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Technology Expectations for Future Teachers

Tim Carter, Ph.D., Arkansas Tech University

Linda Bean, Ed.D., Arkansas Tech University

Mary Gunter, Ed.D., Arkansas Tech University

Adam Reeves, B.S., Arkansas Tech University

Technology Expectations for Future Teachers

Tim Carter, Ph.D., Arkansas Tech University

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Abstract

This study explores the technology applications, resources, and tools used by school districts in a 23-county region in northwest Arkansas. A college of education research team surveyed school principals working within this region and attained a response rate of 27% with total responses from 104 participants. Results indicate important findings that should be considered by colleges of education as faculty seek to prepare future teachers in the area of technology.

Introduction

According to the International Telecommunication Union (ITU) (2015), world use of the Internet increased from 400 million users to 3.2 billion users during the years 2000 to 2015. This increase allowed opportunities for individuals to access an ever-increasing amount of information and to interact with various types of information in novel ways. In support of these findings, the United States' Federal Communication Commission (FCC) (2016) noted that Internet usage in the United States grew 9% from December 2013 to December 2014 to reach 321 million users. Much of this growth is reported by the FCC as being due to increased mobile

usage for Internet access that grew 13% from December 2013 to 2014. Additional growth occurred through a fixed connection usage increase of 2% during this same time period.

To meet this growing demand for Internet connectivity in recent years, commercial providers have introduced numerous products across multiple platforms. As indication of this growth in its most recent product review, Consumer Reports (2016) reviewed 94 recently-developed computers and laptops designed by companies such as Acer/Gateway, Apple, Asus, Dell, HP/Compaq, Lenovo, Samsung, and Toshiba. The computers and laptops ranged in size from tablet to desktop across iOS and PC platforms with various processing speeds and storage capabilities and with different specialty features. In the same report, Consumer Reports (2016) identified and reviewed 48 recently-designed smartphones across multiple platforms. The platforms included Android, Fire OS (Amazon), iOS, and WP (Windows). Each of these smartphones allows ease of access to and use of Internet resources, tools, and applications.

With these increased Internet gateways through mobile and fixed connection means, classroom teachers in P-12 schools are now encountering students with access to various web tools and experiences who may enter their classrooms with different expectations of the learning environment. Based on prior experiences, students are likely to expect greater interactions with Internet learning games, tools, searches, archives, audiovisual presentations, and assessments as well as other learning opportunities across various hardware and software platforms.

Due to these changes in both technology access and stakeholder expectations including learner expectations, various educational groups and states cite the importance of technology use and access explicitly and/or implicitly in their recent standards and efforts for learning improvement. For example, the Next Generation Science Standards Lead States (2013) note that technology use should be infused within the learning of science and that a proactive approach should be followed to ensure that technology use informs and strengthens science exploration. In Arkansas, the Arkansas Department of Education (ADE) (2016a) currently includes a division within the department devoted solely to the improved use of technology in schools, districts, and classrooms. In addition, the ADE (2016b) recently approved 41 digital providers to offer instruction via Internet and encouraged broader digital learning efforts.

The emphasis and reliance upon the Internet in a variety of environments are expected to increase within the United States and world populations in the near future. By 2020, in the United States alone, Internet usage is expected to increase by 20 million users (eMarketer, n.d.). In addition, the ITU (2015) has continued to report exponential growth in worldwide Internet usage in recent years as developing countries gain greater access to the Internet, which is expected to increase in the future as Internet access improves.

According to Richardson, Flora, and Bathon (2013), such changes place immense pressure on classroom teachers and educational leaders, including school principals, that require new considerations of the learning environment and the ways that effective instruction in a web-based world should occur. Further, as Hutchison and Woodward (2014) report, changes in standards and expectations for technology use have shifted the use of technology from a preference to a requirement in many learning situations. Much of this change is driven by the expectations of external stakeholders (i.e., standards groups, companies, government agencies, etc.).

As related to internal stakeholders (learners), within the current generation, classroom teachers and educational leaders in Arkansas and around the world will be interacting with learners with life-experiences where Internet use is rapidly increasing and mobile Internet access has outpaced wired or fixed connection access. Such transitions are requiring and will require a

response from today's classroom teachers in the implementation of various technological resources in an effective manner. In addition, these changes necessitate that faculty in colleges of education prepare teachers who are capable of effectively managing and using evolving technologies to ensure increased student learning.

To help prepare teachers for this evolving environment, the following study was conducted. The purpose of this study was to determine the tools and platforms that are most commonly used for classroom and school purposes in a large number of schools in a particular region of Arkansas. This region encompasses the classrooms and schools where the university's teacher education candidates complete field experiences and internships as well as where most graduates are employed. By understanding the tools and platforms used and through providing increased training in the use of these tools and platforms, it is believed that teacher education candidates will be better prepared to participate effectively in the schools and districts within this particular region.

Method

Participants

The participants in this study included school principals from 23 counties in the northwest quadrant of Arkansas. The 23 counties represented in this geographic sample included Baxter, Benton, Boone, Carroll, Conway, Crawford, Franklin, Garland, Johnson, Logan, Marion, Madison, Montgomery, Newton, Perry, Polk, Pope, Scott, Searcy, Sebastian, Van Buren, Washington, and Yell. The survey was administered to 386 school principals. Of this group, 104 principals participating providing a 27% response rate. This sample of 104 principals included 53 principals at the elementary, 19 principals at the middle, and 32 principals at the secondary school levels across 59 school districts within the northwest region of the state.

Instrument and Procedure

The research team designed a survey using the QuestionPro survey software tool that could be administered to participants electronically via an email link. The team used the most recent Arkansas Department of Education administrator listing to access email addresses for the principals within respective schools in the 23-county region. For principals and email addresses that were incorrect, the team completed phone and web searches to ensure that the correct principal and email address information was obtained. After completing the list, an email was distributed initially to the principals early in the fall 2015 semester requesting their participation, describing the purposes of the study, and providing them with a link to the survey within QuestionPro. The team emailed the survey individually to each principal to avoid the email being rejected by filters or blockers at local schools. After receiving the initial email survey link, participants were allowed two weeks to respond to the survey and were sent a reminder one week following the first email requesting participation.

The survey contained 15 items involving diverse aspects of technology use, platforms, and resources within the respective school. Some items on the survey were selected response, and others were open response. Example items included, "Please list the types of interactive game or poll-based products utilized in your classrooms (i.e., Kahoot, Poll Everywhere, Cool Math, etc.)," "Are the students at your school encouraged to use cell phones for instruction and/or assessment purposes in the classroom?" "What projection tools/software are used in your

classroom or school?” and “Of the following, what tablet devices does your school use? Please select all that apply.”

Design and Analysis

A descriptive survey design was used in the study. Data were analyzed using Excel via the QuestionPro software program. For survey items, responses were tallied to provide the extent of usage for software and hardware platforms and availability of technology resources for the schools in this 23-county region of northwest Arkansas.

Results

The results indicated some strong similarities in technology aspects within the schools participating in the study. Other results indicated strong differences in technology aspects within these same schools. The 15 items and the principals’ responses are discussed below individually or are grouped where appropriate.

Item 1 on the survey involved demographic information concerning the school where the participant was employed. The data indicated that approximately 59 districts were represented within this 23-county region.

Item 2 requested information regarding the tablet or device the school used. Participant responses indicated that the iPad and Chromebook were the most popular tablets used in the schools sampled with 86 and 80 participants reporting their uses respectively. This popularity in use was followed by the Lenovo Notebook with 26 participants reporting use of this tool. Participants in elementary schools, middle schools, and secondary schools all reported that these tools were being used in their schools at high levels, and a large number of participants reported that both iPads and Chromebooks were being used in their schools.

Item 3 involved students’ use of cell phones for instruction and/or assessment purposes in the classroom. Participants were divided on this response. Of the 104 participants, 55% reported that students were not allowed to use their cell phones for learning and/or assessment purposes in the classroom; whereas, 45% of the participants reported that students were allowed to use cell phones for these purposes.

Item 4 queried participants about the projection tools used in their schools. The vast majority ($n = 73$) reported that the SmartBoard was the tool of choice in their schools’ classrooms. The second most used projection tools, reported by 29 of the participants, was the interactive whiteboard followed third by Promethean World reported by 22 participants.

Item 5 inquired about the participant’s school as a “Google School.” Of the 104 participants, 71% indicated that their school was a “Google School,” and 29% responded that their school was not a “Google School.”

Item 6 involved the use of interactive games or poll-based products utilized in the participant’s respective school. The most popular game was *Cool Math* reported by 14 participants followed by *Moby Max* reported by 7 participants. Additionally, 21 participants noted that their teachers used the poll-based product *Kahoot*, 16 participants noted *Poll Everywhere*, and 10 participants noted the use of *Google Forms*.

Items 7 through 9 involved online services and related Wi-Fi capabilities. Of the 104 participants, 100% reported that their schools have Wi-Fi capability, and 99% reported that the majority of their classrooms were Wi-Fi enabled. Concerning their use of Wi-Fi to provide courses via online services, 55% noted that their schools do not participate in online courses, 28% reported using online courses from Virtual Arkansas, 4% reported using services from the

Arkansas Virtual Academy, and 13% reported using services from other providers of online courses.

Items 10 through 12 related to the district's one-to-one initiative or lack thereof. Approximately 55% of the participants reported that their districts currently did not have a one-to-one initiative, and 45% reported that they did have this initiative. Of the participants reporting that they did have a one-to-one initiative in their district, the numbers of students participating increased by grade level with Kindergarten classes being reported as the least in one-to-one ($n = 17$) within the respective district to high school being the most ($n = 29$) in the district with Chromebooks being the predominantly used tool for one-to-one initiatives at different grade levels.

The final three items, items 13-15, of the survey dealt with the human resources involved in implementing various technological tools and applications within a school district. Participants were asked to denote if there was an individual designated in the district or school to assist with technology, this person's employment stature, and the title of this position. Of the 104 participants, 94% reported that there was a person designated to manage the technology within the school or district. Of this 94%, 68% were "Technology Specialists," 14% were "Staff," 8% were "Teachers," and 9% were reported as "Other."

Discussion

The purpose of the present study was to determine what technological tools, resources, and platforms were being used in a 23-county region in the Northwest quadrant of Arkansas. The study was pursued to assist faculty in one teacher education program to better understand these uses of technology in this region and to subsequently prepare teacher education candidates for this environment. The results indicated that there are several factors, tools, and platforms that should be considered when preparing future teachers.

First, it is apparent that P-12 schools in the northwest region of the state are well-equipped with Wi-Fi connections to take advantage of the evolving growth of Internet applications for the teaching and learning environment. As teachers become aware and begin to take advantage of "apps" recommended and ranked by groups such as Teach Thought (2016) and the American Library Association (2015) among others, there is, according to the school principals responding to the survey, the capability for implementation based on Wi-Fi availability within schools and nearly all classrooms.

Second, based on the sheer number of Internet applications noted by principals and within this review, it is apparent that the goals of the Arkansas Department of Education, school districts, and local schools of increasing teacher awareness and effective use of these tools are essential. Related to this emphasis, faculty in colleges of education should carefully consider ways to more effectively prepare future teachers, who will be participating in these constantly-evolving technological environments. Candidates need to be aware of such tools at *Kahoot*, *Google Forms*, *Poll Everywhere*, *Cool Math*, and *Moby Max* (among others) since these were identified as receiving the most implementation in the schools where principals responded to the survey.

Third, although principals reported a number of different technological tools and resources being used within their respective schools and districts, there were some technological tools that were clearly most popular and others that were not. For one-to-one use, most principals mentioned the use of Google Chromebooks and the use of Google tools/apps. Several factors may impact the decision to use this tool including lower prices for hardware and free

software applications. In addition, Google tools/apps may be used on Android, PC, and iOS platforms, which likely contribute to their popularity. Faculty in colleges of education would be wise to consider how to prepare teacher education candidates more effectively in the use of Google tools and resources.

Fourth, the results indicated a wide variety in both one-to-one and cell phone utilization based on the responses of surveyed principals. Apparently, the majority of classrooms have not transitioned to the use of cell phones within the teaching, learning, and assessment process. There is an obvious mismatch here between students' prior learning experiences and uses of mobile devices versus this same tool's application toward learning in the classroom. On the one hand, as mobile Internet usage has now outpaced fixed connection Internet usage, school personnel may find that they are encouraged to make cell phone applications a common part of their practices. On the other hand, school personnel may continue to use other mobile devices such as laptops and tablets to allow a "more-controlled" classroom participation with online applications of learning and assessment. In both cases, faculty in colleges of education will likely need to prepare their future teachers in the use of mobile applications involving both cell phones and other mobile devices.

Fifth, from the results of this study, it is apparent that SmartBoard usage outpaces other presentation mediums considerably within these schools and districts as indicated by school principals responding to the survey. It would benefit candidates to have access to and basic training in the use of SmartBoards if this trend remains within this region of our state.

Sixth, surprisingly, the majority of responding principals noted that their schools did not participate in online course services. The percent not participating was 55%. Of the ones that did participate, 28% used Virtual Arkansas. However, with present state and local school initiatives and with increased web usage, this number will likely increase, and in future exploration, these numbers may change substantially. It would appear that teacher education candidates would benefit from familiarity with tools such as Virtual Arkansas as they progress through their teacher education programs and prepare to teach in schools such as these.

Finally, it should be noted that this study was limited to one area of the state, albeit one where many teachers are employed who graduate from the university's teacher education programs where the research team completed this study. Although beneficial information was provided, consideration of the evolving nature of the technological environment must be considered as faculty in colleges of education continue to prepare future teachers for a rapidly-changing digital learning environment. Further, it would likely benefit faculty in colleges of education in Arkansas to understand what other regions of the state implement in the areas of technological tools and resources. This study was limited to one region of the state, which limits the generalizations that may be made for the entire state of Arkansas. Future research should explore these same questions in other regions of the state as colleges of education attempt to prepare future teachers to meet technology expectations.

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