Competency of Teachers in Using Technology Based on ISTE NETS.T in Tatweer Schools- Saudi Arabia

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Introduction

As technology advances, schools should also react and change to incorporate technology appropriately. In fact, in the last 20 years, technology, especially Web 2.0 tools, has dramatically affected how people communicate and learn (Solomon & Schrum, 2007). Technology has given teachers more opportunities to design more engaging learning environments that help students succeed. Studies have supported the positive effects of technology on student engagement and learning, such as searching for information easily, promoting self-expression and creativity, and constructing deep knowledge through collaboration and sharing with others (Erickson, 2010; Johnson, 2011; Thill, 2011; Yoon & Wang, 2014).

Erickson (2010) examined the use of blogs as a tool for improving open-response writing in the secondary science classes compared to handwritten dialogue journals. Four classes were equally divided into an experimental group using the blog and a traditional group using the traditional journal (Erickson, 2010). Results indicated that the blog group had a significantly more positive attitude about the experience than the dialogue journal group. Students indicated that that blogging was fun and helpful and made them look forward to science class (Erickson, 2010).

Initiatives of Using Technology in K-12 Education in Saudi Arabia

Technology uses in education has been expanded in the last three decades in Saudi Arabia. Starting in the early 1990s, educational technology uses, especially computers, were limited to administrative purposes, lesson planning, writing assignments and reports, and other classroom management activities (Alshumaim & Alhassan, n.d.). To support the spread of computer literacy among the new generation, the Ministry of Education established many computer clubs in several cities (Al-Mezher, 2006). In 1999-2000 school year, the Ministry of Education decided to change school libraries into educational learning centers that were connected to the internet and equipped with computers, projectors, and other multimedia (Al-Mezher, 2006). Later, computer literacy programs as a compulsory subject in the secondary school curriculum were introduced where schools were gradually equipped with a computer lab and teachers were trained (Al-Mezher, 2006; Alshumaim & Alhassan, n.d.).

In 2010, the Ministry of Education and King Abdullah bin Abdulaziz Public Education Development Project (Tatweer) signed a contract with the Microsoft worldwide program - “Partner in Learning”, which aimed to support the ministry and Tatweer efforts to develop education through ICT integration. This partnership focused on training policy makers, school leaders, and teachers to gain knowledge and skills in integrating Information and Communication Technology in the learning process. The training focused on several tools including Microsoft software, like Microsoft office, Microsoft publisher, Microsoft Auto Collage, Live Sky Drive, Bing Search, Microsoft Mathematics 4.0, Microsoft Movie Maker, Microsoft Photosynth, and Microsoft OneNote.

King Abdullah bin Abdulaziz Education Development Project (Tatweer)

In reaction to the increasing criticism to the Saudi curricula and continues calls from stakeholders to improve the whole educational system in the country, the Saudi Council of Ministers launched King Abdullah bin Abdulaziz Public Education Development Project (Tatweer) at the beginning of 2007. Tatweer is an Arabic term, simply means reform. Unlike the previous reform initiatives, Tatweer adopts a comprehensive systemic change in the Saudi education system. In addition to curriculum development, others educational aspects are addressed, including developing educational standards and assessment to fit the 21st century needs, improving professional
development, and enhancing school environment to promote learning (Hakami, 2010). In general, Schools are considered as the building block for reforming the Saudi education in Tatweer project.

Tatweer schools new curriculum emphasizes using new educational technologies to support students’ collaboration work with community involvement to help them possess 21st century skills (Tatweer, n.d.). As technology is one of the building blocks in this new school system and to help the schools move forward standing on a concrete base, it is important to investigate the competency of Tatweer school teachers in using technology based on the International Society for Technology in Education (ISTE) National Educational Technology Standards for Teachers (NETS.T) widely accepted technology standards, especially neither formal nor informal study has been conducted to examine the use of educational technology in Saudi Arabia in relation to these standards.

International Society for Technology in Education National Educational Technology Standards

The International Society for Technology in Education (ISTE) is the premier membership organization for educators and educational leaders (About ISTE, 2011). ISTE promotes professional development, innovation, and advancing the effective use of technology PK-12. More than 100,000 members come from across the globe. ISTE is the home of the National Educational Technology Standards (NETS), the Center for Applied Research in Educational Technology (CARET), and the National Educational Computing Conference (NECC).

National Educational Technology Standards (NETS) have served as a guideline since 1998 for improved learning and teaching through the proper technology integration (Standards for global learning in the digital age, 2011). NETS have been widely adopted by U.S. educators and increasingly advocated in countries worldwide. Aiming to integrate technology across all curricula, NETS are used to help technology planning and curriculum development across primary and secondary school settings. ISTE recently led an international project involving thousands of educators and education leaders to update the NETS. The project resulted in updated standards:

- National Educational Technology Standards for Students (NETS.S): The skills and knowledge students need to learn effectively and live productively in a digital world (NETS for students, 2007).
- National Educational Technology Standards for Teachers (NETS.T): The skills and knowledge educators need to change the way they teach, the way they work, and the way they learn in an increasingly connected global and digital society (NETS for students, 2007).
- National Educational Technology Standards for Administrators (NETS.A): The skills and knowledge school administrators and leaders need to lead and sustain a culture that supports digital-age learning, builds a vision for technology infusion, and transforms the instructional landscape (Standards for global learning in the digital age, 2011, para. 2).

The National Educational Technology Standards for Teachers (NETS.T) has been around for more than a decade. However, little research is found in the literature about teacher use of technology in light of NTES.T. Sam (2011) examined how urban middle school teachers described their competence in the 2008 NETS.T and how they describe their use of technology to support teaching and learning. Participants included 45 teachers responded to the quantitative survey instruments and 18 teachers participated in the three focus interview groups representing three (private, charter, and public) middle schools. Urban middle school teachers in this study were found not aware of the important role technology can play in preparing students for the 21st century. In addition, teachers were “not fully competent in the NETS.T, nor have they used them as a basis to design 21" century lessons. The data show that
among the three classifications of schools, urban public school teachers were less aware of the NETS.T (Sam, 2011, p. 114). The researchers suggested further studies are needed to investigate high and elementary school teacher competence NETS.T and their use of technology to support teaching and learning.

Using multi-stage cluster sampling of all K-12 public school teachers in New Jersey, Bergacs (2008) studied teacher perceptions of the alignment of their practices in using technology with NETS.T. Results found that 144 participating teachers’ technology use was adhering to NETS.T (Bergacs, 2008). While no differences were found between different teaching experience groups, differences were found significant between different subject area groups in the adherence of teacher use of technology to NETS.T. Results indicated that there were significant differences between grade level groups in their technology use in light of NETS.T, with lower grades had lower mean scores than higher grades. The research found a significant difference between respondent groups who knew about, read, and understand the standards before the survey and those who did not (Bergacs, 2008).

Statement of the Problem

While the National Education Technology Standards for Teachers developed by International Society for Technology in Education (ISTE) has worked as a guide for teachers in technology implementation, lack of research that relates technology use to the National Education Technology Standards for Teachers is apparent in the literature. More precisely, no study could be found in the literature that examined teacher use of technology in light of the National Education Technology Standards for Teachers in Saudi Arabia.

Significance of the Study

Through examining teachers’ uses of technology in light of ISTE NETS.T, this study provides information to stakeholders in the Saudi education system, particularly since Tatweer schools are an indicator of the readiness of Saudi schools to implement technology assisted- progressive education that supports learner-centered approach. Also, with the increase in the use of emerging technologies in Saudi schools, this study provides a better understanding of how technology can support the learning process, as well as to assist in making modifications in the school environment and to develop better professional development for teachers based on a formal needs assessment. Such information could serve in determining how teachers use a standards-based approach to utilize technology in their teaching.

Methodology

Population and Sampling Issues

As the leading model of the Saudi schools reform most recent initiative, Tatweer schools were found the best fit for the study goals, especially since the framework of the schools adopts a learner-centered approach with technology integration. Tatweer schools started in 2007 with 50 pilot schools nationwide and were expanded gradually. In 2012-2013 there were 30 Tatweer schools in Jeddah directorate. These schools were equally divided according to levels (elementary, intermediate, high) and genders (15 boys’ schools and 15 girls’ schools). The whole population (1073 teachers: 578 male and 495 female) was surveyed.

Data Collection

To administer the data collection process, a paper-and-pencil cross-sectional survey was used as it was distributed at the participating schools by the researcher. The survey contains 10 closed-ended items representing using educational technology based on the ISTE NETS.T and its performance indicators (NETS for teachers, 2008). The survey in this study uses a 4-point Likert-type rating scale, ranging from “strongly agree” to “strongly disagree”.

Validity and Reliability

To insure instrument’s content validity and appropriateness to study goals, an expert panel group was conducted. The 640 valid responses were found highly reliable as the Cornbach’s alpha value for this instrument was $\alpha = .95$. 106
Results

Table 1 ISTE NETS for Teachers: Mean, Media, Mode, and Standard Deviation

<table>
<thead>
<tr>
<th></th>
<th>Collaborative knowledge construction</th>
<th>Personalizing learning activities</th>
<th>Exploring real-world issues</th>
<th>Designing Relevant learning</th>
<th>Practicing safe and legal use of technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>Valid 640</td>
<td>640</td>
<td>640</td>
<td>640</td>
<td>640</td>
</tr>
<tr>
<td>Missing</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Mean</td>
<td>3.2172</td>
<td>3.0828</td>
<td>2.9938</td>
<td>2.8625</td>
<td>2.8438</td>
</tr>
<tr>
<td>Median</td>
<td>3.0000</td>
<td>3.0000</td>
<td>3.0000</td>
<td>3.0000</td>
<td>3.0000</td>
</tr>
<tr>
<td>Mode</td>
<td>3.00</td>
<td>3.00</td>
<td>3.00</td>
<td>3.00</td>
<td>3.00</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>.77602</td>
<td>.83789</td>
<td>.80294</td>
<td>.83159</td>
<td>.82258</td>
</tr>
</tbody>
</table>

Table 2 ISTE NETS for Teachers: Mean, Media, Mode, and Standard Deviation (Cont.)

<table>
<thead>
<tr>
<th></th>
<th>selecting technology effectively and productively</th>
<th>Sharing best uses of technology with PBL</th>
<th>Communicating relative info with students, parents, peers</th>
<th>Locating, organizing, analyzing, evaluating information</th>
<th>Interaction, collaboration, and publishing</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>Valid 640</td>
<td>640</td>
<td>640</td>
<td>640</td>
<td>640</td>
</tr>
<tr>
<td>Missing</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Mean</td>
<td>2.9359</td>
<td>2.8813</td>
<td>2.9000</td>
<td>2.9609</td>
<td>2.8234</td>
</tr>
<tr>
<td>Median</td>
<td>3.0000</td>
<td>3.0000</td>
<td>3.0000</td>
<td>3.0000</td>
<td>3.0000</td>
</tr>
<tr>
<td>Mode</td>
<td>3.00</td>
<td>3.00</td>
<td>3.00</td>
<td>3.00</td>
<td>3.00</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>.79353</td>
<td>.83261</td>
<td>.86272</td>
<td>.82605</td>
<td>.87304</td>
</tr>
</tbody>
</table>

Data Analysis and Discussion

Descriptive analysis, through reporting the mean, median, mode, standard deviation, and frequencies, was utilized to summarize the use of the ISTE NETS.T in Tatweer classrooms. Overall results showed good use of technology by Tatweer teachers based on ISTE NETS.T. The most frequent response found in all items was “Somewhat Agree”. The highest use of technology by Tatweer teachers found was “using technology in teaching to model collaborative knowledge construction by engaging in learning with students, colleagues, and others” (M= 3.22, SD= .78). This use of technology included the growth of social networking tools, such as Facebook and Twitter, among Saudis in recent years. Utilizing these technologies in educational activities is very significant progress in Saudi education. The least use of technology by Tatweer teachers was in “using technology in teaching to help students to interact, collaborate, and publish with peers, experts, or others employing a variety of digital environments and media” (M= 2.82, SD= .87). Although this use was the lowest, it had a very good mean, which still reflected the alignment of Tatweer school teacher technology use with ISTE NETS.T, but with more variations, which might indicate school differences in technology use. Overall findings reflected the alignment of Tatweer school teacher technology use with ISTE NETS.T, which provides an indication of the positive impacts of the recent initiatives of the Ministry of Education to integrate educational technology into Saudi education.

Conclusion

As recommendations were developed from study findings in Tatweer schools in Jeddah, only, findings generalizability is limited. Teachers can use technology for improving the learning process through creating differentiated instructions to fulfill students need and meet individual learning styles. In addition, meaningful learning requires students to work collaboratively in knowledge construction through solving authentic problems that involves finding, organizing, and analyzing data, synthesizing information, and making decisions, which can be done in more productive and effective ways with the proper use of technology. Therefore, a standards-based approach to technology use in learning, based on ISTE NETS in professional development should focus on preparing teachers to use technology purposefully in the classrooms to develop student cognitive skills. In addition, stakeholders and change agents need to understand that for successful technology-assisted learning implementation teachers should be supported through offering ongoing and appropriate professional development programs. Recommendations for future studies included conducting similar study on other schools like private schools, which
are known to have better learning environment and technology facilities. Moreover, a qualitative study through a series of focus groups of selected Jeddah Tatweer school teachers is recommended to gain a deeper understanding of using technology uses to support a meaningful learning.

References


