the effective ways to teachers’ pedagogical use of ICT in teaching is access to technological resources. Moreover, good facilitating conditions found to have a positive effect on attitude towards ICT use as in Teo (2009b) while the poor facilitating condition was found as barriers to ICT integration for teaching and learning (Lim & Khine, 2006).

However, technical support is an important part of facilitating condition. Technical support includes providing helpdesks service, hotlines, and online support services (Teo, 2009, 2010). Moreover, the availability of on-time technicians is an important service to provide help to solve hardware and software technical problems and conduct regular maintenance for ICT equipment. The availability of technical support provides an advantage for teachers as they can integrate ICT in their teaching without worrying about sudden break-down problems or losing their time to fix hardware and software problems (Korte & Hüsing, 2006). In summary, a good facilitating condition is a crucial point of ICT integration in all levels of education and the key of teachers’ acceptance of ICT use for an educational purpose. Therefore, it is a vitally important to investigate the current states of facilitating condition in Yemen’s public universities and its effects on the teacher’s intention to integrate ICT in their teaching.

2.2 Attitude towards Use

Teachers’ attitude towards technology was seen to be affected by the quality of the facilitating condition (Teo, 2010), personal skills, and perceived ICT benefits. Hence, the positive attitude towards ICT use in education will lead to a better integration of ICT for teaching and learning (Huang & Liaw, 2005). Huang and Liaw (2005) asserted that teachers’ attitudes toward technology or an intention to use technology in their classrooms are the key factor of real integration. In some cases, providing teachers with excellent ICT facilities may not be enough to influence their intention to use it for teaching if they have a negative attitude towards its use. Therefore, teachers need to be assured that technology can make their teaching interesting, easier, more motivating and more exciting teaching (Huang & Liaw, 2005), and to be clear about its benefit in facilitating students’ learning and improving their performance. Therefore, investigating teachers’ attitude towards ICT in Yemen’s universities consists of teachers’ perception about the benefit of ICT use in education and its effect on students’ performance. Teachers’ responses would reflect them believe about the importance of ICT integration in their teaching which effects their intention of its actual use for teaching.
2.3 Social Influence
Social influence is the change that occurred in the individual’s thinking, feelings, attitudes, or behavior which come as a result of interaction with other individuals or groups (Mazuki et al., 2013). In terms of technology acceptance, social influence was defined as “the degree to which an individual perceives that important others believe he or she should use the new system” (Venkatesh et al., 2003). Social influence or social factors are part of subjective norms factor which refers to the perceived social pressure to perform or not to perform a behavior (Ajzen, 1991). Therefore, it was found that social influence has its effects on individual acceptance of technology (Yang & Choi, 2001). Moreover, individual intention to use the technology is highly directed by their perception that others expectation is that they should use the technology (Teo, 2010). However, Venkatesh et al. (2003) argued that in most cases individual perception about technology is similar to their co-worker. The reported findings reflect the importance of others influence on individual behavior and intention. Therefore, it is vitally important to include social influence factor effects on academic staff in Yemen’s universities integration of ICT in their teaching. However, this study focusses on the influence of universities teaching staff colleagues, bosses, and students on individual teaching staff intention to use ICT for teaching.

3 Methodology
3.1 Research Instrument
This study employed qualitative research methods in data collection and analysis. The semi-structured interview protocol was developed by the researchers to collect that data that achieve the study research objectives. The interview is a way to collect data as well as to gain information and opinion from individuals (Kajornboon, 2005). The interview was designed to cover the factors that hinder the integration of ICT in the Universities in Yemen. The interview intended to discover instructors’ attitude towards the use of ICT, the role of social influence on instructor’s use of ICT in their teaching and current states of ICT facilities in Yemen’s public universities. The factors that covered in the interview were adapted from the Unified Theory of Acceptance and Use of Technology (UTAUT) in Venkatesh et al. (2003) and Technology Acceptance Model in Davis (1985).

The researchers developed 22 open-ended questions that cover the aspects of teachers’ attitude towards the use of ICT in teaching and learning, social influence and ICT facilitating condition. One to one interview was conducted with each participant separately in three sessions with at least 45 minutes for each session. The interviews were recorded using audio recorder feature in the smartphone. The data was collected in the academic year of 2014/2015. The interviews were started with a general discussion, explaining the purpose of the study and the rights of the interviewees and confidentiality were also confirmed. Therefore, the participants were aware of their rights and the research ethics and the confidentiality of their identities were guaranteed and the use of the collected data only for this study was also confirmed.
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3.2 Research Sample
The participants in this study were three lecturers from three different universities. The universities namely were Thamar University, Hodeida University and Amran University. All the three universities are public universities, supported by the government and included in the national strategy of higher education. The participants were selected as they met the selection criteria. The three participants were permanent academic staff at their universities and spent at least two years in teaching at their named universities within the last two years.

3.3 Data Analysis
The data analysis started by transcribing the content of the interview from the audio files to text files using Microsoft Excel sheets. The content was coded, and each statement was categorized based on pre-determined themes using thematic data analysis. However, the focus was on the statements that reflect the themes that reflect the focus of this study, while unrelated statements weren’t included in the analysis. Then, the final draft of the coded and categorized themes was used to show the findings of this study.
To address the research questions of this study, the data were analyzed and presented based on the following:

- **Attitude towards Use of ICT**: the analysis of this factor includes instructors’ ICT skills, teachers’ view about the use of ICT for educational purpose and teachers believe about the effects of ICT of Students’ learning and performance.
- **Facilitating Conditions**: ICT facilitating condition in this study include ICT infrastructure and tools, technical support and training programs.
- **Social Influence**: including University influence, colleagues influence, and students’ influence.

4 FINDINGS AND DISCUSSION
In this section, researchers reported and discussed the interview findings which cover the teachers’ attitude towards the use of ICT tools for the educational purpose, current facilitating conditions and the social influence on instructors’ integration of ICT in their teaching in Yemen’s public universities.

4.1 Attitude towards Use of ICT in Teaching
To find out teachers attitude towards ICT use for teaching, the researchers' focus was on teacher’s ICT skills, perception about the use of ICT for educational purpose and the perceived effect of ICT on students’ learning and performance.

4.1.1 ICT skills
All participants of this study were asked about their ability to use ICT devices such as a computer, internet, data show, overhead projector, TV, and video? The participant reported their abilities and skills of using some ICT tools. The participants of this study expressed their ability to use ICT tools as they have the skills of its use. This finding can be attributed to the age of the participants.
of this study. The participants of this study were from the young generation staff who grew up in the age of technology. Moreover, new generation lecturers have the skills of using ICT devices as they gain their higher education degrees from foreign universities in the peak time of technology. However, the findings of this study are supported by previous study argument that young teachers relatively had a greater opportunity to be trained in ICT than old teachers, because the importance of ICT became apparent during years of the 90’s (Tedla, 2012). Additionally, Pelgrum (2001) related teachers’ use of the innovation for educational purpose to their skills. On the other hand, Pelgrum (2001) argued that teachers’ lack of technology use skills is the main hindrance to the use of ICT in teaching. Therefore, the participants of this study ICT skills and experience was partly contributed to their actual use of ICT for teaching.

4.1.2 Attitude towards the Use of ICT

The participant was asked to express their opinion about the use of ICT for education and the advantages of using ICT in teaching compared to traditional teaching. The responses indicated that the participants have a positive attitude towards the use of ICT in their teaching. It seems that the features of ICT tools facilitate lecturers’ presentation of knowledge supported by video and colored graphics. The participants’ responses showed that they are in favor of ICT integration for teaching and learning over traditional teaching method. ICT helps teachers to use the provided features to save their time and support their teaching with various types of teaching aids. For example, ICT tools are seen to save the lecturers’ time in the classroom as the information is already pre-prepared and no need for much blackboard writing during lecturing time. Besides, ICT tools can provide teaching aids in different forms such as video, audio, graphs, pictures, and text. These teaching aides help lecturer by making his message clear which help students for better understanding of the given information. Therefore, lecturers tend to welcome ICT in their teaching to overcome some of the traditional teaching method difficulties.

4.1.3 ICT Effects on Students’ Understanding and Performance

The participants were asked to give their opinion about the effect of ICT on students’ understanding and performance. The findings of this study revealed that university lecturers have a different opinion about the effects of ICT on students’ understanding and performance. Their difference depicts the current situation of ICT use in Yemen’s Universities. ICT use in Yemen’s universities still limited to a few numbers of academic staff who take it a personal initiative. Therefore; ICT effects on students’ understanding and performance still invisible due to the poor integration of ICT in education. On the other side, students’ use of ICT for learning still limited due to their lack of skills, lack of ICT tools that mediate learning and the lack of teacher influence. Even though some lecturers use PowerPoint slides, students request for the hardcopy of the notes because they don’t have personal computers or an email that enables the lecturer to email them the notes. As a result, students’ performance and
understanding still measured based on traditional teaching and learning without a little impact of ICT tools.

In general, this study found that lecturers have a positive attitude and positive effects on the use of ICT in their teaching process. Their positive attitude towards ICT in education led them to integrate ICT into their teaching voluntarily. Sang, Valcke, Braak, and Tondeur (2010) emphasized the importance of teachers’ attitudes towards the use of ICT in education. Negative attitudes of teachers and the limited knowledge of teachers about technology integration are found to be the main barriers for the technology integration in education (Cakir & Yildirim, 2009; Hew & Brush, 2007).

4.2 Facilitating Condition

Facilitating condition under the focus of this study is the current state of ICT infrastructure and tools, available technical support and training programs.

4.2.1 Available ICT Infrastructure and ICT Tools

At first, the participants of this study were asked about the available ICT infrastructure in their universities. The findings of this study indicated that all three universities have very limited ICT infrastructure. The infrastructure confined to one or two computer labs, Data show in some classes of course without computers, computers in some department’s offices. As explained by computer lecturer (participant B), they have only two computer labs in the faculty. The bigger lab consists of forty computers and its capacity is limited to only forty students. To solve the limited number of computers problem compared to a huge number of students, the lecturer must divide his computer course students to groups; every group consists of forty students. Every group has a chance to use the computer once per week with only two hours a week. Computer lecturer commented that sometimes two or three students share in one computer. The participants also reported that there is a limited internet connection, the absence of online communication and unsteady electrical supply.

Gomes (2005) found that the lack of appropriate infrastructure and resource to be barriers to ICT integration. Gomes finding applies to Yemen ICT infrastructure in the universities. The results of our study illustrated the current situation of the ICT facilities in Yemen universities. ICT development in Yemen universities seems to be lifted behind. The current use of ICT by respondents is limited to the use of PowerPoint and data show. Also, from the findings we found that there is no online communication between lecturers and their students, the respondents attributed that to the absence of university/faculty web site or e-learning platform, students’ lack of computer skills in addition to cultural effects that hinder online communication between lecturers and female students or male students with female students. As a result, lecturers prepare hardcopy for their notes to be given to students as an easy way that helps all students to copy the notes for their study. European study found that the lack of access to ICT materials is the largest barriers to using ICT (Korte & Hüsing, 2006).
4.2.2 Available Technical Support

The participants were asked about the availability of technical support in their universities. As revealed by participants of this study, the technical support seems to be absent in Yemen public universities. When a lecturer encounters any technical problem, he/she must repair by him/herself or take the device to the maintenance service in the market to solve the problem, and this may take a longer time. The lack of technical support seems to be a reason for most academic staff to avoid the use of ICT tools in their teaching. When lecturers face any technical problem inside the classroom they directly turn to traditional teaching because there is no technician to solve the problem at the same times. In this case, to avoid being embarrassed in front of students, lecturers turn away from ICTs integration in their teaching. Similarly, another study reported that the computer breakdown with a lack of technical support causes teacher interruptions (Jones, 2004). Also, the same study reported that the lack of technical support would likely lead to poor regular repairs of the computers. As a result, the teacher will not use a computer in teaching (Jones, 2004).

4.2.3 Training Programs

In this section, the participants were asked about the availability of training programs and how regular the training is conducted in their universities. The participants of this study reported that there is a lack of proper training programs. All participants illustrated that there are not enough training programs for academic staff. Nonetheless, in case of any training programs, the attendance is not mandated, and it is up to the lecturer to attend or not. Therefore, the participants expressed the need for conducting and mandating regular training programs to train academic staff to use computers, search the internet and how to use computer software such as PowerPoint. Such training can help them in their teaching and when they attend conferences in other countries.

Generally, the findings of this study showed the lack of training programs that led to less ICT integration by the academic staff. These findings are in this study is in line with Beggs (2000) which found that the lack of training programs is one of the top barriers that hinder teachers’ uses of ICT in their teaching. Moreover, Al-Ahdal (2013) asserted that conducting a regular ITC training is the key of ICT integration by the teacher as they have more confidence of its use and have more understanding of the value of its use for teaching. Therefore, Yemen higher education institution is advised to provide more training programs for academic staff to improve their skills to easily integrate ICT in their teaching. Moreover, participation in the training must be mandated and adjusted with lecturers’ free time. Training programs can be conducted during semester breaks or in the academic year end long vacation. It is hoped that staff engagement in more training and getting more competence may improve their ICT skills which lead to a positive attitude towards its use in their teaching. It was argued that giving the time to the teachers to learn, practice the use of technology, share and collaborate with others most likely will lead them to integrate technology in their teaching (Buabeng-Andoh, 2012).
4.3 Social Influence

The focus of social influence investigation was limited to the rule the social community in the institutions on lecturers’ intention to use ICT in their teaching. Thus, the participants were asked if there is any influence from university and faculty top management, colleagues and students that encourage instructors to integrate ICT in their teaching. However, the participants’ attribution of their use of ICT to their initiative shows the absence of the university/faculty rule in leading the change in terms of adoption of new technology for teaching instead of sticking to the traditional method. This absence of the top management and colleagues influence on teachers’ integration of ICT could be attributed to the poor ICT infrastructure which is hard to meet the need of the instructors if they turned to integrate ICT in their teaching. Moreover, it might also be referred to as the lack of awareness of the important role of ICT in facilitating teaching and learning. However, the findings of this study revealed that no effective social influence could encourage lecturers to take steps to integrate ICT in their teaching.

5 Conclusion

The findings of this study indicated that there are only lecturer’s ICT skills and effects towards its uses as standing variables that facilitate their integration of ICT in the teaching process. Other factors namely social influence and facilitating conditions stand as barriers towards the use of ICT in Yemen universities. There are also some barriers that mentioned by the participants such as poor administrative support, lack of time and students’ lack of ICT skills. Therefore, the use of ICTs in Yemen’s universities still depends on the lecturer’s initiative and readiness. Universities and faculties have no integration strategy to integrate ICTs for educational purpose. The current facilitating condition appeared not to be suitable for a higher education level. Therefore; it is imperative for universities and faculties in Yemen to take action and establish their way to ICT integration in the teaching process.

6 The Implication of the Study

The findings of this study are a very important addition to the limited existing knowledge about ICT use in education in Yemen. This study was an effort to reveal the current positions of ICT integration in Yemen public universities. This study is different from previous studies as it covered three different public universities in the country and focus on both academic staff attitude towards ICT integration in their teaching as well as on the current ICT facilitating condition in the universities under focus. Moreover, this study went beyond that to reveal the absence of the social community in the universities’ effect on academic staff decided to use ICT in their teaching. However, the findings of the current study will be an important reference for policy and decision makers in higher education institutions in Yemen to take steps forward to establish suitable ICT infrastructure and facilities in higher education institutions in the country. It is imperative for Yemen higher education sector to cope up with the 21st-century education system requirement and to benefit from the constant technological advancement.
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