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LEARNING 21ST CENTURY SKILLS BY ENGAGING IN AN INFOGRAPHICS ASSIGNMENT

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Practicing teachers who have strengthened their own 21st century skills will be well positioned to guide their students in enhancing traits such as effective communication and critical thinking. This paper outlines an infographics assignment in a Master's level Education course, designed to enhance students' 21st century skills while applying an instructional design framework and developing technical skills. One student in the course stated that the assignment was a valuable learning experience that challenged her to think about how a message can be conveyed visually, improved her ability to critically analyse visual information and strengthened her visual literacy skills.

Keywords: Infographics; 21st century skills; Instructional design; Critical thinking

21ST CENTURY SKILLS

Twenty-first century skills is a broad term that refers to the knowledge, skills, and traits that are generally acknowledged to be critical for today's learners to possess in order to be successful in work and life (American Association of Colleges of Teacher Education and the Partnership for 21st Century Skills, 2010). Although there is no definitive list of 21st century skills, they are generally considered to include the following: 1) knowledge in core subjects such as language arts, math, and

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science; 2) interdisciplinary understanding, such as global awareness and environmental literacy; 3) attributes such as critical thinking, collaboration, and innovation; 4) information, media and technology skills; and 5) life and career skills, including adaptability, productivity, initiative and leadership (American Association of Colleges of Teacher Education and the Partnership for 21st Century Skills, 2010). The idea that skills and attributes such as effective communication are critical is not a new one; however, there is increasing acceptance that as a society we should be developing our learners to have a broader base than factual knowledge so that they can be successful in their careers and other aspects of life (Rotherham & Willingham, 2010).

Teachers can benefit from having some background in and opportunities to practice the sort of learning experiences that promote 21st century skills in order to implement such activities in their own classrooms. Not only should they have some technical skills in using digital tools, but they also need to develop attributes such as critical and innovative thinking, problem solving, and digital citizenship, in order to model 21st century skills for their learners (Smith & Dobson, 2011).

METHODS

This paper describes an assignment used in a higher education course for Master's level Education students, in which they created an infographic as a means to enhance their visual literacy, digital media, and instructional design skills. The insights and arguments presented in the paper represent those of the instructor and one of the students in the course.

INFOGRAPHICS ASSIGNMENT

The assignment was one of three assignments that students completed in an online Master's level course. All students in the course had a Bachelor's degree, and almost all of them were teachers in

K-12, higher education, or a continuing education context. Each student created his or her own infographic to use within their own professional practice.

An infographic is an arrangement of text and images such as drawings and charts, combined with the use of color and white space to convey information visually. This visual representation of concepts and data can potentially help the viewer to grasp information more readily (Janalta Interactive Inc, 2014). Although infographics are not new, in recent years they are being used more frequently in educational contexts to convey messages, relate numerical data, illustrate important concepts, and promote visual literacy skills in learners (Krauss, 2012).

There were three major learning outcomes associated with the assignment. First and most importantly, the instructor wanted students to think critically about different ways of conveying information, including graphs and charts, narratives and descriptions, icons and images; a related goal was to prompt students to think about how those elements are arranged, such as use of color and white space, text boxes, arrows, font sizes and placement of text, in ways that highlight certain points. The second learning outcome was for students to use an instructional design framework to guide the process, thereby putting theory into practice. A third learning outcome was for students to learn some digital media skills that they could use in their own work context to create educational materials for their own learners in future. Throughout the process, students would enhance several 21st century skills, including critical thinking and problem solving, communication, collaboration, creativity and innovation, information literacy, media literacy, initiative and self-direction (American Association of Colleges of Teacher Education and the Partnership for 21st Century Skills, 2010).

Students submitted three items as part of the assignment. First, a proposal was submitted to the instructor for feedback only, not grades. In the proposal students outlined their topic and concept for the infographic. They also identified the type of infographic they wanted to create:

- Comparison: Compares two or more things.
- Flow chart: Branches allow the user to decide which path to follow.
- Timeline: Displays chronological information.
- Process: Sequential, with steps or stages.
- Image-based: Use a photo or graphic to help convey information.
- Data: Visualized using statistics, charts, graphs, numbers, etc.
- Narrative: Includes diverse content that is not all visual; may tell a story.
- Metaphor: Uses a metaphor to illustrate concepts (Adams, 2014)
- Combination: Uses two or more types of infographics
- Other: A type of infographic that is not listed above

The final submission consisted of two items, the infographic and accompanying documentation. Students used the software Piktochart™ to create their projects, which allowed them to save their infographics as Word™ or PDF files. Documentation included a description of the intended learners for the infographic, learning outcomes, content and design decisions, and a reflection on the project. The timeline for the project was about a month, which allowed students to incorporate feedback from their proposals into their projects.

A grading rubric was given to students at the start of the assignment so they could see how their work would be assessed as they made progress on their projects. Two-thirds of the grade was allotted to the infographic, and one-third to the documentation. The infographic was assessed on factors such as success in conveying a clear focus and visual concept, use of text and graphics, and attention to detail. The documentation was assessed on the quality of the stated learning outcome for the infographic, articulation of audience, content, and design decisions, as well as a reflective statement on pedagogical issues regarding the creation and use of infographics. The intent was to have students think beyond cosmetic features of their assignment, to consider how their project enhanced learning of their intended audience. Therefore, part of the assessment was designed to encourage students to use 21st century skills.

STUDENT LEARNING

Students created some amazing infographics that they were able to implement in their professional practice, a positive benefit of the assignment (please see some examples of student projects at <http://ederprojects.weebly.com/infographics.html>). More importantly, though, was what they learned from the assignment. One student reflected on how teaching and learning with digital content could take multiple skills and good understanding of the pedagogical aspect of the instructional and graphic design. It is a complex process that involves careful planning and artistic execution. The infographic assignment gave students a unique experience in enhancing their 21st century skills from the perspectives of both being a student in the MEd program and being an educator who designed and produced an infographic for practical professional purpose. Through this infographic assignment, the student realized that, like any instructional design project, it is critical to have a thorough understanding of the learner profile and clear focus on the learning

outcomes. The development of 21st century skills such as critical thinking, problem solving, creativity, and media literacy was encouraged and enhanced throughout the project (American Association of Colleges of Teacher Education and the Partnership for 21st Century Skills, 2010). The student also reaffirmed that, as an educator, it is a good investment to spend time at the beginning of a project to understand the purpose and learners in order to effectively translate course content into digital formats.

With the infographic assignment, students had the opportunities to receive feedback from the instructor in various stages. Students started with a one-page proposal that outlined the target audience, topic, intended learning outcomes, type of infographic, and relevance to learners. This exercise was crucial in helping students define the project scope in an early stage. The expectations were clearly communicated by the instructor. Students were offered valuable resources and support and resources throughout the self-directed learning process.

One student who had no formal training in graphic design found that creating infographics for digital learning content was in itself not difficult. With readily available templates in Piktochart™, as well as flexibility to use more sophisticated features, students could quickly generate and publish infographics. However, creating a great infographic which conveys the information and messages clearly, concisely, and artistically, was more challenging. Students were asked to make many design decisions requiring close attention to very fine details. It takes a thoughtful mind with critical eyes to create an infographic that is right for the audience, with the right amount of information, and delivered in the right way. This student felt the infographics project helped her to gain valuable experiences and skills, opening a door to step into a world of possibilities of enhancing teaching and learning with interesting digital objects.

INFOGRAPHICS AND 21ST CENTURY SKILLS

Like the students in Matrix and Hodson's (2014) study of higher education students, the assignment promoted critical thinking skills, enhanced visual literacy, and required the learner to demonstrate innovation and self-direction. Young (2012) found that exercises in media literacy also enhanced junior high and high school students' traditional literacies, including writing for different audiences and writing clearly. Similar to the research, the student in this course felt that the assignment was successful in enhancing her 21st century skills. More research is needed to determine if the student's experience was typical of other students' learning in the course.

NEXT STEPS

As with most assignments, there is room for improvement in terms of enhancing the learning experience for students. In future it would be beneficial to add a peer review component to the assignment. Peer review offers a number of benefits, including gaining formative feedback before an assignment is graded, strengthening one's own work, and enhancing analytical skills (Cho & Cho, 2011; Li, Liu, & Steckelberg, 2010; Nicol, Thomson & Breslin, 2014). The timeline for the project would need to be lengthened by a week or two to allow for the peer review cycle but may be warranted considering the potential benefits to student learning. Additionally, it would be helpful to continue to build resources for the assignment. Future cohorts will be able to refer to examples of past students' work, to generate their own ideas and inspire them.

CONCLUSION

Through an infographics assignment, a Master's level student strengthened her 21st century skills such as critical thinking, visual literacy, and creativity. Rather than focusing on the cosmetics of

her project, she was encouraged to think about how information can be conveyed in a visual manner. Not only did she gain instructional design strategies and technical skills, she developed her own strategies for promoting 21st century skills. More research is needed in this area to determine the scope and impact of such assignments on student learning and engagement.

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