

eLearning in Teacher Preparation

Karen R. Compton

University of Kentucky

Submitted in partial fulfillment of the requirements for

EDC 605

Dr. Gary Anglin

December 4, 2010

Abstract

Within the field of teacher education, several studies into eLearning have appeared over the last five years. This area of research shows that online approaches are of equivalent quality to traditional courses, and that students have positive perceptions of eLearning experiences.

Interaction appears to be an important component and may be effective in both asynchronous and synchronous formats, but careful consideration must be given to the structuring of activities.

Additionally, eLearning may provide solutions to problems specific to teacher education, including increasing diversity in enrollment, recruiting teachers for areas of critical shortage, and improving the supervision of practicum teachers. However, there are several gaps in the research, most notably in the area of assessment.

Review of Literature

The use of online learning approaches in higher education is becoming increasingly more common. With this increased use comes additional concerns and the need for research. One of the fields that is beginning to implement eLearning strategies into classes and programs is teacher preparation. Though research is available in distance education in general, and a strong base of research in educational technology, there is relatively little existing research into this specific area of teacher preparation through eLearning.

The current review of literature is limited to primary research that has been done with pre-service teachers using online approaches to instruction either as the sole approach or combined with traditional educational approaches. Some of the studies deal with issues common across various fields that utilize eLearning strategies, while others focus on issues specific to teacher training. The quality of the studies reviewed vary, and those that need to be considered very cautiously are noted. The research falls into three main categories: the merits of eLearning, design concerns, and issues specific to teacher training.

Merits of eLearning

Quality

One area of research into the use of eLearning in teacher preparation is the general merits of online learning environments. These merits have been studied in terms of quality and student satisfaction. Both are extremely important and of major concern in higher education and distance learning. However, there is little quantitative research available and only limited qualitative research. In a two-year study by Harrell (2006), no significant difference was found

between test scores on the TExES exam required for teacher certification between students who pursued their certification coursework online and those who pursued it in a traditional on-campus setting. A study by Kirtman (2009) had varying results when investigating an online course compared to the traditional version of the same course. No significant difference was found between grades on written papers, but a significant difference was found between composite test scores (mid-term and final) between the two groups with the traditional group having the higher scores. However, when t-tests were performed on the separate mid-term and final exams, only the mid-term resulted in a significant difference between the groups. When Mentzer, Cryan, & Teclehaimanot (2007) compared face-to-face with web-based versions of the same course, student performance on tests was found to be equivalent. However, the overall grades in the online course were lower due to uncompleted assignments. These results suggest that online courses have the potential to provide quality equal to that of traditional face-to-face courses, but that other issues may need to be considered in online learning.

Student Perspective

The student perspective in eLearning through self-report measurement instruments dominates much of the literature. In terms of overall satisfaction with online courses, positive ratings have been consistently found (Alger & Kopecha, 2009; Beattie, Spooner, Jordan, Algozzine, & Spooner, 2002; Braun, 2008; Collopy & Arnold, 2009; Kirtman, 2009; Knapczyk, Frey, & Wall-Marencik, 2005a). In a study by Braun (2008), students reported an overall satisfaction with online course content and instruction. Seventy-seven percent of participants rated online courses as being more demanding than traditional courses while 23% rated them as being as demanding or less demanding as traditional courses. In a comparison of an online

course and a traditional version of the same course with the same instructor, Beattie et al. (2002) found no significant difference between the two in terms of overall course ratings and instructor ratings. In a study by Knapczyk et al. (2005a), 90% of the students rated the structure of the online course as exceptional with the same percentage reporting that Oncourse provided a supportive and positive learning atmosphere. However, due to methodological issues, these results must be considered cautiously.

Some of the studies into student perspective of online learning provided additional insights and issues to consider. In another study by Knapczyk & Hew (2007), students reported needing additional time to complete weekly assignments. The same study resulted in reported difficulty with debate-oriented, text-based discussions. Kirtman (2009) found that though students reported overall positive ratings for the online course, they suggested increased discourse in large and small groups. When looking at a blended course design (face-to-face and online components) compared to an online only course design, Collopy & Arnold (2009) found higher satisfaction ratings for the blended environment in terms of team/group work. Participants in the blended course also reported their learning at a higher level than those in the online only course, as well as higher competence ratings. In Alger & Kopecha's (2009) study, all participants (practicum teachers, cooperating teachers, and university supervisors) reported the use of online forums as leading to feelings of community support, though 5 of the 18 participants reported a lack of human element in eSupervision of student teachers.

A study that looked at student perception of online learning in a different way was performed by Vonderwell & Turner (2005). The researchers looked at the effect online learning had on the students in general. The results of this qualitative study show that the participants

became more aware of their own study skills and learning styles. They also reported increased self-discipline, time management, and effectiveness in using resources.

Summary

Based on these research findings on the merits of eLearning in teacher preparation, it is clear that online learning can be effective in providing instruction. The quality of instruction appears to be at least equivalent to that of traditional courses. Additionally, student perception of online teacher education courses appears to be positive overall, and may have additional benefits to the learners. However, it is also apparent that care must be given to how courses are designed. A recurring finding was the importance of student interaction within the eLearning environment and structuring of learning activities.

Design

Much of the research done in online teacher preparation has centered on the various approaches, designs, and learning activities used in an eLearning environment. This includes interaction, as mentioned in the previous section, as well as student technology abilities. While there are no definitive answers to how to design these types of courses, the research provides useful insights into important design considerations.

Synchronous and Asynchronous

Within the design structure of online courses, the merits of synchronous and asynchronous elements have been investigated (Alger & Kopecha, 2009; Levin, He, & Robbins, 2006; Skylar, 2009). Due to increased technological capabilities, including connection speeds

and computer resources, synchronous learning activities are more widely available and may prove to be useful in teacher preparation. These elements can be implemented as text-based, video and/or audio conferencing, and in various combinations. Asynchronous elements rely greatly on text-based methods, but can include videos and podcasts.

The literature demonstrates positive aspects for both synchronous and asynchronous approaches. In a study by Levin et al. (2006) where participants alternated between asynchronous discussions and synchronous discussions throughout most of the course, the number of participants who preferred the synchronous elements increased from three (N=33) at the beginning of the course to 17 by the end of the course. The reasons given for preferences for the synchronous discussions include: convenience of a set one-hour schedule, opportunity for immediate feedback, and the pace of discussions. The reasons provided for preference of the asynchronous format, which constituted more than half of the participants, include: convenience, more time to read and respond, flexibility, and previous negative experience with online chatting. However, the participants reported that they did not like having to wait for peer responses and having too much to read in the asynchronous discussions. Despite varying preferences for the two approaches, analysis of students' critical reflections resulted in higher ratings when the case-based discussions were held synchronously. Skylar (2009) compared alternating asynchronous text-based lectures with interactive web-conferencing and found that 73% of the participants preferred the synchronous lectures and 87% felt the synchronous lectures increased their understanding of the content when combined with text-based materials. Eighty percent of the participants perceived that they performed better on weekly quizzes when the content was presented synchronously. Though mean test scores were calculated for the synchronous and asynchronous elements, no t-test was performed to establish if the differences were statistically

significant. There was a 1.5 point difference between the two groups (out of 50) with the synchronous scores being higher.

Presentation of Material

The way in which the material is presented, and the learning activities students encounter, appear important in eLearning. In a qualitative study on text-based online interactions, McCrory & Putnam (2008) found four themes that emerged as having an impact on discussions: subject matter, nature of tasks, media, and structure. Contrary to the researchers' expectations, questions involving mathematical concepts were more easily discussed and in more depth, as opposed to the pedagogical aspects of teaching math, which were discussed with little depth or true discourse. In terms of the impact of tasks, the researchers found that "the task as interpreted by the students is as important as the task as designed by the instructor" (p. 176), and that tasks are important in determining the focus and engagement of discussions. Representation of content was found to be an important factor in student engagement and related to the nature of the subject matter. The last finding of the study was the need to establish structure and routines that support student engagement due to the student-controlled nature of text-based discussions. Knapczyk (2007) found that students in an online course were successful at completing activities that were based on varying types of instructional objectives that are often used in educational methods courses. However, some methodological issues with the study could have impacted the validity.

Interaction

An aspect of online learning that is common among the literature is student interaction. Two distinct types of interaction are often considered – student-student interaction and student-instructor interaction. Levin et al. (2006) compared preference ratings for online class discussions that were peer-facilitated to those that were instructor-facilitated. Initially, out of the 36 participants, 17 reported a preference for instructor-facilitated discussions, 9 preferred peer-facilitated discussions, and 10 had no preference. When surveyed again at the end of the semester, there were no significant changes in preference ratings of the 32 remaining students. The reasons given for preference of instructor-facilitated discussions include: staying on task, deeper insights, and instructor as better equipped to facilitate. However, students reported an increased appreciation for the insights of their peers. Student who reported no preference for either format also provided feedback on the peer-facilitated discussions that included a more casual and relaxed atmosphere, as well as more flexibility in topic discussions.

A study by Annetta, Murray, Lair, Bohr, & Park (2008) investigated the preferred modes of interactions between students and the instructor. The results showed that students had a reluctance to move away from text-based discussions. They preferred to have the instructor in audio and student responses through text. Kirtman (2009), as reported earlier, received comments from students suggesting more interaction in an online course. Additionally, in a *post hoc* analysis, the researcher found no significant relationship between overall course GPA and the number of hits on the course platform, but did find a significant relationship between the GPA and the number of hits on the discussion board specifically. A methodologically questionable study by Knapczyk, Hew, & Frey (2005b) found that groups of 14-15 allowed for high levels of class discourse among students and smaller teams of 4-5 resulted in high student-

student interactions. Interestingly, the use of a starter-wrapper approach to discussion resulted in productive discussions.

Technology Skills

Another area that is of concern in eLearning that has been investigated somewhat within the teacher preparation field is the technology skills of students. The lack of a significant amount of research in this area could be due to sufficient research in distance education and eLearning in general or the common requirement of a technology class for education majors with a standard level of proficiency. The research done by Skylar (2009) included a technology component that evaluated student perception of their technology skills over the semester. The study showed a significant difference in participant pre-test and post-test survey responses on technology skills. In a study that focused on training teachers on how to use a multi-user virtual learning environment, Annetta et al. (2008) found that student products were successful despite their differing levels of technology skills.

Summary

The research into design considerations in teacher preparation through eLearning is still fairly minimal, but shows developing themes. In terms of synchronous and asynchronous activities, neither is clearly better than the other. Based on the studies by Skylar (2009) and Levin et al. (2006), synchronous activities may have benefits in terms of student performance. Preferences of students for the two approaches is variable, suggesting that a variety of approaches, and even student choice, might be beneficial. Other design considerations that appear to be important include how the subject matter, materials, tasks, and student interactions

are structured. However, more focused research is essential for a clearer understanding.

Technology seems of minor importance in this area of study, but worthy of consideration when designing eLearning for future teachers.

Issues and Potentials for eLearning in Teacher Preparation

Though there is a lot of crossover of research in teacher preparation with other areas of higher education research, some aspects are fairly unique to the training of teachers. Pre-service teachers not only must receive a variety of coursework, but must gain practical experience in schools. These potential teachers must have contact and interaction with schools, in-service teachers, and children in real-life settings. This can prove especially challenging for colleges of education, but eLearning may provide special opportunities and solutions to some of these issues. Research has been performed in the areas of teacher certification, practicum supervision, and the use of online professional development in affecting pre-service teacher preparation.

Teacher Certification

One study that provides insight into one of the potentials of eLearning in this field was performed by Harrell (2006). It investigated the implementation of an online teacher certification program in Texas and specifically looked at its effect on diversity, critical shortage areas of math and science, and program quality. When comparing the percentage enrollment of the online program to students enrolled in the traditional program, results showed 48% of males in the online program compared to 32% in the traditional, 6% of Asians versus to 2.5%, and 14% Latino compared to 8%. Overall, the online program had 28% minority enrollment compared to 18% in the traditional program. In the critical shortage areas, the online program resulted in 80

students total for math and science compared to 19 students total in the traditional program. As mentioned previously, there was no significant difference in test scores on the TExES test between the two groups and self-assessment surveys showed that the online program was of equal or better quality than that of the traditional program.

Practicum Supervision

Three studies looked at the use of eLearning in the supervision of practicum teachers and mentor teachers. The first study (Knapczyk et al., 2005a) involved three different groups of subjects – practicum teachers, mentors, and university supervisors. Results showed that in 75% of teams, the university supervisors served mainly as facilitators in online discussions. The other 25% reported that supervisors needed to take on a more assertive role. Eighty-seven percent of the practicum teachers felt interactions with their mentors were sufficient. The study also found that scheduling response times between practicum teachers and their mentors to be challenging and concluded that timely feedback is essential to the success of an eLearning approach to practicum supervision. The second study (Alger & Kopecha, 2009) into “eSupervision” of practicum teachers also investigated the dynamics between and among the same three groups of subjects. Alger & Kopecha found that, originally, the practicum teachers and mentors viewed the online components as “extra work,” but later reported many of the modules and online activities as being useful and helpful. A component that was used as an ongoing tool in the course of the study was Lesson Plan Builder, an online lesson planning tool. The study showed that this component, specifically, provided a protocol for lesson planning and created a level of accountability that is generally challenging in the supervision of practicum teachers. Of the nine student teachers, six reported an improvement in their planning skills due to the use of this

component. Another aspect in the study that proved beneficial was the use of discussion forums in which all subjects could access and participate. Student teachers reported using the forums to discuss problems and receive advice or encouragement. All of the practicum and cooperating teachers felt that the discussions resulted in a feeling of community support. In addition, the university supervisors found the forums helpful in informing their own practice.

The third study that investigated the merits of an online practicum approach did so in a unique way. Frey (2008) compared the self-assessments of two groups: (a) students who participated in a course and an online practicum experience and (b) students who participated in only the course without the additional online practicum component. Though both groups made statistically significant improvements according to the self-assessments from pre-test to post-test, the first group's (course and practicum) improvement was much higher than the second (course only). The effect size for the first group was 1.674 compared to the second group with an effect size of 1.07. Through a qualitative analysis, the author identified three critical components of the online practicum: (a) meaningful, real life learning activities, (b) collaborative learning communities involving support from peers, the instructor, and the school/sit, and (c) careful structure of the practicum experience in terms of framework, layout, timelines, and expectations.

Real World Connections

The final area of eLearning research in teacher preparation is the use of a web-based professional development system to help train pre-service teachers. Barnett (2006) used Inquiry Learning Forum to connect these pre-service teachers to current teachers and real-life practice. Students were able to watch videos of in-service teachers in action and discuss the issues that arose. The pre-service teachers reported highly valuing the videos and interactions, as well as

gaining greater understanding of learning theories and reform-based teaching practice. As with several other studies reviewed, Barnett also found that the structure was of the utmost importance.

Summary

The research in eLearning in teacher preparation shows several areas of possibility for drastic effects on the field. Based on the studies reviewed, there is immense potential to increase diversity in teacher recruitment, increase teachers in critical shortage areas, make real-world connections for pre-service teachers, and change the way in which practicum supervision is performed. It is possible that eLearning in teacher preparation may become an essential component of programs rather than just an alternative to traditional classrooms.

Conclusion

Research of teacher preparation through eLearning is fairly new. Sixteen out of the seventeen studies reviewed were done in the last 5 years. They have attempted to establish whether online learning is an appropriate and equivalent form of preparation for future teachers in terms of quality and perception. Based on the studies reviewed, this seems to have been established. The literature has also dealt with design concerns for the online courses and is still in the early stages of creating a profile of appropriate practices. It seems clear, however, that both asynchronous and synchronous learning are appropriate and important aspects to consider, especially in terms of sufficient and appropriate student interactions. It is also clear that designing the materials, learning activities, and student interactions is extremely important for the success of eLearning approaches. McCrory & Putnam (2008) suggested that because

students have more control over the discussions, and because their interpretations of tasks are essential in the results of the learning activities, that careful structure is even more important in eLearning than in traditional classes. Though the research into issues specific to teacher training, those that were reviewed give insight into the potentials of eLearning strategies. There needs to be additional research into these approaches, as well as additional innovative ways to implement eLearning that can truly impact the field.

There are several areas of need in the research that are essential in the future. The first one is increased quality of research. The majority of the studies reviewed were mostly based on qualitative methodologies and surveys as data sources. Though qualitative research can be valuable in examining a field, quality methodology is of the utmost importance along with appropriate interpretation of the results. Several of the qualitative studies reviewed were not of the highest quality. Additionally, the use of surveys can provide some insight, but lack the specific data needed at this point. As for quantitative research, there were very few studies in the literature. However, the ones reviewed were of an acceptable quality. The specific area of research that seemed to be absent from the literature was assessment and outcome-based data. There is an immense amount of research to be done on assessment, including the logistics of assessment, best practices, and alignment with online-specific instructional design.

References

- Alger, C., & Kopecha, T. J. (2009). eSupervision: a technology framework for the 21st century field experience in teacher education. *Issues in Teacher Education, 18*(2), 31-46.
- Annetta, L., Murray, M., Lair, S. G., Bohr, S., & Park, J. (2008). Investigating student attitudes toward a synchronous online graduate course in a multi-user virtual learning environment. *Journal of Technology and Teacher Education, 16*(1), 5-34.
- Barnett, M. (2006). Using a web-based professional development system to support preservice teachers in examining authentic classroom practice. *Journal of Technology and Teacher Education 14*(4), 701-729.
- Beattie, J., Spooner, F., Jordan, L., Algozzine, B., & Spooner, M. (2002). Evaluating instruction in distance learning classes. *Teacher Education and Special Education: The Journal of the Teacher Education Division of the Council for Exceptional Children, 25*, 124-132.
- Braun, T. (2008). Making a choice: the perceptions and attitudes of online graduate students. *Journal of Technology and Teacher Education, 16*(1), 63-92.
- Collopy, R. M., & Arnold, J. M. (2009). To blend or not to blend: learning environments in undergraduate teacher education. *Issues in Teacher Education, 18*(2), 85-
- Frey, T. (2008). Determining the impact of online practicum facilitation for inservice teachers. *Journal of Technology and Teacher Education, 16*(2), 181-210.
- Harrell, P. E. (2006). Teacher preparation without boundaries: a two-year study of an online teacher certification program. *Journal of Technology and Teacher Education, 14*(4), 755-774.
- Knapczyk, D. R., Frey, T. J., & Wall-Marencik, W. (2005a). An evaluation of web conferencing in online teacher preparation. *Teacher Education and Special Education, 28*(2), 114-124.

- Knapczyk, D. R., Hew, K. F., & Frey, T. J. (2005b). Evaluation of online mentoring of practicum for limited licensed teachers. *Teacher Education and Special Education*, 28(3/4), 207-220.
- Knapczyk, D. R., & Hew, K. F. (2007). An analysis and evaluation of online instructional activities. *Teacher Education and Special Education*, 30(3), 167-182.
- Kirtman, L. (2009). Online versus in-class courses: an examination of differences in learning outcomes. *Issues in Teacher Education*, 18(2), 103-116.
- Levin, B. B., He, Y., & Robbins, H. H. (2006). Comparative analysis of preservice teachers' reflective thinking in synchronous versus asynchronous online case discussions. *Journal of Technology and Teacher Education*, 14(3), 439-460.
- McCrary, R., & Putnam, R. (2008). Interaction in online courses for teacher education: subject matter and pedagogy. *Journal of Technology and Teacher Education*, 16(2), 155-180.
- Mentzer, G. A., Cryan, J., & Teclehaimanot, B. (2007). Two peas in a pod? A comparison of face-to-face and web-based classrooms. *Journal of Technology and Teacher Education*, 15(2), 233-246.
- Skylar, A. A. (2009). A comparison of asynchronous online text-based lectures and synchronous interactive web conferencing lectures. *Issues in Teacher Education*, 18(2), 69-84.
- Vonderwell, S., & Turner, S. (2005). Active learning and preservice teachers' experiences in an online course: a case study. *Journal of Technology and Teacher Education* 13(1), 65-84.