Experiential Learning Enhanced in Agricultural Classrooms Using 360-Degree Video Technology

Morgan Boland[1]
[1]Department of Education, Fort Hays State University
Research Mentors: Dr. Linda Feldstein, Dr. Matthew Clay

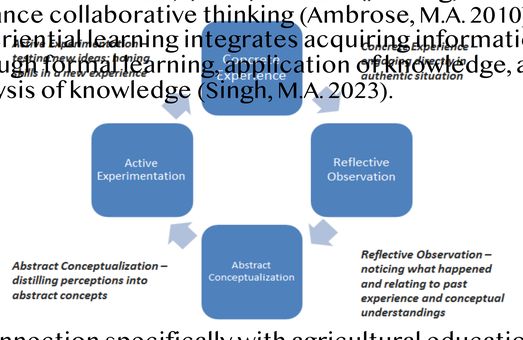
FORT HAYS STATE UNIVERSITY
Forward thinking. World ready.

Abstract

Experiential or "hands-on" learning allows students to self-correct educational missteps and have live examples of core concepts registered in the brain as holistic experiences, which enhances their educational experience overall (Roland, M.A 2017). However, due to financial constraints and logistical barriers, it becomes more difficult for educators to give their students these field-based experiences. Using 360-degree video technology, educators can address these limitations and provide students with field experience anywhere (Clay, M. A. 2023). This poster will discuss how 360-degree video will impact experiential learning in the agricultural classroom.

Introduction

360-degree video technology creates visuals in which the view in every direction is captured and presented simultaneously (Cameron, M.A. 2020). 360-degree videos can be watched from several devices, allowing students to look at an image from different angles and perspectives. With the introduction of this new technology, the question becomes whether there is a place for it in the world of education. While the research into this technology has only recently been developed, peer-reviewed articles indicate an opportunity to use this in an educational setting. Studies indicate students have been better able to understand the content in comparison to watching standard videos and that this is a viable alternative to not physically taking students on field trips. The question that begs to be answered is whether experiential learning can be enhanced by utilizing this type of technology in the classroom. Experiential learning is said to improve content retention, better develop problem-solving skills, increase motivation, enforce critical thinking, and enhance collaborative thinking (Ambrose, M.A. 2010). Experiential learning integrates acquiring information through formal learning, application of knowledge, and analysis of knowledge (Singh, M.A. 2023).



In connection specifically with agricultural education, 360-degree video technology can give a real-time experience of what these different agricultural industry locations, such as feed yards or grain bins, look like and allows the educator to talk about real places versus hypotheticals. 360-degree video technology can best be integrated into secondary education through discussion and project collaboration.

Key Terms:

360-Degree Video: Video recordings where a view in every direction is recorded simultaneously, shot using an omnidirectional camera or a collection of cameras.

Experiential Learning: Engaged learning process whereby students "learn by doing" and reflect on the experience. This process includes the integration of knowledge, activity, and reflection.

Methodology

Research Design: Quantitative, Qualitative, Comparative
Limitations:

- Students may not understand the directions/worksheet
- Their peers may influence students depending on grouping, skewing result accuracy.

Proposed Research Question: How can 360-degree video support experiential learning in the agricultural classroom?

The students in the agriculture class will be separated into two groups, each being assigned the same lesson plan and pre-assessment questions. However, one group will follow the lesson using the standard video while the other will use 360-degree video. The students will be randomly placed into one group or the other using a name-selecting computer application. The lesson itself will cover topics around animal welfare. It will entail students watching a video about the importance of this topic or looking at different barn/pen set-ups to identify animal welfare subjects. Each group will complete the same worksheet, discuss what they interacted with, and then complete a post-assessment towards the end of the week. The post-assessment for both groups will have the same questions and will be compared to the pre-assessment once completed. Each group will take the post-assessment in separate rooms simultaneously and be monitored to ensure that nobody is cheating. Students who were absent during the start of this study will be excluded from the data collection but will still complete the lesson using one of the methods.

The method being used in this research is like research that other[illegible] conducted. A study done by Manuel Garcia, for example, took two[illegible]ooms and had one group watch the 360-degree video and the other wat[illegible] (Garcia, M.A., 2019) The research done in this study was extremely[illegible] easily manipulated to better fit the needs of both those requestin[illegible]one and the test subjects.

360-Degree Video Example of Fort Hays State University Farm (Beef Unit)

Data Collection

The collected data will be qualitative and quantitative, as we look at two separate interactions with the material in the lesson. The qualitative data will show how interactive students are in the lesson once they have watched the designated content and completed the worksheet. This data would be considered qualitative as it will be based on the supporting teacher's observations and notes made during the discussion portion of this lesson. The observations and notes will be evaluated to compare whether students engaged more with one another and the content after watching the standard or 360-degree video.

The quantitative part of the study will compare the scores from the post-assessment in each group to the pre-assessment to evaluate whether students retained more watching the standard video versus the 360-degree video. Similar questions will be asked on each assessment to ensure consistency regarding the questi[illegible]e-assessment is multiple choice, so will the post-assessm[illegible]me post-assessment, not two separate ones.

Conducting filming at the Fort Hays State University Farm where many animal science classes are visited.

Discussion

Based on research conducted using a similar methodology, the anticipated conclusion of this study will be that students who interact with 360-degree video technology will be more involved in their learning and have better recall scores when compared to students who watch a standard video. If this result occurs, this information can be used to promote the consideration of implementing this technology within the agricultural classroom nationwide to b[illegible] learning.

Example of the 360-video tri-pod used to film many of the videos.

Conclusion

Pending results and data collection. Prior research has indicated educators who utilize 360-degree video technology in their classrooms have reported this is an effective tool and students better interact with the material as they feel fully immersed. However, it is highly recommended several considerations be taken, including funding, ease of use, and alignment with course and program objectives.

Future research should compare 360-degree video technology to other technological tools utilized in classrooms besides standard video to see if the same conclusion can be reached. Future research should also examine how to integrate this technology into a lesson best so students can get the most out of such resources.

References

Chen, A., Liu, S., Cameron, J., Gould, G., & Ma, A. (n.d.). *360 essentials:* A beginner's Guide to Immersive Video storytelling. 360 Essentials A Beginners Guide to Immersive Video Storytelling. https://pressbooks.library.torontomu.ca/360essentials/ Experiential learning. Experiential Learning | Center for Teaching & Learning. (n.d.). https://www.bu.edu/ctl/guides/experiential-learning/

Garcia, Manuel B., et al. We're going on a virtual trip!: A switching-replications experiment of 360-degree videos as a physical field trip alternative in primary education. I*nternational Journal of Child Care and Education Policy*, 17 (1). https://doi.org/10.1186/s40723-023 -00110-x.

Roche, L., Kittel, A., Cunningham, I., and Rolland, C. (2021) 360° video integration in teacher education: A SWOT analysis. *Frontiers Education*. (6:761176). doi: 10.3389/feduc.2021.76117

Schütz, Aurelia, et al. Virtual farm tours—virtual reality glasses and tablets are suitable tools to provide insights into pig husbandry. *PLOS ONE*, 17 (1), e0261248. https://doi.org/10.1371/journal.pone.0261248.

Singh, S. (2023, January 4). *10 benefits of experiential learning.* GoBookMart. https://gobookmart.com/10-benefits-of-experiential-learning

Clay, Matthew. Integrating satellite imagery and 360- degree photo sphere to teach environmental science online for elementary students.