Educational Considerations

Volume 31 | Number 2 Article 6

4-1-2004

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Recommended Citation

Wetig, Saundra L. and Adcock, Phyllis K. (2004) "Technology Integration in Professional Education Courses: Utilizing the INTASC Principles," *Educational Considerations*: Vol. 31: No. 2. https://doi.org/10.4148/0146-9282.1256

Technology Integration in Professional Education Courses: Utilizing the INTASC Principles

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Introduction

In response to emerging federal, state, and local standards, the University of Nebraska at Omaha through the Teacher Education Department strives to equip teacher candidates with the academic, social, as well as the technological skills needed in 21st century classrooms. The teacher preparation program provides teacher candidates with a systematic, experience-based approach to develop the requisite knowledge, skills, and dispositions which align with local, state, and federal standards relating to curriculum structure and content knowledge.

After the most recent National Council for Accreditation in Teacher Education (NCATE) accreditation visit, the College of Education Teacher Education Department reviewed the professional sequence of courses, known as the E-Core courses, to determine what cognitive knowledge, skills, dispositions, and technology competencies were embedded in those courses. The E-Core faculty worked to then align those knowledge, skills, and dispositions, required of teacher education candidates, with the NCATE Standards and Interstate New Teacher Assessment and Support Consortium (INTASC) Principles.

More recently, the department chairperson brought the team leaders of the E-Core faculty and the technology support staff together to discuss how NCATE and the INTASC Principles have impacted those courses. The discussion centered on the course expectations, requirements, and technology integration in the five E-Core education courses. The E-Core team looked specifically at the cognitive and technological knowledge, skills, and dispositions included in the five educational core courses required of all COE students: (1) EDUC 2010 Human Growth and Learning; (2) EDUC 2020 Educational Foundations; (3) EDUC 2030 Human Relations; (4) EDUC 2510 Applied Special Education; and (5) EDUC 2520 Instructional Systems.

Once the cognitive and technological competencies were identified, the E-Core team determined that some type of exit assessment was needed to document teacher candidates' cognitive growth and technological competence in relation to the INTASC Principles. It was then they decided to utilize the ten INTASC Principles to provide the framework to document progress of the teacher candidates' knowledge, skills, and dispositions to serve as a form of exit assessment of teacher preparation. Concurrently, the technology support staff developed an online digital portfolio that E-Core titled the Digital Showcase. This digital portfolio includes a summary of each of the INTASC Principles and a scoring rubric for the teacher candidates. Therefore E-Core faculty members are able to document and record the individual teacher candidate's progress as they correlate to the INTASC Principles. (See Table 1.)

Table 1

INTASC Principles and Supporting Course Activities Table

University of Nebraska-Omaha

Principle 1: Content Knowledge	**EDUC 2020** Teacher Interview **EDUC 2520** Unit Teaching Plan (K-12th grade)
Principle 2: Learner Development	**EDUC 2010** Non-traditional Remote Observation Technology
Principle 3: Diversity of Learners	**EDUC 2510** Modification/Adaptation of a Lesson Plan for a Special Needs Student
Principle 4: Instructional Strategies	**EDUC 2520** Unit Teaching Plan (K-12th grade) EDUC 2520-004 Schema Representations via Inspiration
Principle 5: Learning Environment	**EDUC 2010** 5 Level Observation Form **EDUC 2030** Forum/Image Theatre
Principle 6: Communication	**EDUC 2510** Modification/Adaptation of Lesson Plan for a Special Needs Student
Principle 7: Planning for Instruction	**EDUC 2020** Philosophy of Education **EDUC 2520** Unit Teaching Plan (K-12th grade)
Principle 8: Assessment	**EDUC 2510** Checklist for Special Needs Identification
Principle 9: Reflective Practice and Professional Development	**EDUC 2020** Pre/Post Technology Plan for Professional Growth & Development **EDUC 2520** Well-Remembered Events Journal
Principle 10: Community	**EDUC 2020** Ethics Activity **EDUC 2520** Student Teaching Brochure

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Application of Technology in Education Courses

In the teacher preparation program at the University of Nebraska at Omaha, students are required to take EDUC 2010 Human Growth and Learning, and EDUC 2020 Educational Foundations as the first two courses in their professional education sequence. Both classes have various reflective thinking activities that are submitted to students' digital portfolios. By using the digital portfolio, students have the opportunity to integrate technology into their reflective learning experience, which hopefully will be carried later in their role as teacher. The learning activities that are submitted in the digital portfolio will help students understand how technology can be an effective tool in teaching and learning.

Two other examples of the integration of technology in the professional sequence of courses are found in EDUC 2520-004 Instructional Systems. This course provides students with the basic aspects of curriculum design and implementation, in which students must complete a project entitled Effective Instruction through Schema Representations. In this same course, students also use BlackBoard to produce their field reports which are entitled Well-Remembered events, that are based on the students' observational experiences. These four technology-integrated courses provide students with rich technological experiences, which are supported by the INTASC Principles. Each of these four examples of technology integration in the EDUC courses is described below in detail.

Digital Portfolio

The digital portfolio has many advantages in a teaching and learning situation. The teacher can provide an individualistic approach in the learning activity which is quick in submission and response, and this medium gives evidence of learning through the pre-service teacher candidate's years in school.[1] The digital portfolio provides teachers and students the advantage of immediate interaction, without the limitation of a specific time or a specific classroom. Therefore, the digital portfolio provides the teacher and student with real evidence of learning through a process and product learning experience.

In EDUC 2020 Educational Foundations, students can experience reflective thinking through an assigned ethics activity in the digital portfolio. Students submit a basic definition of ethics which reveals their philosophy and disposition as pre-service teacher candidates.[2] Next students visit a list of Websites on the topic of ethics, which allows the student to further expand their views of ethics. At that point, students can revise their basic definition of ethics, which is then submitted as a revised ethical statement. Then, students are expected to find an ethical clash in the print media, which allows them to apply the revised statement of ethics, and submit their response to their ethical clash on the digital portfolio. After completion all of the steps to this ethics activity, the faculty member can choose either to have students resubmit their paper for further work or to grade the submitted paper as is on the digital portfolio.

Teacher candidates who are actively involved in this constructivist activity discover the connection between teaching and learning, and, therefore, the role of the teacher and the learner is better understood.[3] They see themselves as the learners of concepts, which are built on previous learning, making the learning experience more effective. They also see the teacher as the facilitator or scaffolder who supports the student as they progress through various learning activities.

By placing the ethics activity in the digital portfolio, the students' work can be archived and used as a reflective measure of the student's ethical beliefs to be used in future classes, or a means of marketing of their learned competencies for future employers. This is one example of the commitment of department faculty to use forms of formative, summative, and marketing digital portfolio activities in their classes for a program-wide integration of technology into the professional education sequence courses that is in line with the INTASC Standards.

Alternative Observation Technology System

At the University of Nebraska at Omaha, federal funding was secured for a two-way audio/video conferencing system. A two-way conferencing connection is possible through a computer's Internet protocol number that allows remote viewing of any classroom with Ethernet connections to the Internet. A port in the firewall, which blocks incoming and outgoing electronic traffic, must be opened at each site to allow for the two-way connection. A T-1 line of a high bandwidth is preferred to handle the high traffic these audio/video connections generate. Keep in mind that it is the amount of Internet traffic an institution has that can make a difference, especially in the video display.

In EDUC 2010 Human Growth and Learning, university students have five observation experiences at the preschool, kindergarten, special education, elementary, and secondary levels, which are guided by field competencies. A two-way audio/video conferencing system is being used for Human Growth and Learning classes as a tool of technology for alternative observations of classrooms in the school community.

This conferencing system allows for two-dimensional viewing of the classroom through a camera that is about eight inches high and four inches wide and is virtually soundless. The microphones are placed strategically around the room to pick up the voices of the teacher and the children. At the university site, the camera is controlled to follow the learning activity, such as following the teacher in large group setting or zooming in on small group activities. Through this experience, university students can gain an understanding of how children learn,[4] in what type of setting, and how children differ physically, intellectually, and socially.[5]

The remote video observation can be taped, which gives the university classes flexibility for viewing during class or at a later time, for example with evening classes. This taping feature is also helpful with children's classroom schedules which do not provide quality observation time, such as when a child is engaged in quiet reading time, or when children are away from the classroom for lunch and other activities.

The remote observation experiences works best with the younger and special needs child, due to the great opportunity for interaction with the classroom and other students, and it is no more intrusive to the school classroom than the traditional on-site visits. With the continued success of this alternative observation method through the conferencing system, colleges and universities can provide quality observational experiences by integrating distance learning technology into teacher preparation program classes.[6]

Schema Representations via Inspiration

All students in the teaching preparation program (elementary, secondary, health and physical education, music and art education, and speech and language pathology) are required to take EDUC 2520 Instructional Systems. This course orients pre-service teacher candidates with the basic aspects of curriculum design and implementation. The course includes such topics as: (a) instructional delivery strategies

https://newprairiepress.org/edconsiderations/vol31/iss2/6
DOI: 10.4148/0146-9282.1256

based on the assessment, prescription, implementation, and evaluation model of the College of Education; and (b) educational technology selection, design, production, utilization and evaluation. This course seeks to help teacher candidates understand the role of the teacher as the orchestrator of the learning environment and the integral part these topics play in that role.

In an effort to integrate the pedagogical knowledge with the technology skills learned through the course, students in EDUC 2520-004 are required to complete a project titled, "Effective Instruction through Schema Representations." Nietfeld defined a schema representation as, "...similar to a concept map in that the goal is to present a graphic representation of a primary concept along with all of the peripheral and interlocking nodes of information associated with the concept."[7] The goal of this project is to encourage students to think about the pedagogical and technological knowledge they learned regarding effective instruction and then represent the data in a creative format using a schema representation.

Throughout the semester students receive information on the following topics: (a) characteristics of effective teachers; (b) student diversity; (c) instructional strategies; (d) unit and lesson planning; (e) questioning strategies; (f) classroom management; and (g) assessing student learning. Toward the end of the semester, students are required to complete a preliminary concept map based upon the instructional delivery strategies of assessment, prescription, implementation, and evaluation. The students are required to develop their schema representations around a visual metaphor, graphic, or theme. Once they have completed this step, the next task is to fill in the visual graphic with the pedagogical knowledge they have acquired in this course and past courses. The schema representations become diagrammatic representations that demonstrate meaningful relationships and connections between instructional delivery strategies and the relationship to effective instruction.

Students attend a tutorial session on how to use the Inspiration software application. Utilizing the data on the concept maps, the students then design schema representations in Inspiration. The tools within Inspiration make it simple for users to prioritize and rearrange ideas to create clear, concise schema representations. The schema representations built in Inspiration go beyond concept mapping by allowing for more creative formats.

Upon completion of the project students place the completed work in their digital portfolio. This project provides an integral link between pedagogical knowledge and demonstration of that knowledge in a creative format. The schema representations assist students in evaluating the process and many facets of effective teaching and practice through development of a mental model. This mental model requires pre-service teachers to synthesize and personalize their understanding of effective teaching around the areas of assessment, prescription, implementation, and evaluation, all of which form the foundation of the course.

"Well-Remembered Events" via BlackBoard

Today's education landscape is characterized by a greater demand for anytime/anywhere learning. As we move into the 21st century, technology has become a significant part of how teacher candidates are trained. The university Information and Technology Service has provided faculty and students with the opportunity to utilize the Web-based server software system titled BlackBoard. BlackBoard serves 5.4 million active users, with more than 1,900 live institutions. Our university is one of eleven educational institutions in Nebraska utilizing BlackBoard.

In the Instructional Systems course students are required to complete twenty observational hours in an assigned school setting. The placements are made in socioeconomically diverse elementary, middle, and high school settings. Throughout the 20 hours, pre-service teacher candidates are required to complete field reports that are titled "Well-Remembered Events." The field reports are guided by questions based on the clinical aspects of assessment, prescription, implementation, and evaluation. In an effort to utilize the Web-based server available, students are required to place their events online through the tool in BlackBoard called Discussion Board.

Discussion Board is utilized as an additional communication tool, moving students beyond routine class discussions. Following observations and participation in the schools, pre-service teacher candidates are required to respond to questions, which are set up in forums. Discussion Board is used in a manner similar to a virtual chatroom. By requiring students to engage in self-reflection and evaluation, it is hoped they will make connections regarding the pedagogical aspects of assessment, prescription, implementation, and evaluation.

Conclusions

The E-Core team, which is made up of the faculty team leaders of each of the professional educational sequence of courses, looked specifically at the five educational core courses required of all College of Education students. Those classes that are required for this sequence are: (1) EDUC 2010 Human Growth and Learning; (2) EDUC 2020 Educational Foundations; (3) EDUC 2030 Human Relations; (4) EDUC 2510 Applied Special Education; and (5) EDUC 2520 Instructional Systems.

The E-Core faculty identified cognitive knowledge, skills, dispositions, and technology competencies that were imbedded in this professional education sequence. These knowledge, skills, and dispositions, which are required of teacher education candidates through NCATE and the INTASC Principles, were then aligned with NCATE and INTASC to ensure that the department was meeting their responsibilities to their students who completed the teacher education preparation program.

The College of Education technology support staff then developed an online digital portfolio, which includes a summary of each of the INTASC Principles and a scoring rubric. This digital portfolio allows faculty members to document and record the individual teacher candidate's progress as they correlate to the INTASC Principles. Each of the professional sequence of courses, or the E-Core classes, is assessed utilizing the rubric based on these principles.

The E-Core faculty has made a commitment to implement the use of a digital portfolio as a means of integrating technology into education. This commitment affirms that all E-Core faculty, including adjunct faculty, are using forms of formative, summative, and marketing digital portfolio activities in their classes for a program-wide integration of technology into the professional education sequence courses. This commitment can be seen in the four examples mentioned above in the application of technology integration in the professional sequence of courses.

Educational leaders discuss how good teaching is evaluated through what one knows and is able to do.[8] At the university, the E-Core faculty is committed to the use of the digital portfolio as the device which will showcase what a pre-service teacher candidate knows

and is able to do. The digital portfolio is able to do this through an electronic medium that is faster, if not an easier, method of delivery. The faculty can use the digital portfolio to help in the setting of goals based on the INTASC standards and the reflection of those goals in products submitted to the digital portfolio throughout the students' teacher preparation.

We have an obligation as teachers to help our pre-service teacher candidates become higher-order, conceptually-based learners and thinkers. It is critical for teacher educators to continue personal modeling of technology as an aid to instruction and as a tool to engage students in higher-order/conceptually-based dialogues. Jackson states in his discussion on transformative teaching: "It is essential to success within that tradition that teachers who are trying to bring about transformation changes personify the very qualities that they seek to engender in their students."[9] It is hoped that as teacher candidates are engaged in purposeful, yet guided, online dialogue they will begin to become higher-order, conceptually-based learners through the experience.

Endnotes

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https://newprairiepress.org/edconsiderations/vol31/iss2/6
DOI: 10.4148/0146-9282.1256