Technology Leadership in Saudi Higher Education

Sharene Lee,
English Lecturer
University of Ha’il
ABSTRACT

As most other modern nations, Saudi Arabia has prioritized information technology in education. Leaders and planners realize the need for training in order for technology integration to take place in education. While national development programs like ‘Tatweer’ have been introduced in primary and secondary schools, tertiary institutions have been left to running their own independent professional development programs, with mixed results. However, for the most part, technology in the classroom is still the exception rather than the rule. Where is the disconnect?

There are several important issues that prevent effective technology training in higher education, including the diversified and semi-autonomous nature of higher education, a fundamental misunderstanding of what is required to lead technology integration efforts and a lack of focus on attitudinal changes in training programs. To address these issues, this paper suggests overarching objectives and training principles to guide the development of training programs. This paper goes on to provide a step-by-step model for professional development in higher education that can be adapted to meet the needs of individual institutions.

INTRODUCTION

The Kingdom of Saudi Arabia has prioritized information technology in national development, as evidenced by its 5 year national development plans. To this end, the Saudi government has earmarked US$30 million to upgrading its science and technology infrastructure in the current developmental cycle (University World News, 2009). Based on the National Communications and Information Technology Plan (NCITP) of 1426h (2005), education is identified as one of the key sectors for IT development. “The fourth general objective of the NCITP long-term vision seeks to secure the best possible utilization of ICT in education and training at all levels.” (NCITP, p.42) As part of the implementation process, professional training for education-related staff is emphasized.

However, most local researchers have noted that technology use in the classroom is still the exception rather than the rule. And for those individuals and institutions that do use technology, adoption is still in the early stages (Al-Shawi & Al-Wabil, 2012; Al-Kahtani, 2010; Al-Maini, 2011).
Where is the disconnect? We have the technology but teachers are either not using it or not using it optimally. Clearly, realizing the NCITP objective of “best possible utilization of ICT in education” has been more difficult than anticipated, particularly in the context of higher education. On one hand, the benchmarks for “best possible utilization” are not clearly defined; nor do there currently exist a set of national standards against which technology integration can be measured. Fortunately, national organizations like the “National Center for E-Learning” are currently leading efforts in developing such standards; something which is beyond the scope of this paper.

Our discussion focuses on the paucity of professional training that has been widely recognized by most in the field as a primary reason for the slow adoption rate of technology use in higher education. Unlike the national “Tatweer” program in primary and secondary education, the Ministry of Higher Education (MOHE) has not introduced anything similar to provide standardized professional development for higher education faculty. One reason for this is the diversified and semi-autonomous nature of higher education institutions in the Kingdom. Universities and institutions of higher education across the kingdom are left to running their own professional development programs. Another important barrier to successful technology training is a fundamental misunderstanding of senior university leadership of how technology integration should take place. The current focus ignores the need for specialists in educational technology, rather than general IT specialists, to lead training and integration efforts. As a result, there is a disconnect between technology, pedagogy, and content, which undermines effective training efforts. Leadership has also overlooked the need to facilitate positive attitudinal changes toward technology, a key element in the process of IT integration in Saudi Arabia, where cultural and religious sentiment has often retarded integration efforts. (Al-Maini, p.479, 2011; Al-Kahtani & Al-Haider, p. 156, 2010)

Before effective professional development in technology integration can take place, the factors that have thus far impeded effective training must be identified and examined then subsequently addressed in training efforts. From this, a set of general principles can be delineated to guide institutions in the development of technology integration training programs for faculty in higher education. This paper attempts to do this and to suggest a model of professional development that various institutions of higher education can adapt to their needs.

Note on Terminology

In this paper, any reference to training and professional development refers to training in the effective integration of educational technology in learning and instruction in higher education. Effective integration refers to the improvement of learning outcomes as a direct result of the use of technology, whereby the same cannot be achieved by non-tech means. Effective integration
also refers to the use of technology in advancing the learning of 21st century skills, such as critical thinking and problem solving, communication, collaboration, information media and technology skills. (Grunwald Associates, LLC, p.7, 2010; Ertmer & Ottenbreit-Leftwich, 2009)

**BARRIERS TO EFFECTIVE TECHNOLOGY TRAINING IN HIGHER EDUCATION**

**Higher Education in the Kingdom: Diversified and Semi-Autonomous**

Higher education, in particular universities, in the Kingdom is modeled after American-style higher education (MOHE website). This implies a diversified and decentralized system, whereby the sum makes up the whole. Saudi universities have a free hand in crafting their own institutional vision and determining their goals. In fact, each university maintains its own 5-year plan and annual budget based on allocations made by the Ministry of Higher Education (The General Department of Educational Research and Studies, 2004, p.62). This is not to imply that Saudi higher education is as deregulated as its American counterpart; nonetheless, Saudi universities do enjoy a high degree of autonomy in determining and implementing institutional priorities that impact technology integration and faculty development. (MOHE website) The key mechanisms that impact professional development programs are faculty recruitment and budgetary allocations.

The rules for faculty recruitment set out by the Higher Education Council are not stringent and allow for flexibility. (Higher Education Council, 1997). Faculty recruitment is conducted by universities and is largely independent of central governance by the MOHE. Within the institution, each department often makes its own hiring decisions that are forwarded to higher administration for approval. The situation is further complicated by human resource needs and location.

Consequently, the faculty in any given institution of higher education in the Kingdom tends to be very diverse, both demographically and in terms of training and qualifications. (Al-Shawi & Al-Wabil, 2012) This creates a problem for professional development programs since there is no baseline from which to launch. Not only does faculty vary in technology skills but also in attitudes toward the use of technology in the classroom. (Al-Maini, p.479, 2011) In addition, most university faculty are selected based on higher degrees held in their particular fields. An instructor in the math department inevitably has a higher degree in mathematics or some related field. Most faculty are not trained teachers and have no formal training in teaching methodology. (Al-Maini, p.478, 2011) Hence, university instructors are often lacking in basic pedagogy skills, let alone how to use technology effectively in the classroom. This presents yet another challenge for professional development: how to embed technology training into a broader pedagogical context.
Institutional priorities are often indicated by budgetary allocations. While the MOHE ultimately decides how much money a particular public institution gets (private institution have their own funding sources), it does not determine how the money is spent. Hence, it is not reasonable to expect a standardized program of technology professional development to be implemented given the differing budgetary allocations put toward professional development by various institutions. In addition, institutions are at varying stages of development and have different resources, contexts, and priorities; hence this situation precludes a national program for standardized training.

**Higher Education Technology Leadership: A Fundamental Misunderstanding**

Lack of support from leadership is often cited as one of the reasons teachers fail to embrace technology in class (Al-Shumaim, 2010; Al-Kahtani & Al-Haider, p.164, 2010). One of the NCITP implementation policies states that institutions should “consider knowledge of ICT basics a factor in screening for admission or promotion in educational institutes.” (NCITP, p.43) However, support from leadership should be wider in scope to include creating incentives and allocating time for faculty professional development. Faculty will not pursue professional development opportunities if they are not provided appropriate incentives or if they do not find the time for it. In addition, institutional priorities play a part in the rate of adoption and demonstrated commitment by institutional leadership will bolster individual faculty effort. (Al-Kahtani & Al-Haider, 2010)

Going beyond, senior administrative leadership has largely misunderstood the type of personnel required to lead technology integration efforts. With rare exceptions, educational technology professionals are not on staff in the majority of higher-ed institutions in the nation (based on a survey of existing departments in higher-ed institutions and recruitment ads). It can be inferred that technology integration efforts are left to general IT professionals rather than those with specialized training in educational technology. While IT professionals can be relied on to impart technical knowledge on educational technologies, they lack the pedagogical knowledge necessary for effective integration in classroom teaching and learning. It is widely acknowledged that technology training without grounding in content and pedagogy will not result in effective use of technology in the classroom (Koehler & Mishra, 2005; Al-Shawi & Al-Wabil, 2012). Hence it is imperative that a shift of paradigm takes place at the leadership level. Leadership must move beyond the mistaken belief that technical knowledge equates effective use in the classroom. The training process needs to be carefully managed by educational technologists and specialists who have a background in technology, pedagogy, and content.

**Attitudinal Changes: The Cornerstone of Technology Training in Higher Education**
Change is most often met with resistance. In their research on educational technology use in Saudi Arabia, Al-Kahtani (2010) and Alshumaim (2010) describe teacher attitudes and perceptions toward technology as being determining factors in the adoption of technology in teaching. Some teachers fear technology because of their own inexperience or because they feel that their roles as teachers are threatened by it. (Hussein, 2011, p.51) Yet others are daunted by the speed at which technology changes and feel exasperation in being unable to keep up (Alshumaim & Al-Hassan, 2010; Niederhauser & Wessling, p.39, 2011). In Saudi Arabia, the fear of external cultural influences potentially introduced through technology use further retards technology adoption efforts. (Al-Maini, 2011; Al-Kahtani & Al-Haider, 2010) Because most faculty members are not digital-natives, they have not experienced much technology in their own education and they often do not see the utility of technology in teaching (An & Riegeluth, 2011). These negative attitudes toward technology in teaching are a formidable barrier against technology integration efforts. As Al-Kahtani (2010) points out, simply having access to technology rarely ensures use, and much less, effective use. Given the diverse nature of teaching in higher education, technology integration will not occur without faculty support and is unlikely to be successful if forced upon teaching staff. Use will only occur when teachers are motivated and see the benefits in using technology in their classrooms. Hence, any technology integration effort must address attitudinal changes as a cornerstone of technology training. Leaders in higher-ed must be willing to devote the necessary resources in securing attitudinal changes, and not only in imparting technical skills, in order to bolster technology integration efforts.

TECHNOLOGY PROFESSIONAL DEVELOPMENT:
GENERAL OBJECTIVES

The following is a set of overarching training objectives that address the barriers to effective technology training outlined above. These objectives should serve as the basis of any technology professional development program and should guide technology leaders in program development.

Objective 1. Facilitate positive attitudinal changes toward technology.

Effective use of technology in learning and teaching does in fact change the role of teachers from being the “sage on the stage” to being the “guide on the side”, from being the provider of knowledge to becoming the facilitator of learning opportunities whereby students acquire knowledge on their own. (Ertmer & Ottenbreit-Leftwich, 2009) Hence, when technology is used effectively in the classroom, it enables constructivist learning (An & Riegeluth, 2011) that develops students’ higher cognitive skills. Because technology evolves rapidly, a successful training program should focus on the “habits of mind and dispositions” (Niederhauser & Wessling, p.39, 2010) rather than on technical skills tied to a particular piece of technology. Instead of fearing technology,
teachers should understand that technology is simply a tool that they must wield in classrooms of the future. Technology will not replace them; rather it simply changes the role they play in the classroom and enables a wider variety of teaching methods. Teachers should also understand that technology is NOT culturally-neutral but both shapes and is shaped by culture. (Provenzo, Brett & McCloskey, 2004) This knowledge should make them smarter consumers of technology and allow them to make better cultural choices when selecting technologies for use in the classroom.

Objective 2. Teachers to effectively integrate available technology into learning and instruction by linking technology use to pedagogy and content.

‘Effective’ implies that technology is used in ways that improve learning outcomes and not simply used as new ways to achieve the same outcomes. ‘Available’ refers to technology that is readily at hand and does not require extraneous efforts to obtain and use. Different institutions have different resources and it is imperative that technology training provides teachers with the practical ability to use what is available rather than theoretical knowledge which cannot be put into use. ‘Learning and instruction’ implies that technology is used not only in instruction (i.e. delivery) but also in learning, something done by students. Hence, not only should teachers use technology but so should students to both learn with and as a means to demonstrate learning. Technology use in learning and instruction can only be effective if it is informed by appropriate pedagogy and content (Koehler & Mishra, 2005; An & Reigeluth, 2011). Hence it is a key objective to not only impart technical skills but also to align them to pedagogy and content. For example, if training teachers to use PowerPoint presentations in the classroom, it is insufficient to only show teachers how to create a presentation; it is also imperative that they be trained on why PowerPoints should be used, which features of a visual presentation best engage students and how best to present material in their specific content area.

Objective 3. Teachers to use technology to promote the learning of 21st century skills.

21st century skills “include familiar and timeless skills for navigating life and work environments, as well as new and different kinds of skills that are particularly relevant in a competitive global economy.” (Grunwald and Associates, p.5, 2010) They include critical thinking and problem solving, communication, collaboration, creativity and innovation, information, media and technology skills among others. (Grunwald and Associates, p.7, 2010) As much as technology is a part of 21st century skills, it also supports the learning of other 21st century skills. For instance, Web 2.0 is all about sharing and collaboration. Technology has enabled collaborative learning in ways previously unimaginable. Collaborative learning incorporates the collective knowledge and experiences of a given group of people, which makes for a richer and more
meaningful learning experience. In fact, researchers have suggested forming learning networks that motivate participants and provide support outside of formal training (An & Reigeluth, p.61, 2011) Hence one of the main aims of using technology in the classroom is to enable and promote collaborative learning, a key 21st century skill.

**TRAINING PRINCIPLES**

With the aforementioned objectives in mind, we can proceed to developing a framework for training programs based on four fundamental principles as outlined below.

**Training Principle 1. Prioritize and commit to the long run.**

Technology leaders must prioritize training, which means allocating time and resources to professional development. Lack of time is often cited as an important obstacle to technology integration (Al-Kahtani & Al-Haider, 2010). Because technology training goes beyond just learning new techniques and involves self-reflection and attitudinal changes, it must be viewed as a long-term developmental process that requires a substantial amount of time. Ideally, as proposed by some researchers, “professional development should be embedded in the daily work life of teachers.”(Cook, 1997) Teachers must be given time off for training sessions and incentives must be provided. These can include monetary incentives based on successful completion of training and demonstrated technology use in the classroom, promotions tied to the same, free meals and refreshments at training sessions, or simply written or verbal acknowledgement and appreciation for participation in training sessions. Technology leaders must also commit to the long run and realize that technology integration is a long process that requires not only ongoing training but ongoing post-training support and evaluation as well. (Niederhauser & Wessling, p.38, 2011) This is necessary to gauge the successes and shortcomings of training programs and to adjust to the needs of training participants.

**Training Principle 2. Customize training and address the needs of participants by conducting a thorough needs analysis prior to the design of the training program.**

Once training begins, continue to adjust to the needs of the participants.

A sure way to de-motivate participants is by imposing on them training for something which they either already know or see no need in learning. Hence it is important to conduct a thorough needs analysis to determine teacher attitudes and aptitudes. The training program designer must be careful to identify the most prevalent attitudinal changes that need to take place and the skills and understandings that teachers are most in need of acquiring. It is recommended that training is conducted in modules such that participants are able to select modules that are most relevant to them and to begin at a skill level that is appropriate (Pace, 2012).

**Training Principle 3. Use constructivist approaches, collaborative learning, and mixed methods in technology training.**
Some of the primary aims of using technology in the classroom is to enable constructivist approaches to learning (Ertmer & Ottenbreit-Leftwich, 2009), to encourage collaborative learning, and to allow for a variety of learning methods for individuals with varying learning styles. In order to convince training participants of the efficacy of technology in achieving these aims, their own technology training should model these principles. Hence, constructivist approaches, learning by doing, should be applied to the training program. Rather than being shown how to use a piece of technology, participants should ideally work on an authentic project requiring them to use a particular technology in a particular way in the classroom, thereby learning about the technology by using it. Participants should learn collaboratively and work on projects in groups. This encourages participants to bring in their particular expertise and to share successful teaching practices and experiences in technology use. Training modules should use a variety of teaching methods that emphasize various learning styles to allow participants to experience different ways of learning.

Training Principle 4. Provide an urgent need and meaningful uses for technology.

Participants are more motivated to learn when they have a need or reason to. Demonstrate how a professional or personal need can be met with technology. Get them “hooked on technology (Dimock, 1996).” Make technology use an integral part of classroom teaching or student assessment (i.e. through changes in course curriculum) so that teachers will have an urgent need to learn about it and find immediate and meaningful uses for what they are learning. It is encouraged for administrators to adjust courses and assessments to include technological components to create a need for training. Even better, give teachers opportunities to participate in the shaping of curriculum by incorporating newly acquired understandings of technology integration.

■ STEP BY STEP: A MODEL OF TECHNOLOGY PROFESSIONAL DEVELOPMENT

Step 1. Selecting your technology leadership team.

Technology integration leaders must not only possess technical skills but also a strong understanding of pedagogy and instructional design. (Estep, 2003) Content experts are needed as well but can be drawn from existing faculty. A small group of individuals with complimentary expertise is an ideal leadership structure. Educational technologists or instructional designers should make up the core leadership group with support from IT specialists and content experts. Educational technologists can identify best possible uses of available technology and design training programs to support technology, pedagogy, and content. Educational technologists can consult with IT specialists and content experts to fill in the gaps in program design.

Step 2. Perform a thorough needs analysis.

Training design is dependent on multiple factors, including available resources (time, money,
classroom space, computers, trainers, etc.), institutional priorities (for example, technical colleges have different priorities than research universities), student needs and preferences (populations in larger metropolitan areas tend welcome technology in learning more than populations in rural areas), and faculty attitudes and aptitudes. A thorough needs analysis through analyzing existing data or collecting new quantitative and qualitative data will help the technology leadership team identify the most salient issues that should guide training program design.

**Step 3. Determine specific program objectives based on needs analysis.**

In order for any instructional or training program to succeed, it is important to know what constitutes success. Hence detailed and specific objectives must be identified based on the results of the completed needs analysis. These objectives should begin from the overarching program objectives specified above and branch out to more specific objectives particular to the institution.

**Step 4. Develop a modular program based on specific objectives and participant needs.**

As mentioned previously, a modular program is ideal in providing choice as well as to cater to participants with varying levels of technology proficiency, attitudes toward technology integration, pedagogical tendencies, content area, and resources. A modular program also allows for flexibility in addressing time and location constraints.

**Step 5. Develop program materials, including evaluation instruments.**

A variety of different program materials should be developed to support a mixed methods approach. Materials can include learning guides, online tutorials, informational websites, audio/visual presentations, and any other formats that support learning objectives and varied learning styles. It is very important that assessment and evaluation instruments be developed at this point as well. This will guide trainers in developing a logical sequence of activities to build up to completion of the final assessment project.

**Step 6. Obtain participant buy-in and support through proper communication of program aims and incentives.**

Prior to commencement of the training program, participant buy-in and support should be secured through open communication of the program aims and incentives. Participants should be convinced of the utility and need for the training program. Securing internal support from faculty members already using technology successfully is important, since they, as members of the participant group, will present a positive perspective on training that will be met with less skepticism. The training program must be presented as something that is beneficial to the individual participant in order to begin the process of attitudinal change.

**Step 7. Develop learning networks and identify internal technology champions and mentors.**
Learning about technology is an ongoing process that requires ongoing support. By creating learning networks and teams, participants will have access to support groups that will help them when they are frustrated or bored with the training process. In addition, peer teaching is an essential part of sustaining and expanding technology use by teachers (Dimock, 1996). It is also important that these learning networks emphasize collaboration and support rather than competition, since we want membership to encourage continued participation in the training program. Training program leaders should plan how members of a learning network should interact and specify clear objectives for each learning team. Depending on the needs of the participants, learning teams can be grouped by technology proficiency level, pedagogic style, content area, or some suitable combination. Participants who are already using technology successfully should be recruited to be internal technology champions and mentors to learning networks and teams.

**Step 8. Launch training program, instruction and assessment.**

One of the most important aspects of any training program is participant assessment. A training program is only successful if participants actually acquire the skills that are being taught. And the only way to determine this is to conduct formative and summative assessments. In the case of technology use in the classroom, demonstrative projects tend to be the best form of assessment. Having participants demonstrate the use of a particular technology for a particular context and content area is usually a reliable assessment format.

**Step 9. Ongoing evaluation and support.**

Once training is underway, program leaders must be careful to listen and respond to ongoing feedback from participants. Program leaders must not be afraid to make adjustments to training modules and content if they see validity in participant feedback. After the completion of training, participants should receive ongoing support in their individual implementation efforts. Participants should be encouraged to continue participation in learning networks by sharing successful experiences and lessons learned.
Conclusion

Professional technology training has been identified by the National Communications and IT Plan (NCITP) as a key implementation policy in the overall aim of technology integration in education. However, given the diverse nature of higher education in Saudi Arabia, technology training hasn’t been an easy task. The barriers to successful technology training include diversified governance in higher-ed, a misunderstanding of the personnel required for IT leadership in higher-ed, and ignoring the facilitation of attitudinal changes in training. In an effort to address these issues, a number of overarching objectives and training principles have been described and a model for professional development proposed. While the objectives and training principles are meant to be universal, the model should rightfully be adapted to the needs of individual institutions and be used as a starting point in planning technology professional development.
References


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