**l.Title: Educational Technology Course Improvement for Teacher Preparation Programs**

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| *Poster Sessions:* | *Posters are designed to showcase a project, program, process, activity, or similar experience in an informal setting. Posters may be projects that are completed, in progress, or in their beginning stages. A small table is provided to support a display board, laptop, and handouts. Feedback and insights from colleagues on these innovative developments are especially encouraged. The poster size is 48” x 36” horizontal/landscape layout. Presenters will design and bring their own posters to be attached to tri-fold panels provided by AECT.* |
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**Key Words** Teacher Education & Action research

**Short Description**

The need for continuous educational technology training in teacher preparation programs requires universities to constantly improve and apply innovations in the classroom. This practical action research involves pre-service teachers, school district technology personnel, and course instructors to determine what content should be taught in educational technology courses, evaluate the level of teacher competencies, and provide recommendations for implementing effective educational technology courses.

**Abstract**

Today, educators are increasingly integrating technology across curricula (Voithofer & Nelson, 2020). However, the capacity of technology to improve student achievement depends significantly on how teachers incorporate the technology into their practice (Tamim et al., 2011). Hager (2020) points out that on top of delivering the lesson and managing students’ behavior as a novice teacher, there are numerous technological challenges for new teachers that can be difficult to manage. Teacher education programs must provide pre-service teachers with the knowledge and skills for effective use of technology in classrooms (Dong & Mertala 2019).

Recent findings show that teacher education programs need to develop more robust curricula addressing concerns (Alelaimat et al., 2020). Hager (2020) predicts that it is likely that technology used in teacher preparation programs will keep changing because technology is evolving at a rapid pace. Therefore, as major educational technology changes happen in teaching, future instructors need support, time to process, and apply their skills to new situations (Ferdig et al., 2020). While many schools have the technology, there are deficiencies in the educators’ knowledge and skills to facilitate proper instruction when it comes to using the technology for teaching.

The purpose of this study is to determine what content should be taught in pre-service teacher educational technology courses, evaluate the level of teacher competencies, and provide recommendations for implementing effective educational technology courses. This study may assist the pre-service teachers and teacher preparation programs in analyzing educational technology courses and identifying gaps between pre-service teachers’ educational technology competencies and school district expectations.

**Research Questions**

The questions to be researched in this study are as follows:

1. What content should be covered in educational technology courses for pre-service teachers?
2. What are pre-service teachers’ perceptions toward their educational technology competency levels before and after the practical action research plan?
3. What are the recommendations for implementing educational technology courses for pre-service teachers?

**Method**

**Participants**

Approximately 120 pre-service teachers enrolled in educational technology courses in an undergraduate teacher preparation program in the Rocky Mountain region will participate in the Qualtrics survey. Technology personnel from five Colorado school districts will participate in a semi-structured interview. Four graduate teaching assistants serving as the instructor of record to the educational technology courses will implement the practical action plan and reflect on their own practices.

**Instruments**

Educational technology course syllabi and Canvas modules will be collected. The educational technology course instructors will record bi-weekly journals (eight journals) reflecting on their practice while implementing the action plan. Pre-service teachers will take an online survey consisting of 21 five-point Likert scale items and two open-ended questions. Questions 1-21 ask pre-service teachers to rate their knowledge and skills of educational technology use from strongly disagree (1) to strongly agree (5). Open-ended questions 22-23 ask pre-service teachers about their views on classroom technology integration and its impact on student learning. Furthermore, school district technology personnel will be interviewed with a semi-structured protocol asking about their teacher technology integration expectations in the classroom.

**Procedures**

According to Stringer (2007), educators need to improve their practice by conducting practical action research based on the Action Research Interacting Spiral: (1) look, (2) think, and (3) Act. In order to improve the quality of educational technology curriculum and course implementation, practical research is used to identify areas of focus, collect data, develop an action plan and then analyze and interpret the findings (Creswell & Guetterman, 2019). In order to address the research questions, the researchers will conduct the research with the following steps : (1) evaluating course syllabus, Canvas learning modules, and semi-structured school district interviews prior to the Spring 2021 semester, (2) revising the existing educational technology courses curriculum prior to the Spring 2021 semester, (3) administering pre-service teacher survey (pre) at the beginning of Spring 2021, (4) implementing revised curriculum in Spring 2021, (5) compiling instructor reflection journals throughout Spring 2021, and (6) administering pre-service teacher survey (post) at the end of Spring 2021.

**Data Analysis**

To answer research question one, the researchers will conduct document analysis on the existing educational technology courses syllabi and Canvas modules. Meanwhile, The school district interview responses will be categorized, coded, and analyzed to identify trends and themes. The researcher will propose a course improvement curriculum. To answer research question two, the researchers will analyze the pre-and-post Pre-service teachers’ survey using a statistical software platform. The means and standard deviations for these survey items will be calculated and compared. Pre-service teachers’ responses to the two open-ended questions will also be categorized, coded, and analyzed to identify trends and themes. To answer research question three, the researchers will analyze the course instructors’ reflection data to provide recommendations for implementing effective educational technology courses within teacher preparation programs.

**Results**

**Syllabi and Modules.** The researchers examined the existing educational technology courses syllabi and Canvas modules with The Theories and Frameworks Ranking List and The Educational Technology Topics Ranking List (Lo et al., 2020) to align with the curriculum with preservice teachers’ prescription, school districts expectations, and current educational technology trends. The researchers included two additional topics, the learning management system and remote learning, into the intervention curriculum and merged similar topics, and removed irrelevant or overloaded assignments.

**Likert scale items.**

The pre and post survey data have shown a positive change on all 21 Likert scale items. Participants gain overall confidence with using technology in educational settings. Participants reported the most growth in using the Learning Management System, utilizing web2.0 open educational resources, and applying legal and ethical issues with technology in the classroom context.

**Opened-question.** In response to the open-ended survey questions (list ?s), the pre-survey resulted in the overwhelming theme of integration meaning technology use and providing accessibility. While the post-survey results also were heavy in the technology use theme, there was an increase in the theme of creating interactive and engaging learning experiences.

**Instructor Reflection.** According to the pre-service teacher’s feedback, the instructors felt the need to A. Reduce workload, (merging assignments together, making some aspects of an assignment optional). B. provided a wealth of examples. C. addressed motivation and expectations of this Project Based Learning / flipped classroom design, using Constructivist Theory. From these changes, we received an overwhelming change in perception and feedback from the pre-service teachers.

**Educational Implications**

The findings may help educational technology course instructors to identify the strengths and weaknesses relevant to the course curriculum. In addition, the findings may help pre-service teachers to identify gaps between their educational technology competence and school district expectations. Last, the findings of the study may offer recommendations to pre-service teacher preparation programs for more robust and effective educational technology courses.

**References**

Alelaimat, A. M., Ihmeideh, F. M. & Alkhawaldeh, M. F. (2020). Preparing preservice teachers for technology and digital Media integration: Implications for early childhood teacher education programs. *International Journal of Early Childhood*, *52*, 299–317 <https://doi.org/10.1007/s13158-020-00276-2>

Creswell, J. W., & Guetterman, T. C. (2019). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research*. Pearson Education, Inc.

Dong, C., & Mertala, P. (2019). It is a tool, but not a ‘must’: Early childhood preservice teachers’ perceptions of ICT and its affordances. *Early Years*, 1-16, <https://doi-org.unco.idm.oclc.org/10.1080/09575146.2019.1627293>.

Ferdig, R. E., Baumgartner, E., Hartshorne, R., Kaplan-Rakowski, R. & Mouza, C. (Eds.), (2020). *Teaching, technology, and teacher education during the COVID-19 pandemic: Stories from the field.* Association for the Advancement of Computing in Education. Retrieved November 16, 2020, from <https://www-learntechlib-org.unco.idm.oclc.org/p/216903/>

Hager, K. D. (2020). Integrating technology to improve teacher preparation. *College Teaching*, *68*(2), 71-78, DOI: 10.1080/87567555.2020.1723475

Lo, W., Wachter, E., Alrmuny, D., Edaye, Y., and Ku H. Y. (2020, November 2–7 ) *A need assessment on educational technology competencies for teachers.* [Poster Presentation]. AECT 2020 Virtual Convention. <https://aect2020-aect.ipostersessions.com/Default.aspx?s=41-04-B6-A7-39-34-A3-43-7E-E2-C4-10-34-5A-8B-9A>

Stringer, E.T. (2007) *Action Research* (3rd ed.). Thousand Oaks, Sage.

Tamim, R. M., Bernard, R. M., Borokhovski, E., Abrami, P. C., Schmid, R. F. (2011). What forty years of research says about the impact of technology on learning: A second-order meta-analysis and validation study. *Review of Educational Research*, *81*(1), 4–28. <https://doi-org.unco.idm.oclc.org/10.3102/0034654310393361>

Voithofer, R., & Nelson, M. J. (2020). Teacher educator technology integration preparation practices around TPACK in the United States. *Journal of Teacher Education*, 1-15, <https://doi.org/10.1177/0022487120949842>