WCES 2012

Effectiveness of using information technology in higher education in Saudi Arabia

Fahad N. Alfaahad

Abstract

Information technology (IT) refers to “personal electronic devices such as laptops and handheld computers, smart phones, and institution’s computers and associated devices”. This study investigates the usefulness, efficiency and efficacy of information technology in higher education in the Kingdom of Saudi Arabia. The study was conducted in the College of Education, King Saud University. The survey was distributed among 161 female college students selected randomly from a pool of 400 female students who were attending different courses in different areas. Results indicated that 61.5% of the participants used the electronic device in their course activities and 65.8% used IT for blogging. Interestingly, 72% of participants are often doing online shopping and 88.6% of the students are often creating read, send e-mail and instant messages. A number of issues arising from this study were included in the conclusion and implications.

Keywords: higher education, educational technology, e-learning, Saudi Arabia

Introduction

Information technology (IT) refers to an integrated framework of computers, software applications, multimedia content, the Internet, web-based applications, learning management systems (e.g. IVLE) and other tools that can be used to enhance the teaching and learning process. The benefits of using IT in teaching are supported by research and literature also integrating IT into the curriculum as it helps to improve the quality of teaching and learning. The subject of IT tops the agenda of almost every college and university today because of the expectations of a technologically advancing society and because aggressive IT utilization is seen as an indicator of a progressive institution (Milligan, 2010; Shanon et al, 2009; Caruso, J.B. et al, 2007). The rapid information technology (IT) advances have extended to all aspects of business including the accounting profession. The impacts of the dynamic nature of IT on accounting practices force accounting education to reform its programmes in order to keep pace with changes in the profession. IT skills have become another mandatory skill for practising accountants (Bouchard, 2005; Kepczyn, 2005) besides other generic skills such as leadership skill, communication skill and general business knowledge (Robert Half International Inc., 2003). The Issue of integrating IT skills in accounting education has been a continuing concern for many parties including professionals, educational bodies as well as accounting educators all over the world (AAA, 1986; AECC, 1990; IFAC, 1995a, 2003; Salleh, 2000; Chang and Hwang, 2003; Ahmed, 2003, Lin et al, 2005; Jones and Abraham, 2007).

Academics and professional organizations have called for IT competent graduates and have voiced concern over whether accounting education can effectively and efficiently prepare accountants to meet the challenges (AAA, 1986; AECC, 1990; Dearing, 1997; Lyons, 1997; Boritz, 1999; Stoner, 1999; Albrecht and Sack, 2000; IFAC, 1995,
Researchers, business leaders, professional educators as well as academic organizations have made rigorous initiatives and efforts to strengthen IT integration in accounting education. These include (but not limited to) Bhaskar, (1982;1983), Er and Ng, (1989), Collier et al., (1990), Crawford and Barr, (1998) and Salleh, (2000) who discuss alternative uses of the computer in accounting education. Besides, there are professional accounting bodies and academic organizations such as BAA-SIG accounting education, BAAEC, Dearing (1997) IFAC(1995,2003) and QAA(2000a,2000b,2000c) that encourage and provide some guidance to integrate IT in accounting programmes. For example Dearing (1997) recommends establishing the Professional Institute of Learning and Teaching in Higher Education which has among its functions a leading role in assisting institutions to exploit the potential of communications and information technology for learning and teaching. Last but not least, there are some educators (these include) Marriot, 1992; Marriot et al., 1999; Sangster, 1992, 1995a, 1995b; Sangster and Mulligan, 1997; Larres and Radcliffe, 2000; Larres et al., (2003) who report on their actual experience in integrating IT into their taught accounting units.

IT with its new technologies serves a number of functions. Brown (2000) refers to these functions as that digital shift because it converts people’s thinking, knowledge, and communication to digital and information form. In the field of education, IT is commonly seen as how computers and the Internet can best be harnessed to improve the efficiency and effectiveness of the process of teaching and learning (Guha, 2003). It can have a transformative effect on educational systems because it is a potentially powerful tool for extending educational opportunities and greatly facilitate the acquisition and absorption of knowledge (Conlon & Simpson, 2003) with the use of computers. It tends to redefine teacher and student roles and beliefs about teaching and learning (Guha, 2003). The teacher becomes a coach and collaborator rather than a dispenser of knowledge with the implementation of computer use into schools.

This paper describes and analyzes trends in the information technologies and the impact these have on the education sector as a whole, but particularly on the higher education sector. These technologies can be used to address the changing demands within the sector:

For more flexible learning.  
For extension of university services to national and international markets; and  
For more cost-effective delivery of higher education in an increasingly competitive environment.

The growing use of information technologies in education is part of a wider technological revolution, evidenced in:

The increasing use of computers and the Internet in Saudi Arabia.  
The growth of the on-line economy within Saudi Arabia.  
The Increasing competition in communication services.  
The broader public policy environment regarding the learning society and the use of educational technology.

3. LITERATURE REVIEW:

The need for IT competency development in undergraduate accounting education is acknowledged in the literature by accounting educators and practitioners, as is mentioned in the background to the study in the introduction section. This includes among others Albrecht and Sack, 2000; Ahmed, 2003; Howieson, 2003; Chang and Hwang, 2003; Lin et. al. 2005; Jones and Abraham, 2007. Most of the studies were informed by a quantitative approach based on survey data except Albrecht and Sack (2000), which complements the survey data with interviews. Basically, they investigate the extent to which the IT skills as outlined by (Albrecht and Sack, 2000; Howieson, 2003; Chang and Hwang, 2003; Lin et al. 2005; Jones and Abraham, 2007) and IFAC/IEG-11 (Ahmed, 2003), are developed in the accounting programmes in various countries such as USA (Albrecht & Sack, 2000; Cang & Hwang, 2003), China (Lin et. al., 2005), UK (Ahmed, 2003) and Egypt (Ahmed, 2003). While the studies reveal the degree of the IT skills development relative to the guidelines, they fail to discover other important issues like...
approaches used to develop the skills, awareness of educators on the guidelines, and the reason of developing as well as not developing the skills.

What IT competencies are and how they should be developed in undergraduate studies are two important questions to be explored in order to ensure a successful implementation of developing IT competencies in accounting graduates. The subsequent subsections review literature on guidelines on IT skills development, possible ways of developing IT skills and issues in implementing them and key success and failure factors.

Kvavik and Caruso (2005) found that students actually support a moderate amount of technology in their courses. They also reported that students have lower skill levels in course-related technologies, such as using specialized software, or a course management system, such as Blackboard. Therefore, assessing the level of Information Technology (IT) literacy on a given campus is important in making decisions regarding technology incorporation into curriculum and other future campus-wide investments in technology resources (Tyler, 2005).

Even though, technology is more available for instructors now than ever before, many of them are resistant to incorporating technology into their classrooms. Cuban (1999) states that professors and students at the university level have grown comfortable with e-mail and Web pages, but less than 10 percent of faculty use these technologies for teaching. However, even those instructors who embrace technology still find barriers that inhibit its use in the classroom. In a study by Brill and Galloway (2007), two limitations to the use of technology in instruction were noted: inadequate availability of technology, and classrooms that do not adequately support technology. Ultimately, the decision to use technology is up to the instructor. While the examples above illustrate some of the barriers to the use of technology, the question still remains as to what influences a faculty member’s decision as to whether or not to use technology in the classroom.

Fortunately, previous research on IT provides some valuable insights. Various factors such as feelings, beliefs, attitudes and perceptions have emerged from the literature as inputs into the decision whether or not to integrate technology into one’s teaching. These factors have an outward appearance of complexity and can be confusing. However, when broken into two categories, internal and external factor trends emerge that make them more understandable.

3.1 INTERNAL FACTORS

The most common internal factors that influence an instructor’s decision to incorporate technology in teaching are individual beliefs (Albion & Ertmer, 2002), feelings and anxiety (Dusik, 2000), fears, preferences and perceptions (Grasha & Yangabar-Hicks, 2000) and feelings of competence (Dusik, 2000). Kane, through her assessment of available research, asserts that “teachers’ personal beliefs, perceptions, attitudes, and orientations are correlated with (their) teaching practices” (Kane, Sandretto, & Heath, 2002, p.182). In other words, the decision to incorporate new pedagogy into teaching is attributed to the instructor’s feelings about themselves and what they have previously learned. Given this, one can extrapolate that if an instructor has a positive attitude or orientation towards technology, he will be more inclined to incorporate it into his teaching.

Another way beliefs influence the decision whether or not to integrate technology is the view the instructor has towards various teaching practices and styles. Grasha and Hicks (2000, p.3) found that teaching styles are based on “the needs, emotions, motives, beliefs, and attitudes of the teacher and that these teaching practices, when used positively, are the force behind student success.” In addition, Ferguson (2004) builds on this and indicates that teacher’s decisions to integrate technology into instruction are based on their teaching styles and strategies. Ferguson’s study places faculty into four types based on their use of technology in instruction: first-wave (self-starters), second-wave (traditionalists), third-wave (careerists), and fourth-wave (reluctants). The personal beliefs of each group encourage or hinder the use of technology in instruction. For example, fourth-wave instructors
Reluctants are not enthusiastic when it involves technology integration because this group believes in the “superiority of the traditional models of learning, “focusing on a teacher-centered and repetitious model of learning (Ferguson, 2004, p.136).

These beliefs which are to group faculty members are often developed early in their academic career. Albion and Ertmer (2003) explained that teachers’ beliefs about technology use are formed “during time spent in the classroom either as teachers or students” (p.36). Therefore, whether faculty members form their pedagogical beliefs about using technology while they are in school themselves, or after they begin their teaching careers, efforts should be made to improve their interaction with technology early in their careers.

Competency, another internal factor that determines faculty use of technology, is critical in making teachers not feel well prepared are those who have been in the field for ten or more years. This group may be reluctant to incorporate technology because they lack the technology skills needed. This lack of skills is due mainly not having been trained or not having been technology modeled during their early academic career (Rosenfeld & Martinez-Pons, 2005). Bandura and Schunk (as cited in Ertmer, 2005), “highlight the importance of building teachers’ confidence through successful experiences with small instructional changes before attempting larger changes” (p.33).

Rovai and Childress (2003) found that computer apprehension or anxiety is related to psychological factors which can be helped with the right instruction, they suggest that those who take courses which build self-efficacy and expand their knowledge of computers minimize the anxiety they feel towards integrating technology into actual classroom situations. Christensen (2002) further reports technology anxiety may be reduced if faculty members are taken through training which offers several stages of adoption. It is through these adoption stages that instructors increase their confidence and competency levels while integrating technology into coursework.

Therefore, based on the literature, internal factors are important motivating factors in faculty members’ use of technology. If attention is paid to faculty members’ beliefs, competencies and comfort with technology, there should be a stronger likelihood that they will integrate technology successfully into their classes. However, the internal variables discussed above are only half of the story. To fully understand the issues surrounding faculty members’ decisions whether or not to integrate technology, one has to also consider the external factors.

3.2 EXTERNAL FACTORS:

External factors include faculty demographics, specifically age and gender, class size and institutional support. Demographics such as age and gender may be primary factors that determine whether faculty members use technology (Cooper, 2006, p.331). In their study, Peluchette and Rust, (2005) state that at the university level, faculty who are in the middle of their careers can either be “allies or stubborn opponents as their institutions adjust to competitive pressures, revise programs to meet the needs of increasingly diverse students, and integrate new educational technologies” (p. 201). Several reasons are provided as to why this may be true. First of all, tenured faculty may not be compelled or motivated to use technology. Secondly, older or senior faculty members may not have the knowledge or training to use technology. This leads to competency issues for older or tenured faculty.

Another demographic factor is gender differences. According to Spots (1997), male faculty members tend to rate their knowledge and use of technology higher than their female counterparts. However, female instructors take factors such as lack of time and lack of professional advancement into consideration when deciding whether or not to integrate technology into the curriculum. Additionally, Lumpe and Chambers (2001) posit from their study that female instructors are more likely to believe that external factors, such as administrators, students, equipment, and professional development, directly influence a person’s ability to be successful with technology.
According to Pleuchette and Rust (2005), another external factor, namely class size, can negatively influence technology use. When faculty members use technologies such as email and chat rooms, larger classes can be difficult to manage, especially when teaching an online course. According to Kelly and Maushak (2004) there is no answer to the question of what the ideal class size is, as subject matter as well as the types of assignments instructors use are factors to take into consideration when integrating technology into the curriculum.

Institutional support, the final external factor reviewed, encompasses a wide range of topics including faculty development, ease of access for faculty members who wish to use technology, policies and procedures and support for technological issues. Osika (2006) argues successful technology programs require support from the institution. This is also reiterated in the Allen and Seaman’s study (2008) where those most successful and engaged with supporting instructional technology, especially online technologies, are those institutions that include technology support in their long-term strategic plans.

It is clear that successfully incorporating technology as well as distance learning programs into the curriculum is a complex issue facing institutions of higher learning. This issue is complicated further by the various factors which influence instructor’s use of information technology in a classroom setting.

This survey focuses on the undergraduate student’s experiences with and opinions about information technology. The primary goal of the study is to better understand student experiences with information technology, which, in turn, can help school’s leadership to respond to IT needs. For the purpose of this survey, IT refers to “personal electronic devices such as laptop and handheld computers, smart phones, and institution’s computers and associated devices.

4. METHODOLOGY:

The study was conducted in the College of Education, King Saud University, Riyadh, Saudi Arabia. The survey was conducted in Arabic. The survey questionnaire was distributed to 161 female students. A random sample of undergraduate female students (N = 161) age (20 – 24) years filled in a questionnaire. All participants were asked to complete a questionnaire measuring all types of student’s experiences, usefulness, effectiveness and opinions about information technology. Key questions were adopted from this stage as shown in Table 1.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Statements</th>
<th>Once per semester</th>
<th>Monthly</th>
<th>Weekly</th>
<th>Several times per week</th>
<th>Daily</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>How often do you use an electronic device for course activities?</td>
<td>22 (13.7)</td>
<td>28 (17.4)</td>
<td>44 (27.3)</td>
<td>55 (34.2)</td>
<td>12 (7.5)</td>
</tr>
<tr>
<td>2.</td>
<td>How often do you use an electronic device to access a library resource on an official college or university library website?</td>
<td>22 (13.7)</td>
<td>45 (28.0)</td>
<td>31 (19.3)</td>
<td>43 (26.7)</td>
<td>17 (10.6)</td>
</tr>
<tr>
<td>3.</td>
<td>How often do you use an electronic device as an in-class requirement?</td>
<td>55 (34.2)</td>
<td>40 (24.8)</td>
<td>27 (16.8)</td>
<td>18 (11.2)</td>
<td>15 (9.3)</td>
</tr>
<tr>
<td>4.</td>
<td>How often do you use an electronic device for writing documents for your course work?</td>
<td>22 (13.7)</td>
<td>37 (23.0)</td>
<td>39 (24.2)</td>
<td>45 (28.0)</td>
<td>17 (10.6)</td>
</tr>
<tr>
<td>5.</td>
<td>How often do you create, read, send email and instant messages?</td>
<td>8 (5.0)</td>
<td>11 (6.8)</td>
<td>24 (14.9)</td>
<td>42 (26.1)</td>
<td>75 (46.6)</td>
</tr>
<tr>
<td>6.</td>
<td>How often do you play computer games?</td>
<td>38 (23.6)</td>
<td>29 (18.0)</td>
<td>24 (14.9)</td>
<td>32 (19.9)</td>
<td>36 (22.4)</td>
</tr>
<tr>
<td>7.</td>
<td>How often do you download web-based music or videos?</td>
<td>28 (17.4)</td>
<td>33 (20.5)</td>
<td>22 (13.7)</td>
<td>42 (26.1)</td>
<td>31 (19.3)</td>
</tr>
</tbody>
</table>
8. How often are you doing online shopping? 76 (47.2) 40 (24.8) 13 (8.1) 6 (3.7) 7 (4.3)
9. How often are you blogging? 5 (3.1) 8 (5.0) 6 (3.7) 28 (17.4) 106 (65.8)
10. How often do you participate in online social networks (The facebook.com, friends. Com etc.? 39 (24.2) 13 (8.1) 21 (13.0) 33 (20.5) 45 (28.0)
11. How often do you use an electronic device for creating spreadsheets or charts (Excel, etc?)? 63 (39.1) 44 (27.3) 24 (14.9) 17 (10.6) 5 (3.1)
12. How often do you use an electronic device for creating presentations (power Point, Keyrote, etc)? 25 (15.5) 59 (36.6) 29 (18.0) 39 (24.2) 8 (5.0)
13. How often do you create Web pages? 85 (52.8) 24 (14.9) 12 (7.5) 14 (8.7) 12 (7.5)
14. How often do you access a course management system (ANGEL, EEE, Web CT, Black board, Desire 2 learn, First class, Model, Sakai, on Course, etc)? 79 (49.1) 29 (18.0) 16 (9.9) 11 (6.8) 8 (5.0)

Note: Figures in brackets indicate percentages.

The questionnaire, including a cover letter, was distributed to participants during the class. All subjects were asked to respond to the questionnaire and their responses were guaranteed confidentiality. The data of this study was gathered by means of a paper and pencil survey. The survey consists of 14 short questions. Respondents of the Survey were undergraduate students College of Education. The total number of respondents was 161 students. The questionnaire was distributed at the end of the semester in May, 2010. The data collected was processed and statistically analyzed through SPSS Ver. 10. Table 2 shows the descriptive statistical respondents. The survey students were College students undertaking different courses.

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>161</td>
<td>3.04</td>
<td>1.17</td>
</tr>
<tr>
<td>2.</td>
<td>161</td>
<td>2.87</td>
<td>1.29</td>
</tr>
<tr>
<td>3.</td>
<td>161</td>
<td>2.25</td>
<td>1.38</td>
</tr>
<tr>
<td>4.</td>
<td>161</td>
<td>2.97</td>
<td>1.24</td>
</tr>
<tr>
<td>5.</td>
<td>161</td>
<td>4.01</td>
<td>1.20</td>
</tr>
<tr>
<td>6.</td>
<td>161</td>
<td>2.96</td>
<td>1.53</td>
</tr>
<tr>
<td>7.</td>
<td>161</td>
<td>3.00</td>
<td>1.49</td>
</tr>
<tr>
<td>8.</td>
<td>161</td>
<td>1.58</td>
<td>1.18</td>
</tr>
<tr>
<td>9.</td>
<td>161</td>
<td>4.23</td>
<td>1.39</td>
</tr>
<tr>
<td>10.</td>
<td>161</td>
<td>3.01</td>
<td>1.72</td>
</tr>
<tr>
<td>11.</td>
<td>161</td>
<td>1.96</td>
<td>1.20</td>
</tr>
<tr>
<td>12.</td>
<td>161</td>
<td>2.65</td>
<td>1.17</td>
</tr>
<tr>
<td>13.</td>
<td>161</td>
<td>1.77</td>
<td>1.39</td>
</tr>
<tr>
<td>14.</td>
<td>161</td>
<td>1.67</td>
<td>1.29</td>
</tr>
</tbody>
</table>

5. RESULTS AND DISCUSSION

The primary goal of the study was to have a better understanding of student experiences with information technology (IT), which, in turn, can help school's leadership to respond to the IT needs. Tables 1 and 2 shows the percentage of the descriptive statistics of data for student’s impressions concerning the use of information technology.

On the subject of "... use an electronic device for course activity" Q.1, from the survey, we found that 61.5% of these surveyed or 99 out of the 161 participants (weekly/ several time per week), have used the electronic device in their course activities, while 13.7% of the remaining students stated that they only use the electronic devices once per semester.
Survey respondents (monthly, weekly), often use an electronic device to get access to a library resource (Q.2, 74%), and a large number of students use IT for blogging (daily/weekly), (86.9%) or 140 out of the 161 participants (Q.9).

Interestingly, 72%, 116 participants out of the 161 are often doing online shopping (Q.8), (once per semester /Monthly).

We found that the majority (87.6%) of the students or 141 students often create, read, send e-mail and instant messages (daily /weekly) (Q.5).

When students were asked, “how often do you use an electronic device as an in-class requirement?” (Q.3), 20.5% or 33 students said they don’t use the electronic devices in class (Daily / several times per week). Meanwhile 59% or 95 students are using the electronic devices once per semester/monthly.

However, 52.2% or 84 students often use the electronic devices for writing documents for course work (Q.4) (weekly/ several times per week). Only 10.6% or 17 out of 161 of the remaining participants are using the devices daily.

When students were asked "how often do you create web pages? (Q.13); 52.8% or 85 out of 161 participants said they created web pages (once per semester) and only 7.5% or 12 students created web pages daily. 49.1% or 79 students often access a course managements system (Q.14%) (Once per semester) and only 5% or 8 students out of 161 participants’ access a course managements daily.

Regarding the use of electronic devices for creating presentations (Q.12); only 5% or 8 students of the participants were creating presentations daily. Meanwhile 52% or 84 students created presentation (once per semester/monthly).

Respondents used the electronic device many times daily and doing online activities, for university, work and recreation. The most frequent times used daily (18.26%) a total of (53.33%) times per week. There are also those who spent (26.27%) times per semester, and (20.39%) times monthly using the electronic device.

Respondents were quite diverse in how they spent their time using technology. E-mail and writing documents for courses have become ubiquitous; the majority of respondent use e-mail daily and write documents, for their courses at least several times per week. The use of university or college library Web site is not far behind.

However, Table 3, gives the results of extracted communalities of all the variables. It shows the proportion of the variance of a variable explained by the common factors. From Table 3, it is very clear that "how often do you use an electronic device as an in-class requirement?" Q.3 has the least percentage (30.0%) of variance that can be predicted or explained by other 13 variables. On the other hand, "how often do you use an electronic device for writing documents for your course work?” has the highest variation (64.0%) that can be accounted for by the other 13 variables. These results reveal the importance attached to the fact that "... using an electronic device is an in class requirement".

<table>
<thead>
<tr>
<th>Variables</th>
<th>Initial</th>
<th>Extraction</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1.000</td>
<td>.564</td>
</tr>
<tr>
<td>2.</td>
<td>1.000</td>
<td>.531</td>
</tr>
<tr>
<td>3.</td>
<td>1.000</td>
<td>.300</td>
</tr>
<tr>
<td>4.</td>
<td>1.000</td>
<td>.640</td>
</tr>
<tr>
<td>5.</td>
<td>1.000</td>
<td>.508</td>
</tr>
<tr>
<td>6.</td>
<td>1.000</td>
<td>.562</td>
</tr>
<tr>
<td>7.</td>
<td>1.000</td>
<td>.479</td>
</tr>
<tr>
<td>8.</td>
<td>1.000</td>
<td>.343</td>
</tr>
<tr>
<td>9.</td>
<td>1.000</td>
<td>.336</td>
</tr>
<tr>
<td>10.</td>
<td>1.000</td>
<td>.523</td>
</tr>
<tr>
<td>11.</td>
<td>1.000</td>
<td>.337</td>
</tr>
<tr>
<td>12.</td>
<td>1.000</td>
<td>.602</td>
</tr>
<tr>
<td>13.</td>
<td>1.000</td>
<td>.596</td>
</tr>
<tr>
<td>14.</td>
<td>1.000</td>
<td>.577</td>
</tr>
</tbody>
</table>

The communality of (64.0%) in "using electronic device for writing documents “ can be predicted by the usage of other variable studies. Thus an improvement in the usage of other variables will have a corresponding effect on using the electronic device technology for writing documents for the coursework.
Another statistical analysis instrument is the reliability coefficient, Cronbach's Alpha (Cronbach, 1951) used to estimate the scale of consistency among items in the group (Hair et al. 1998).

Cronbach's Alpha was used to determine the internal consistency of each scale in this research. A Cronbach's Alpha coefficient is close to 1.0 means that the questions are measuring similar dimensions of factor. Although the general limit is 0.7, score 0.6 would be acceptable because of the exploratory nature of this research. By this standard, any factor with Cronbach's Alpha coefficient less than 0.6 should be eliminated. Table 4, illustrates the factors extracted from factor analysis and the Chronbach's alpha for reliability analysis of data.

Table 4: Rotated Component Matrix for factor Analysis in the Information Technology

<table>
<thead>
<tr>
<th>Variables</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.578</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>.598</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>.472</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>.567</td>
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<td></td>
</tr>
<tr>
<td>5</td>
<td>.531</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>.685</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>.552</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>.423</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>.404</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>.546</td>
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<td></td>
</tr>
<tr>
<td>11</td>
<td>.569</td>
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</tr>
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<td>12</td>
<td>.540</td>
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<tr>
<td>13</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>.531</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rotated Sums of Squared Loadings:</td>
<td>3.437</td>
<td>2.029</td>
<td>1.432</td>
</tr>
</tbody>
</table>

Factor analysis led 14 questionnaire statements. As a result of the reliability analysis, two of the three factors received Cronbach's alpha coefficient greater than 0.6, which indicate that those two factors should be accepted.

The internal consistency represented by coefficient Alpha, of all items is as much as 0.7510. It reports the existence of cohesive internal relationships of all measurements in representing the information technology used and this result provides confidence that statistical results produced are coming from a stable measurement source.

The first component represents the most contributory elements to the use of information technology. Alpha value of this factor is 0.7310 representing internal consistency of this component. The Alpha value of the second factor is 0.6200, which is very low owing to the very limited number items (3 items). The Alpha value of the third factor is 0.3370, which is very low owing to the very limited number of items (2 items).

Factor analysis led fourteen questionnaire statements into three components 1-5, 9, 11-13; 6, 7, 10 and 8, 14, form factors 1, 2 and 3 respectively (Table 4). These factors contribute to the explanation in student information technology variable (49.27%) of total variance.

The first component represents the most influential element on IT at a figure of 24.55% of total variance explained. It signifies the group of items measuring use of IT for course activity, library resources, in-class requirement, writing documents for coursework, e-mail, blogging, creating spread sheets (excel, etc.), presentations (power point, etc.) and creating web pages. This tells us that the respondents perceived the items in this group as one factor. Alpha value of this factor was 0.7310 representing a high internal consistency of this component.

IT could be explained by the second factor, 14.49% of the total variance in this study. The items under this group depict the use of IT in playing computer games, web-based music or videos and participation in online social networks (face book, you tube, and .com etc.). The result shows that respondents perceived all types of
entertainment as one factor when exposed during use. The reliability analysis reports 0.6200 as the Alpha value, which is over the acceptable criterion.

6. CONCLUSIONS AND IMPLICATIONS

The most important outcome of this study was to understand the importance of the use of information technology in higher education in Saudi Arabian universities: we have a positive and optimistic view about IT value to improve student access and to enhance the quality of teaching and learning. The use of information technologies can assist and encourage universities to address the challenges of the information society with changing demands for education and knowledge. Information technologies can also assist universities to be innovative and responsive to the changing demands of students and the changing requirements of business and industry from higher education.

We have identified a number of issues arising from the increasing use of information technologies in university teaching, administration and research for students:

- Communication and information technologies can allow more flexible access to university study reducing barriers of time and place of study;
- Communication and information technologies can enhance choice for students;
- Student ownership of access to computers, software and Internet services will become a significant component of course costs in an increasing on-line study environment; and
- Student contact with lectures and tutors is changing with the use of e-mail and computer based communication such as computer conferencing, with implications for student learning and staff workloads.

For Staff:

- Use of information technologies has the potential of enhancing the quality of university teaching and research; and
- Use of information technologies in university teaching and learning changes traditional teaching roles through a new focus on teaching and learning teams and instructional designers;

For Universities:

- These technologies offer Saudi universities the means to continue their world leadership status in terms of innovation in distance education and open learning at the university;
- The introduction of educational technologies requires that universities should make a significant investment in the establishment and maintenance of information technologies to support teaching, research and administration, with implications for public funding;
- The use of information technology can mean significant savings in resources with a shift from physical to virtual resources (lecture halls and libraries to on-line services) and with a shift in the relative allocation of resources for course development and for teaching; and
- The shift from printed to electronic copies in library collections has significant implications for copyright, and universities are already facing significant administrative complexity and anticipate rising costs for access to and use of these information resources.

Incorporation of information technology in education:

The use of information technology is of primary importance in education. Its use in education has two basic reasons. First: the students will become familiar with information technology and this would be helpful for their future as well as in getting jobs. The second advantage is that the teaching standards will improve and will be effective.
With the society increasingly becoming dependent on information technology and the processing of every work with it, it is important for every individual to have basic knowledge about information technology. The educational institutes should make sure that IT qualifications are developed by means of their incorporation in all activities in the education sector and each individual student must have an active and critical attitude to developments and not submissively allow technological development to set the pace.

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