Introducing gaming into the school-based agricultural education classroom: An innovative starting block for teacher-educators

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Introduction/Need for Innovation or Idea

Teaching techniques used in School-Based Agricultural Education (SBAE) settings are often unique to student needs, instructor preferences, location of program, and community involvement. While experiential learning (EL) is commonly seen in SBAE instruction, not all sub-sets or adjoining techniques are used. One such technique is game-based learning (GBL). The use of games in SBAE instruction as a means of reflection (i.e., Kahoot and Trashketball) is not uncommon; however, the purposeful engagement of games or gaming elements to provide students with knowledge or learning opportunities is not widely seen.

The *Handbook on Agricultural Education in Public Schools* by Phipps et al. (2008), commonly used in the education of pre-service SBAE instructors, lists various teaching techniques, in which EL and GBL are both included. EL has been widely discussed and refined by Dewey (1938) and Kolb (1984) and is the act of learning through four distinct components. GBL, while discussed by Phipps et al. (2008), is only mentioned as a counterpart to another technique. Plass et al. (2015) acknowledges the confusion and uncertainty surrounding GBL but identifies the need and benefits of its utilization in the classroom. GBL has been defined as a teaching technique that uses contests or experiences in which students compete toward specified learning outcomes while following outlined rules. This definition is often strengthened with the addition of the reflective component of the EL cycle. With such a strong tie to EL, the use of GBL should be something that SBAE pre-service instructors are, at a minimum, introduced to during their methods of teaching courses.

How it works/Methodology/Program Phases/Steps

With such a widely agreed upon use of EL, the lack of GBL is concerning, especially with the elevated use of Project- and Problem-Based Learning. With this in mind, a collaboration between Auburn University and Mississippi State University was established to develop *I Thought This Was Just Farming Simulator: An Introduction to Game Based Learning in Agricultural Education*, a workshop focused on the practical application of GBL in SBAE. The two-hour workshop introduced different elements of GBL to increase the awareness of GBL for SBAE instructor-educators and promote the inclusion of GBL in pre-service methods of teaching courses. The inaugural workshop hosted over 20 post-secondary instructors, educators, and students. A pre- and post-assessment was conducted to introduce gaming aspects, determine use of GBL, establish perceptions of GBL, and collect demographic information of our participants. Fifteen participants completed the pre- and post-assessment associated with the training, three only completed the pre-assessment and, two only completed the post-assessment.

The workshop was divided into four key sections (introduction, low-stakes GBL, high-stakes GBL, reflection). Each section had a defined objective that related to the overall goal of increasing awareness and understanding of proper and practical applications of GBL. The introduction section provided an overview of GBL and helped define specific aspects of the use of games for instruction rather than reflection. The second section, adapted from an established curriculum, introduced low-stakes games for learning. The games chosen for the workshop focused on different FFA events to help illustrate that games can be used to familiarize students with complex topics. The third section, developed originally for this workshop, provided the

participants with an opportunity to engage in a Role-Playing Game (RPG) focused on environment and natural resources course content. This RPG was created using artificial intelligence to provide the structure of the activity as a means to show that game design and development is accessible for a wide range of people. The final section tied all the content covered together to further establish the connection between GBL and EL through the use of reflection as defined by Dewey (1938) and Kolb (1984).

Results to Date/Implications

Using the data collected from the assessments, benchmarks were established that indicated positive growth in awareness, competency, and potential future use of GBL as a teaching technique. Participants who skewed more positively toward having previously engaged in GBL as a teaching technique initially indicated higher frequency of use as a technique, averaging at a *very often* use of GBL compared to *occasionally*, *once or twice*, and *never* response. This gap was shifted across all responses for the pre- and post-assessment, with each participant category of previous use indicating an occasional to very often average for future use.

Across the six awareness and perception Likert-type questions, five showed positive increases in change from the pre- to post- assessments. The greatest allowable increase was the participants identified introductory understanding of GBL ($\Delta = 0.91$, $\Delta\% = 60.78$) followed by the level of appropriateness of GBL use in SBAE as stated by the participants ($\Delta = 0.46$, $\Delta\% = 47.06$). Confidence to implement GBL had an average increase of 0.86 ($SD = 1.15$) for each of the participants as a result of the workshop.

Future Plans/Advice to Others & Costs/Resources Needed

Looking at the different techniques that SBAE utilize in their classrooms, it is important for teacher preparation programs as best preparing their pre-service students with the tools to succeed in the classroom. While games have often been used as a reflection technique often associated with formative evaluation, there are untapped opportunities for SBAE instructors to engage their students with timely content. The workshop provided the space for teacher-educators to explore the uniqueness of applied gaming in the classroom.

Continued instruction through organized workshops on practical applications of gaming and gamification of SBAE materials should be the first of numerous steps taken to provide the opportunity for instructors and teacher-educators to explore and engage in GBL. Further exploration of gaming mechanics and curriculum development with gaming as the primary technique would be necessary in the growth of this workshop. Costs for implementing future workshops would be directly associated with the fees related to hosting an event (location and printed materials), game specific supplies needed (station elements and resources), and facilitator preparation and travel (time and effort).

For the workshop, resources included printed materials for the workshop, RPG elements, rotation station resources, travel, and facilitator training. Time was the most significant resource used, as the rotations and RPG were either adapted from prior activities or developed from scratch. Future development of these elements would be significantly reduced due to lack of need for original development of some gaming aspect. For those who are interested in exploring GBL and the instruction of it, focusing on the collaborative nature of games would provide the best results. Reflecting on many experiences of “Monopoly,” cooperation vs. competition often leads to more positive and memorable experiences.

References

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