Perceptions of the Usability of a Virtual Field Trip within a Feed Mill Facility

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Introduction/Need for Research

Field trips play a role in helping bridge formal and informal learning and prepare students for lifelong learning. Field trips are one way of adding variety to instruction, thus optimizing teaching effectiveness while motivating student learning (Hofstein & Rosenfeld, 1996). Depending on the destination, field trips can serve as informal science education events to help students become exposed to STEM subjects (Knapp, 2000).

Despite research confirming enhanced learning, relatively few teachers take students on field trips no matter the age group. Tuthill & Klemm (2002) reported the decline in field trips, confirming that few students have such experiences today. To add to the existing limitations, additional challenges were seen during the COVID-19 pandemic. There were often limitations on both local and international travel, especially to destinations considered high-risk (Zhou et al., 2021). Financial constraints were another factor, as schools and districts faced economic challenges due to the pandemic's impact (Huang & Liu, 2022).

The situation forced teachers to adapt their lesson plans and find alternatives to traditional field trips. One such alternative was the use of VFTs (virtual field trips). A VFTs is a guided exploration through the internet into places and experiences that are pre-screened and thematically based to provide a structured learning experience (Sharma, 2023). Additionally, VFTs offer a cost-effective alternative, eliminating expenses related to transportation, admission fees, and other logistical considerations (Sharma, 2023). The VFTs may include visiting a website and taking a virtual tour, reviewing media posted online, or exploring project websites that incorporate multimedia and provide supporting curriculum (Tuthill & Klemm, 2002).

Theoretical Framework

The Technology Acceptance Model (TAM) posits that users' acceptance of a computer application depends primarily on two critical factors: (1) their perception of its usefulness and (2) their perception of its ease of use (Davis, 1989). The TAM focuses on understanding users' behaviors and attitudes towards adopting technology. This study employs the TAM framework to explore students' perspectives of a specific VFT.

Methodology

This study aimed to assess students' perceptions of the usefulness and ease of use of a particular VFT (Kansas State University O.H. Kruse Feed Technology Innovation Center). The VFT was introduced by a faculty member at a Pacific Northwest university to 36 students during class time in the Summer of 2023. Participants were asked to complete the tour and explore the VFT as they wished. After the tour and exploration portion of the study, students were asked to complete an instrument. The instrument was administered anonymously using the Qualtrics online survey platform. The survey consisted of four introduction questions, nine technology acceptance questions, three intentions to adopt questions, five sense of place questions, five career interest questions, and three open-ended questions. The survey utilized Likert-type questions to gauge respondents' attitudes, perceptions, and levels of agreement regarding various aspects of the subject matter. Each question had a scale attached that displayed the following options for the participants to select from, *1= Strongly disagree, 2= Somewhat disagree, 3=*

Neither agree nor disagree, 4= Somewhat agree, and 5= Strongly agree. Four demographic questions were asked at the end of the instrument.

Results

Of the 36 students who were offered the opportunity to participate, 33 students completed the data collection process. The participants ranged in age between 19 and 35 (M = 22.25, SD = 3.83). The participants included a variety of academic levels: Sophomore (n = 3), Junior (n = 11), Senior (n=17), and Other (n=2). The participants reported their gender as male (n = 3), female (n = 24), and prefer not to say (n = 1). Due to space not all results are included in this abstract. Focus is on the TAM (Davis, 1989) relevant questions.

Students were asked to evaluate the usefulness of the VFT. Out of 33 participants, 91.5% (n= 32) believed that the virtual tour significantly enhanced their knowledge about the subject matter. When assessing the utility of virtual tours in the context of agriculture, food science, and natural resources, 85.7% (n= 30) found them to be a valuable means of experiencing such sites. Regarding convenience, 89.6% (n= 31) of respondents either somewhat agreed or strongly agreed that virtual tours offered a convenient method to explore sites. Students were also asked to evaluate their perceived enjoyment for the VFT. A vast majority (83.90%, n= 29) expressed either a somewhat or strong agreement that they enjoyed the virtual tour.

Regarding participants' perceptions concerning the ease of use associated with the VFT a notable 86.70% (n = 30) found it straightforward to understand how to engage with the virtual tour. Similarly, the flexibility of the virtual tour interface resonated positively among participants (80%, n = 28). In terms of skill acquisition and proficiency while using the virtual tour, 80% (n = 29) of respondents either somewhat or strongly agreed that they could easily become adept at navigating the experience.

Conclusions

Participants reported an overall favorable perception regarding the user-friendliness and adaptability of the virtual tour, highlighting its effectiveness in facilitating a seamless and intuitive user experience. Central to the evaluation of VFTs is the Technology Acceptance Model (TAM) (Davis,1989). This model underscores the critical role of perceived usefulness and perceived ease of use in determining users' acceptance and adoption of technological applications. This study underscores the potential of VFTs in augmenting learning opportunities, especially within specialized fields like agriculture. By leveraging technological advancements and pedagogical insights, VFTs offer a viable alternative to traditional field trips. As educational paradigms continue to evolve in response to global challenges and technological innovations, VFTs are poised to play an increasingly integral role in fostering immersive, equitable, and impactful learning experiences for students across diverse settings and disciplines.

Recommendations

Additional research on the completed Feed Mill VFT as well as the other VFTs in the project is recommended from both the student and instructor perspective. The current VFT was built for use in post-secondary classrooms, but its application in secondary and elementary classrooms should be explored. Training of instructors and the creation of additional support materials are also recommended.

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