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ABSTRACT

Many national and provincial initiatives are underway to specify the technology skills that students must demonstrate at each grade level. The Government of the Province of Alberta in Canada has mandated the implementation of a new curriculum beginning in September 2000 called the "Information and Communication Technology Program of Studies." This curriculum is infused within core courses and specifies what students are "expected to know, be able to do, and be like with respect to technology" (Alberta Learning, 2000). Since teachers are required to implement this new curriculum, school jurisdictions are turning to professional development strategies and hiring standards to meet this goal. This paper summarizes the results of a telephone survey administered to all public school jurisdictions in the Province of Alberta with a 100% response rate. Examined were the computer skills that school jurisdictions require of newly hired and currently employed teachers. Implications of standards are discussed. (Author/AEF)

A Survey of Current Computer Skill Standards and Implications for Teacher Education

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Abstract: Many national and provincial initiatives are underway to specify the technology skills that students must demonstrate at each grade level. The Government of the Province of Alberta in Canada has mandated the implementation of a new curriculum beginning in September 2000 called the *Information and Communication Technology Program of Studies*. This curriculum is infused within core courses and specifies what students are "expected to know, be able to do, and be like with respect to technology" (Alberta Learning, 2000). Since teachers are required to implement this new curriculum, school jurisdictions are turning to professional development strategies and hiring standards to meet this goal. This paper summarizes the results of a telephone survey administered to all public school jurisdictions in the Province of Alberta with a 100% response rate. We examined the computer skills that school jurisdictions require of newly hired and currently employed teachers and discuss the implications of standards.

Background

Various government authorities have recognized that Information and Communications Technology (ICT) has a major impact on our economy. The Alberta Science and Research Authority (1998) acknowledges that ICT is "the world's strongest, fastest growing economic sector" and the Government of Canada (2000) recognizes that "Canada can benefit by becoming a world leader in the development and use of advanced information and communications technologies." Furthermore, the U.S. Department of Education (2000) has realized that technology is transforming the American economy. As a result, these authorities are pursuing initiatives to incorporate technology into K-12 schools not only to prepare students for this new economy, but also because they see the "potential for technology to transform the teaching and learning experience" (U.S. Department of Education).

One initiative making an impact in the K-12 school system in Alberta is the integration of technology into the classroom. Beginning in September of 2000, Alberta Learning has mandated a new curriculum called the *Information and Communication Technology (ICT) Program of Studies*, which is to be infused within core courses and specifies what students are "expected to know, be able to do, and be like with respect to technology" (Alberta Learning, 2000). Since trained teachers are required to carry out this new curriculum, school administrators are turning to professional development strategies and hiring standards are being revised to meet this goal. This study examines the computer skill requirements of newly hired teachers reports any plans by school jurisdictions to implement changes in policy.

The Study

Purpose

The developments in technology over the past few years have influenced expectations by governments, school jurisdictions, teachers, parents, and students. Schools are being asked to prepare students to use technology in the 21st century. Since teachers are vital to an integration plan, they have been under pressure to learn and incorporate technology skills into their teaching. The purpose of this study is to become familiar with the current status of computer skills required for teachers being hired by school jurisdictions in Alberta, so the Faculty of Education at the University of Alberta can try to improve the match between the needed skills identified by the respondents of this study and the curriculum being offered. Whether school jurisdictions planned to change their computing skill requirements in the immediate future is investigated including what those changes might be.

Method

In January 2000, a letter explaining the purpose of the study was sent to the superintendents of each of the public, separate, and francophone school jurisdictions in Alberta with an attached interview guide. The superintendents were asked to nominate an appropriate person for participation in a 10-minute telephone interview. The designated respondents were then sent a copy of the contact letter along with the interview guide to provide them with an opportunity to review and prepare their responses. From February to April, participants were contacted by telephone to obtain informed consent for their voluntary participation in the structured telephone interview. A 100% response rate was obtained from the 60 representatives, one from each school jurisdiction. They included 17 superintendents, 22 assistant superintendents, 12 technology coordinators, 5 human resources representatives, and 4 other individuals who were nominated by the superintendent.

Limitations

Two limitations were identified during the study. First, participants' interpretation of requirements differed. While some considered only written policy to be a requirement, others had definitions of requirements that consisted of only expectations. To address this issue, the categories, "no, but expected" and "no, but ask in interview" were included in the coding of responses. The second limitation involved the sample of participants. Because participants differed in job position, they are likely to have different perspectives on hiring policy and/or different degrees of familiarity with applicant profiles. Furthermore, participants are likely to have different degrees of experience with technology, which would influence their interpretation of technology preparedness. No correction, however, could be made for this limitation.

Findings

Current Computer Skill Requirements for Newly Hired Teachers

The respondents were asked whether their jurisdiction had mandatory computer skill requirements for newly hired teachers. Seven respondents indicated that they did have such requirements, but three of these said they were minimal. One respondent stated: "Well, it's kind of an odd situation. We do have – we would have requirements. Unfortunately, they don't come with them, and so we have to hire and then train on their own. Many of them don't come with it." The other 53 respondents indicated that their jurisdiction did not require computer skills from their newly hired teachers. Of these respondents, 20 reported that while computer skills were not required, prospective teachers were asked if they had these skills during the interview. One respondent best summarized this: "We do, however, ask questions with regard to their level of competency in dealing with technology, and it is more or less a subjective as opposed to objective list of criteria." Twenty-two respondents indicated that while computer skills were not required, they were expected and were seen as an important asset. One typical respondent in this group said: "I think there is a general level of expectation related to that. For example, we would not place advertisement in any Alberta newspaper for a teaching vacancy that did not include some reference to our need to hire people with these skills." While it is important to note that the vast majority of respondents indicated that computer skills were viewed as very important, a few indicated that other skills and knowledge were more important than computer skills. One such respondent stated: "With an elementary generalist, computer skills is not a requirement and it would not be

the decision-maker as to whether we hire or not. There would be many other things that would be more important to us in that hiring decision."

Expected Changes in Computer Skill Requirements for Newly Hired Teachers

We asked the respondents, who indicated their jurisdiction did not require computer skills from prospective teachers, whether their jurisdiction planned on introducing such a requirement. While five respondents said their school jurisdiction planned to implement such requirements, one did not know if they were being pursued and 28 responded that there were no plans to employ requirements. The jurisdictions that planned to introduce requirements were not at a stage where they could describe their proposal, but one respondent summarized the general tone that they were going to "step up the volume, so to speak," in what they would require from new teachers and computer skill requirements." The respondents, who said there were no plans for requirements, raised specific issues about requirements. These issues are well represented by the following quotations: 1) "The only time we would ask for specific skills with regard to technology would be when we're looking for teachers who are going to be teaching in the CTS area – especially in that area," 2) "I think the question that our board is asking is - the resources that we put into technology – are they making a difference for student learning?" and 3) "I still believe strongly that give me a teacher with a good attitude and I can teach them the rest, so no, I would not choose a candidate who has high computer skills over a candidate who demonstrates a very positive attitude."

Nineteen respondents indicated that they would like to implement such standards, but identified some reason why they could not do so. The majority of these respondents indicated they would experience trouble finding applicants with these skills:

> "We'd like to [implement requirements]. It would be pretty darn hard to do so. ... I'll tell you, though, that if we have got an applicant who has got that kind of knowledge – that instructional knowledge in how to use multimedia tools and such – digital cameras, scanners, you name it – they would certainly have a definite edge in employment over anyone else. At this stage, we could not require that, and, you know, demand a certificate, for example, or even coursework in that area, because we certainly wouldn't get the applicants."

Another respondent, however, felt applicants met their expectations: "In general, we are finding that the majority of teachers coming to us now have the skills we need in terms of basic computer use and are comfortable with it." In this case, the respondent indicated that her/his jurisdiction was interested in basic skills such as being able to use e-mail and word processing.

What Kinds of Computer Skills are Required or Expected?

We asked the respondents to identify what kinds of computer skills they required or expected their teachers to have. Fifty-five of the 60 respondents answered this question and each respondent could give multiple answers. Of the 55 respondents, 50 identified "basic skills" as required. Basic skills were generally defined as being able to utilize word processors, spreadsheets, databases, presentation software, and the Internet. Twenty-eight respondents indicated that knowledge of technology integration into the curriculum was also required and five identified subject-specific skills. One respondent described the challenge in specifying skills: "I guess part of the difficulty is you are trying to draw a line in the sand in the middle of a sandstorm because the line is going to keep moving."

The issue of what kind of computer skills teachers should have was one of the areas that created the most divergence in answers. All 28 of the respondents, who included technology integration in their list of skills, also indicated they understood that to do this their teachers would need a command of basic computer skills; however, 22 respondents did not indicate that their teachers needed more than basic computer skills. Many of those who said teachers needed to be able to integrate technology into the curriculum felt very strongly about this point. One respondent said, "we're really looking for people who can build this bridge between technological expertise and helping kids learn better, more effectively, more quickly than previously." Another respondent from a jurisdiction that requires computing skills outlined their teacher performance expectation that

> "the teacher utilizes computer technology successfully to assist in the delivery, enrichment, remediation, and monitoring of student learning. This would include content presentation, delivery and research applications, enrichment and remediation where appropriate, word processing, information management and record keeping, and electronic network usage. The extent to which technology is utilized will vary depending on the age of the students and the availability of hardware and software."

The respondent went on to state that hardware and software were "very available" in that jurisdiction. A different respondent was quite specific that

> "particularly for new people who are entering the field of teaching, I think it is not unrealistic to expect that they have complete familiarity with technology and are able to have a comfort level – certainly how they integrate it into the instructional process, I think is part of the training that they go through in university and in the actual experience that they receive in the schools, but I think they should have a general familiarity with operating systems, programs, etc., and should be comfortable with technology as opposed to afraid of it."

It must be noted that a few respondents were much less positive about the need for teachers to have computer skills. A statement from one respondent summarized this view: "My whole point is that the verdict is still out has technology really improved learning for students? ... We spent all this money and that on the technology, and do we really see better teaching and better learning that's going on? I don't know. I hope so."

Issues and Implications for Policy and Practice

A number of issues emerged from this study that have implications for both policy and practice. These issues will provide a foundation for future discussion about the implementation of standards and inform school administrators about the current state of hiring policy in the province of Alberta.

Preservice Teacher Education

Extent of Preparation

Several respondents suggested that it is not unrealistic to expect that universities should be graduating students who have "complete familiarity with technology and how to integrate it" within the curriculum. While this perception is shared among many of the respondents, there is a difference in opinion as to whether universities are fulfilling this role. The responses vary from the view that "many applicants do not come with requirements so we have to hire and train them" to those who believe "universities have skill requirements for graduates which are going to essentially allow us to put something down on paper saying this is what you need to teach here." Those respondents who were more critical of the extent to which universities prepared teachers to use technology indicated that the "courses being offered were not keying in on curriculum integration." Regardless of the expectation of the extent of technology preparation at universities, respondents often reported that "the more [graduates] have when they come, the less we have to train and the better we feel that they would be," and, furthermore, "it would save [jurisdictions] a fairly large cost in terms of professional development."

A few jurisdictions are taking advantage of student teachers and new teachers who are placed in the school. One respondent said "we have used student teachers on practicum to actually come out and act as peer tutors with some of our teachers to upgrade their technical skills," and another said, "of course, we expect [new teachers] to be [more skilled] and hopefully they are, so they are the ones who can turn around and help the older teachers." Not all respondents, however, were happy with the level of knowledge student teachers had with regard to integration of technology into the curriculum. One respondent summarized this concern, "we had student teachers out here and I talked about integration of technology into the curriculum and they said – they were on their last practicum – and they said 'we don't know anything about that.' I said, 'oh, that's interesting.' So, then I guess my thought is as superintendent is well, now we even have to train those coming out of university."

Hiring Standards

Written Policy vs. "De facto" Requirements

Any discussion of ICT curriculum and requirements for students must eventually lead to dialogue about the implementation of that curriculum with reference to requirements for teachers. Our study found that some school jurisdictions have their requirements for teachers written into public policy, whereas others instead held "de facto" requirements. In the latter case, although policy requirements were not implemented, there may still be implications for teachers who do not meet expectations. One respondent, who said computer skills are not required at this point in time, summarizes the de facto requirement: "What we're trying to do is provide opportunities for the teachers to t forcing the teachers to do so, but with the understanding that more and more administrators are looking for those skills, so if they don't upgrade then their opportunity for placement or

Whether requirements are written in policy or not, it is important for school administrators to get "a clear sense of [their] own expectations for technology-using educators if [they] are to prepare future teachers for appropriate use of technology in their classrooms" (Gillingham & Topper, 1999). The benefit of using written policy to communicate those expectations would be the consistency of those requirements across a school jurisdiction. Most respondents made note that the hiring process is now site-based as opposed to centralized and the implementation and/or enforcement of requirements for teachers are often at the discretion of the principal. For example, one respondent asked, "Is there a sense of understanding that many of the inservice requirements and the hiring practices have moved to school sites?" Written policy would also communicate those expectations explicitly to universities offering teacher education programs, so that preservice teachers can be better prepared for their placements after graduation.

In contrast, the implementation of policy requirements may have a negative effect on the needs of the teachers learning technology. For example, schools may have different needs and obstacles to meeting requirements. One respondent summarized this point: "We looked at our own unique needs for our teachers ... So, I think any school that has technology, and all do, have different provisions for their teachers to access information and support."

The Need for Standards

There is much debate about whether there should be standards for computer use for students and teachers. In Alberta, where this study was undertaken, the government has mandated the *ICT Program of Studies* for students. Almost universally, respondents acknowledged that this was one of the major reasons (in some cases, it was the only reason mentioned) for their jurisdiction introducing technology skill requirements or expectations for their teachers. No one complained that the ICT Program of Studies had been implemented. Some commented that the government had taken too long implementing these standards or had mismanaged their introduction:

> "I would say the implementation of technology in the classroom would be the single most bungled educational initiative in Alberta if not the world over the last 20 years, and I think it's only now we're figuring out what this is really about. This can work for us and work well with enough resources if we continue to focus on the connection between technology and learning."

Consensus seemed to be that standards for students had been mandated and their schools were complying. However, questions seemed to emerge around issue of teacher standards: Should all teachers have ICT skills? What level of skills was necessary? Should teachers learn how to integrate technology in their teaching? Should older teachers be "grandfathered" and only new teachers be required to meet certain standards? Without a mandated standard for teachers, jurisdictions are answering each of these questions differently.

Technology standards for teachers have been created (ISTE Accreditation and Standards Committee, 1996) and in areas like California (Swofford, 1999) standards have been mandated for new teachers only. It may be that the solution to many of the questions raised above may entail the mandatory implementation of standards in the province for both new and existing teachers.

Conclusion

The eventual success or failure of any computing initiative is shaped by the individual teacher (Collis, 1996). To preserve financial investments in technology infrastructure and to prepare students for the new economy of the 21st century, school administrators must look to teacher training and technology standards. Since administrators and teachers are entering new territory with respect to technology implementation, it became apparent that many respondents were eager to know what other school jurisdictions were doing with respect to professional development and hiring standards. This is evidenced by the 100% response rate that was obtained. Many participants provided additional supportive comments about the pursuit of research in this area. For example, one respondent said, "Well, may I say right off the top that I'm really pleased this is being done, because this is an area t you are taking this initiative." Further research is recommended in this area to begin to address some of the specific themes and questions identified by this study.

References

Alberta Learning (2000). Information and Communication Technology Program of Studies. Retrieved October 26, 2000 from the World Wide Web: http://ednet.edc.gov.ab.ca/ict/pofs.asp

Alberta Science and Research Authority (1998). A Strategy for Information and Communications Technology in Alberta. Retrieved October 26, 2000 from the World Wide Web: http://www.gov.ab.ca/sra/publicdocs/ict/ICTtoc.html

Collis, B. (1996). The Internet as an educational innovation: Lessons from experience with computer implementation. Educational Technology, 36(6), 21-30.

Gillingham, M.G., & Topper, A. (1999). Technology in teacher preparation: Preparing teachers for the future. Journal of Technology and Teacher Education, 7(4), 303-321.

Government of Canada (2000). Connecting Canadians. Retrieved October 26, 2000 from the World Wide Web: http://www.connect.gc.ca/en/100-e.htm

ISTE Accreditation and Standards Committee (1996). National Standards for Technology in Teacher Preparation. Retrieved October 26, 2000 from the World Wide Web: http://www.iste.org/standards/ncate/intro.html

Swofford, S. W. (1999). New Technology Standards, including a Plan for the Implementation of Programs to Meet the New Technology Standards. (Coded Correspondence 99-9916). Sacramento, CA: California Commission on Teacher Credentialing. Retrieved March 20, 2000 from the World Wide Web: http://www.ctc.ca.gov/codcor.doc/999916/999916.html

United States Department of Education (2000). Revising the 1996 National Educational Technology Plan. Washington, DC: Author. Retrieved October 26, 2000 from the World Wide Web: http://www.air.org/forum/

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