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Oluwarotimi Randle; K Oyetade

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Examining the factors influencing undergraduate students' use of digital arts playrooms in South African university game studies programs

Oluwarotimi Randle and Kayode Oyetade

[1]*School of Arts, University of the Witwatersrand, Johannesburg, Gauteng, Republic of South Africa*
[2]*Department of Information and Communication Technology Vaal University of Technology, Vanderbijlpark, Gauteng, Republic of South Africa*

Corresponding author, email: *rotimirandle@gmail.com*

Abstract

Integrating digital arts playrooms into education provides an innovative opportunity to enrich creative learning for 21st-century students, notably within game studies. While digital tools and interactive spaces are gaining attention globally, there is limited research that specifically explores the dynamics of these innovative resources. This study seeks to examine the factors influencing students' utilization of digital arts playrooms as an innovative educational resource. To guide this exploration, the study employs the Unified Theory of Acceptance and Use of Technology as the theoretical framework, which helps identify key determinants of technology adoption. The study adopts a survey-based quantitative research design, utilizing data collected from 279 South African university students who have prior experience or exposure to the digital arts playroom. The research design involved demographic analysis, exploratory factor analysis, and regression analysis to identify significant predictors of usage. The findings reveal that effort expectancy, social influence, and facilitating conditions are significant predictors of digital arts playroom utilization, emphasizing the importance of these factors in shaping student engagement with digital art platforms. However, it was found that performance expectancy does not influence usage, possibly due to the novelty of the technology. This research contributes to educational practices by providing practical insights for enhancing creative learning experiences in game studies programs. By aligning theoretical perspectives with practical applications, the study advances the integration of digital tools in education, offering guidelines for educators and policymakers to effectively foster engagement with digital technologies.

Keywords: 21st-century Learning, Digital Arts Playroom, Educational Technology, Game Studies Program, Student Engagement, Technology Novelty

Introduction

The integration of technology into education has transformed teaching and learning, aligning with global trends that emphasize the role of digital education in preparing students for the complexities of the modern world (Haleem et al., 2022; Timotheou et al., 2023). Central to this shift is the focus on individualized, student-centred learning experiences enabled by digital tools, which foster flexibility and engagement (Alamri et al., 2021). One such innovation is the Digital Arts Playroom (DAP), an innovative platform that offers hands-on learning experiences beyond traditional teaching methods. DAP serves as a dynamic educational tool that integrates creative disciplines with digital innovation, promoting creativity, collaboration, and critical thinking through activities such as game design, multimedia projects, and digital arts creation (Bećirović, 2023; Sharma, 2022).

DAP is a dynamic educational tool and software-based solution that integrates creative disciplines with digital innovation. It promotes creativity, collaboration, and critical thinking by engaging students in activities such as game design, multimedia projects, and digital arts creation. Through experiential and project-based learning, DAP enhances essential 21st-century competencies, including digital literacy, teamwork, and problem-solving skills (Dubey & Sinha, 2023; Ishak et al., 2023). Practical

applications include collaborative group projects, gamified learning, and the use of augmented and virtual reality to create immersive educational experiences (Özdemir, 2022; Yang et al., 2024). While DAP has shown significant potential in game studies, its value extends to a range of disciplines, including arts and ICT, which align with the skills and competencies it fosters.

Despite its potential, the effective use of DAPs in specific educational contexts remains underexplored. Existing research highlights their capacity to enrich learning environments but often lacks a focus on how factors such as discipline-specific needs, institutional support, and student perceptions influence adoption (Di Natale et al., 2024; Smiderle et al., 2020). Nevertheless, a deeper understanding of the factors influencing DAP adoption is necessary to fully realize their potential in enhancing learning outcomes. This study focuses on optimizing the integration of DAPs within academic contexts, specifically in arts, ICT, and education programs, to enhance creative learning outcomes. By investigating the factors influencing DAP adoption and their relationship with the constructs of the Unified Theory of Acceptance and Use of Technology (UTAUT), the research aims to address gaps in understanding technology acceptance in educational settings. The study seeks to achieve the following objectives:

- To identify the key factors influencing the adoption and utilization of DAPs in university settings.
- To explore the relationship between DAP utilization and constructs from UTAUT, with an emphasis on discipline-specific adoption drivers.
- To provide practical recommendations for educators and policymakers to foster engagement with DAPs across diverse educational contexts.

The findings of this study will offer practical insights for educators, policymakers, and technology developers, contributing to global discussions on digital education by providing evidence-based recommendations for enhancing student engagement, digital literacy, and critical thinking. By examining the factors influencing students' engagement with DAPs across various academic disciplines, the research aims to provide valuable insights into the role of technology in improving creative and educational outcomes.

The subsequent sections will review the relevant literature on digital arts in education, outline the theoretical framework underpinning the study, present the research hypotheses, and describe the methodology used to gather data. Thereafter, the results will be analysed, followed by a detailed discussion of the findings and recommendations for future practice. Lastly, the study will address its limitations and suggest directions for further research in the field of digital education.

Literature review

Digital arts, encompassing creative forms such as digital painting, animation, multimedia production, and virtual reality, have garnered recognition in educational settings for their capacity to engage students interactively (De Villiers & Sauls, 2017; Kalamatianou & Hatzigianni, 2018). The integration of digital tools into arts education not only fosters creative expression but also cultivates critical 21st-century skills such as digital literacy, critical thinking, and collaboration (Corbisiero-Drakos et al., 2021). Research highlights that digital arts create dynamic environments for hands-on learning, enabling students to experiment and explore in ways that traditional methods cannot (Bećirović, 2023; Chen et al., 2020; Sweeny, 2023).

One emerging model that exemplifies this integration is the concept of DAP, which promotes the use of digital technologies for fostering creativity and supporting learning. DAPs provide students with access to tools such as graphic design software, interactive simulations, and multimedia production platforms, facilitating a space for innovative exploration and collaboration (Alborzi et al., 2000; Makri et al., 2021).

DAPs are innovative, adaptable learning spaces designed to merge creativity and technology, offering students practical experiences in game studies and digital arts. These environments leverage tools such as augmented reality, virtual reality, digital art programs, and

multimedia software to create immersive and interactive learning experiences (Gui et al., 2023; Ishak et al., 2023). DAPs empower students to explore diverse methods of digital expression, enhancing creativity and skill development across disciplines. The primary objective of DAPs is to create dynamic spaces where students can collaborate, experiment, and develop critical skills in a technology-driven educational setting. These spaces bridge the gap between traditional and modern teaching methodologies, addressing the needs of contemporary learners (Ioannou, 2021; Yıldırım, 2022).

DAPs provide opportunities for students to engage in creative tasks such as producing digital art, animations, and multimedia projects. These activities enable students to express their ideas innovatively while developing technical skills (Bećirović, 2023). Furthermore, the interdisciplinary nature of DAPs allows for the integration of subjects such as history, science, and art, enriching students' understanding through creative expression (Sweeny, 2023). Khaleel et al., (2020) has indicated that DAPs promote creativity, and significantly boost student engagement and motivation. Interactive features, immersive experiences, and multimedia elements capture students' attention, fostering a more engaging learning environment (Bećirović, 2023; Hisey et al., 2022). Moreover, incorporating gamification elements, such as points, badges, and virtual rewards, further motivates students to participate actively and complete tasks (Khaleel et al., 2020; Smiderle et al., 2020).

DAPs facilitate collaborative learning by enabling students to collaborate on digital projects. This fosters teamwork, communication, and the exchange of ideas, which are critical for achieving success in both academic and professional settings (Makri et al., 2021). Aligning DAP activities with educational content ensures their relevance and coherence with academic goals. Integrating digital tools into the curriculum not only increases engagement but also boosts the achievement of learning outcomes (Shonfeld et al., 2021).

Despite their numerous benefits, the implementation of DAPs in educational settings presents significant challenges. Limited access to technology and inadequate infrastructure hinder both educators and students from fully utilizing these spaces. Compatibility issues and resource allocation constraints further complicate adoption efforts (Fancourt & Mak, 2020; Tusiime et al., 2022). Educator preparedness is another critical issue. Teachers require ongoing training to effectively integrate DAPs into their pedagogy and to ensure that activities align with curriculum objectives. Additionally, maintaining inclusivity in DAPs poses a challenge, as not all students have equal access to digital tools and resources. It is crucial to address these disparities to prevent exacerbating the digital divide (Sweeny, 2023; Zubala et al., 2021).

Educators and institutions must remain adaptable to keep pace with emerging technologies, while also prioritizing the privacy and security of students as DAPs have the potential to transform education, preparing students for success in the digital age with proper support.

Theoretical framework

This study employs a theoretical framework to explore the factors influencing the adoption and utilization of DAP in educational contexts. The framework is derived from established theories in educational technology adoption and serves as intellectual scaffolding for hypothesis generation and interpretation. It establishes a foundation for understanding the complexities associated with integrating DAPs into learning environments.

Technology Acceptance Model

The Technology Acceptance Model is a foundational theory for examining users' acceptance of new technologies. It highlights two key determinants: perceived ease of use and perceived usefulness, both of which influence users' behavioural intentions and the actual adoption of a system. In the context of DAPs, perceived ease of use evaluates the intuitiveness of the platform interface and the accessibility of tools, while perceived usefulness assesses the contribution of DAPs to fostering creative exploration and learning. Additionally, behavioural intention reflects users' willingness to engage with DAPs, and system usage is observed

through the frequency and depth of integration in educational settings (Davis et al., 2024; Wu & Du, 2012). The simplicity and adaptability of the Technology Acceptance Model make it a reliable model for studying technology adoption in education. By applying the Technology Acceptance Model, this study aims to identify the factors driving the acceptance of DAPs, thereby offering insights for enhancing creative engagement and improving educational outcomes.

Unified Theory of Acceptance and Use of Technology

UTAUT builds upon the Technology Acceptance Model and incorporates elements from models such as the Theory of Planned Behaviour and Innovation Diffusion Theory. UTAUT identifies four primary constructs influencing technology adoption: (i) performance expectancy, which refers to the perceived benefits and effectiveness of DAPs in enhancing learning and creativity; (ii) effort expectancy, which highlights the platform's ease of use and user-friendliness; (iii) social influence, which examines the impact of peers, educators, and the broader social context on adoption; and (iv) facilitating conditions, which encompass organizational support, including access to resources, training, and technical assistance.

Moderating factors such as age, experience, and gender are also considered significant in understanding adoption behaviours in educational settings (Al-Rahmi et al., 2020; Xue et al., 2024). When applied to DAPs, UTAUT provides a comprehensive lens to examine the interplay of individual, social, and organizational factors affecting adoption. The model's holistic approach underscores the importance of institutional backing and peer collaboration in successfully integrating DAPs into learning practices.

Connectivism

Connectivism, a contemporary learning theory, emphasizes the role of networking and collaboration in knowledge acquisition. It aligns seamlessly with the design and functionality of DAPs, which foster connectivity by enabling students to interact with peers, educators, and the broader digital arts community (Alam, 2023). Within DAPs, students engage in collaborative knowledge construction by sharing resources, ideas, and experiences. This peer-to-peer interaction enriches learning by incorporating diverse perspectives, reflecting the core principles of connectivism. Moreover, the use of DAPs cultivates digital literacy as students navigate vast information networks, develop problem-solving skills, and explore emerging digital art trends. By embedding connectivism principles, DAPs evolve into dynamic and participatory environments that encourage exploration, creativity, and continuous learning. They not only enhance the learning experience but also prepare students for the demands of a digitally interconnected world (Mukhlis et al., 2024).

Hypothesis development

The choice of UTAUT in this study is motivated by its proven effectiveness in studying technology adoption. The framework's constructs: performance expectancy, effort expectancy, social influence, and facilitating conditions offer valuable insights into the unique factors that influence the utilization of DAPs in education. These constructs have been contextualized to reflect the distinctive attributes of DAPs and their relevance to educational practices.

Performance expectancy

Performance expectancy refers to the belief that using DAPs will enrich learning experiences by fostering creativity, critical thinking, and collaboration among students in arts-related subjects. This construct explores how DAPs contribute to achieving educational goals, such as improving student engagement and learning outcomes in creative disciplines. The first hypothesis is stated as follows:

- H_1: Performance expectancy positively influences students' utilization of DAPs.

Effort expectancy

Effort expectancy relates to perceptions of how easy it is to use DAPs in educational settings. This includes aspects such as the simplicity of navigation, user-friendliness, and the effort required to integrate DAP activities into

teaching and learning workflows. Identifying potential usability challenges is critical for informing strategies to enhance DAP adoption. The second hypothesis is:

- H_2: Effort expectancy positively influences students' utilization of DAPs.

Social influence

Social influence examines the role of interpersonal relationships and social dynamics in shaping decisions to adopt DAPs. This includes the impact of peers, educators, and institutional norms on attitudes and behaviours related to DAP utilization. Understanding these dynamics highlights the role of collaboration and shared experiences in facilitating adoption. The third hypothesis is:

- H_3: Social influence positively influences students' utilization of DAPs.

Facilitating conditions

Facilitating conditions refer to the availability of resources and support systems that enable effective use of DAPs. This includes access to infrastructure, technical support, educator training, and institutional policies promoting technology integration. Assessing these factors helps identify barriers and informs strategies for improving DAP adoption. The fourth hypothesis is:

- H_4: Facilitating conditions positively influence students' utilization of DAPs.

Methodology

Study design

This study adopted a quantitative research design to investigate the factors influencing the utilization of DAPs among university students in South Africa. By systematically collecting and analysing numerical data, this approach identified the patterns, relationships, and trends that shape DAP usage. In the South African context, where efforts are underway to address educational challenges and bridge gaps in access and quality, the integration of digital tools such as DAP represents an innovative, technology-driven approach to learning. Understanding the factors influencing the adoption of such digital resources is essential for assessing their impact and contribution to the broader goals of enhancing education nationwide.

Sampling and participants

This study adopted a purposive sampling method to target South African university students with prior exposure to DAPs. These students were selected from arts and ICT academic disciplines, where the utilization of DAPs is most relevant. These fields were chosen because they align with the competencies fostered by DAPs, including creativity, collaboration, and digital literacy. By focusing on these disciplines, the study ensured that participants shared a common context, reducing variability in exposure and relevance. Arts students engage with DAP to enhance creative expression and multimedia skills, and ICT students explore its potential for digital innovation and problem-solving. To ensure reliable insights into DAP adoption, participants were included only if they had interacted with the platform for at least one semester, minimizing variability in usage experience. This approach provided a more granular understanding of how students' educational contexts and the duration of exposure influenced their perceptions and utilization of DAPs.

Data collection

Data was collected by distributing a structured questionnaire to students in arts, ICT, and education programs who had participated in DAP-related activities as part of their coursework. The questionnaire, based on the UTAUT framework, included items designed to measure exposure to DAPs, prior experience with digital tools, and students' perceptions of how relevant DAP was to their academic context. A Likert scale (1–5) was used to assess attitudes toward performance expectancy, effort expectancy, social influence, facilitating conditions, and actual usage of DAP.

To account for discipline-specific contexts, additional questions were included to evaluate how DAP impacted students in each field. For example, arts students were asked about its effect on creativity and multimedia skills, ICT

students on fostering digital innovation, and education students on enhancing teaching methodologies. The questionnaire also collected information on the duration of students' exposure to DAP and their academic disciplines, ensuring a comprehensive understanding of how exposure time and disciplinary contexts influenced the constructs identified by UTAUT. This approach provided nuanced insights into the factors driving DAP adoption across diverse educational contexts.

Data analysis

Data analysis involved two main techniques: exploratory factor analysis and regression analysis. Exploratory factor analysis was conducted to identify the underlying factors or dimensions within the collected data. This analysis helped to reduce the data complexity and identify the key factors influencing DAP utilization among South African university students. Exploratory factor analysis aided in exploring the structure of the questionnaire items and determining their factor loadings.

Additionally, regression analysis was performed to examine the relationship between the identified factors influencing DAP utilization and participants' demographic characteristics, such as age and gender. Multiple regression analysis was used to determine the predictive power of each factor of DAP utilization.

Results

Demographic profile

Table 1 reveals that the majority of respondents were male, comprising 60.2%, while females accounted for 39.4%. In terms of age, 97.8% of respondents were under 25 years old, with only 1.4% between 25 and 30, 0.4% between 31 and 49, and no respondents in the 41–50 age range, while one respondent was aged 50 or above (0.4%). The data indicates a predominance of younger respondents, particularly males, with an underrepresentation of older age groups. Regarding exposure to DAP, 72% of participants have used it for one semester, 18% for two semesters, and 10% for more than two semesters, reflecting varying levels of familiarity with the platform. Participants were distributed across academic arts and ICT disciplines, providing essential context for understanding the factors influencing DAP utilization.

Table 1: Demographics profile

Grouping		n	Percentage
Gender	Male	168	60.2
	Female	110	39.4
	Neutral	1	0.4
Age	< 25	273	97.8
	25–30	4	1.4
	31–49	1	0.4
	41–50	0	0.0
	50+	1	0.4

Evaluation of exploratory factor analysis

The results of the exploratory factor analysis demonstrated a satisfactory level of sampling adequacy, with a Kaiser-Meyer-Olkin index of 0.889 and Bartlett's test of sphericity ($\chi^2 = 4\,182$, df = 120, $p < 0.001$). These metrics confirmed that the data was suitable for factor analysis. The preliminary analysis identified five components – performance expectancy, effort expectancy, social influence, facilitating conditions, and DAP utilization based on an explained variance of 70%. In the subsequent refinement, Bartlett's test of sphericity ($\chi^2 = 3\,917$, df = 105, $p < 0.001$) further validated the appropriateness of the factor structure. Using principal axis factoring with Oblimin rotation, a five-factor solution emerged, accounting for 79.3% of the total variance. Each item demonstrated a factor loading greater than 0.4, indicating a strong association with its corresponding factor. This confirms that the items effectively represent the underlying constructs of performance expectancy, effort expectancy, social influence, facilitating conditions, and DAP utilization, as detailed in Table 2. Additionally, item FC2 was excluded from the model due to its low factor loadings and inconsistent cross-loading patterns with effort expectancy. This decision enhanced the clarity and coherence of the factor structure. Overall, the five-factor solution derived from the exploratory factor analysis offers a robust framework for understanding the factors influencing the utilization of DAP among the study participants.

Table 2: Factor loading matrix with Oblimin rotation

	Factor					
	1	2	3	4	5	Variance %
EE2	0.941					19.1
EE3	0.915					
EE1	0.891					
SI2		1.036				35.3
SI3		0.789				
SI1		0.735				
PE2			0.998			51.6
PE1			0.781			
PE3			0.771			
BI3				0.932		
BI2				0.854		66.1
BI1				0.573		
FC3					0.953	79.3
FC1					0.735	
FC4					0.615	

Note. The principal axis factoring extraction method was used in combination with an Oblimin rotation.
EE = effort expectancy, SI = social influence, PE = performance expectancy, BI = behavioural intention, FC = facilitating conditions

Regression analysis

The regression analysis indicates a statistically significant model, with $R^2 = 0.485$, suggesting that approximately 48.5% of the variance in DAP utilization is explained by the independent variables. A moderately strong positive correlation ($R = 0.696$) exists between the independent variables (effort expectancy, social influence, performance expectancy, facilitating conditions) and DAP utilization. The model's intercept value of 0.712 implies that when all independent variables are zero, the estimated baseline level of DAP utilization is 0.712. Among the predictors, effort expectancy and social influence exhibit positive and statistically significant coefficients (effort expectancy: 0.176, $\rho < 0.001$; social influence: 0.350, $\rho < 0.001$), indicating that higher perceived ease of use and stronger social influence are associated with increased DAP utilization. Although performance expectancy shows a positive coefficient (0.137) that approaches significance ($\rho = 0.050$), its effect on DAP utilization is weaker than the other factors. On the other hand, facilitating conditions demonstrate a positive and significant coefficient (0.170, $\rho < 0.001$), suggesting that improved support systems, such as technical assistance and access to resources, are linked to greater DAP utilization. Overall, these findings highlight the significant role of effort expectancy, social influence, and facilitating conditions in predicting DAP utilization, while performance expectancy has a comparatively weaker impact. Hypotheses H_2, H_3, and H_4 are confirmed, underscoring the importance of these factors in shaping students' engagement with DAP. Table 3 provides the model coefficients for the student DAP utilization.

Table 3: Model coefficients – Student DAP utilization

Predictor	Estimate	SE	t	p
Intercept	0.712	0.2225	3.20	0.002
PE	0.137	0.0698	1.97	0.050
EE	0.176	0.0446	3.94	< 0.001
SI	0.350	0.0669	5.23	< 0.001
FC	0.170	0.0434	3.91	< 0.001

PE = performance expectancy, EE = effort expectancy, SI = social influence, FC = facilitating conditions

Discussion

This study investigated the factors influencing the utilization of DAPs among participants at a South African university. The findings reveal a predominance of younger respondents, particularly males, with an underrepresentation of older age groups. Future studies should aim for a more balanced distribution of participants across age and gender to provide a more comprehensive context for interpreting the results. The study also underscores the importance of recognizing the diversity within university student populations when examining technology adoption. By focusing on participants from the arts and ICT disciplines, the study highlights how DAPs address the specific needs of students from the various academic contexts. Arts students valued the platform's ability to enhance creative expression and multimedia production, while ICT students appreciated its potential for fostering digital innovation. These findings demonstrate the need for tailored strategies when integrating digital tools such as DAPs into higher education curricula to optimize student engagement and learning outcomes.

The exploratory factor analysis identified five key factors: performance expectancy, effort expectancy, social influence, facilitating conditions, and DAP utilization, which together accounted for 79.3% of the variance, effectively capturing the constructs influencing DAP utilization. Regression analysis further supports these findings, revealing a statistically significant model that explains 48.5% of the variance. Among the predictors, effort expectancy, social influence, and facilitating conditions emerged as significant contributors, highlighting their role in promoting student engagement, while performance expectancy showed a weaker effect but approached significance. Additionally, longer exposure to DAPs was associated with higher levels of effort expectancy and social influence, suggesting that familiarity with the platform enhances perceptions of its usability and value.

The findings align with existing literature. For instance, previous studies identified performance expectancy and effort expectancy as key determinants of technology adoption, such as cloud storage services (Song et al., 2024) and gamified learning (Hsu, 2024). Similarly, Di Natale et al. (2024) identified facilitating conditions, performance expectancy, and effort expectancy as key determinants of technology usage among students in the metaverse. Research on digital playrooms and virtual learning environments also highlights the role of immersive settings in enhancing student engagement and motivation (Bećirović, 2023; Sweeny, 2023). These insights emphasize the importance of integrating DAPs into pedagogical practices to foster creativity, collaboration, and digital literacy, while addressing challenges such as infrastructure, training, and cultural adaptation. By designing strategies that align with the demands of an evolving technological landscape, educators can contribute to a more inclusive and innovative learning environment.

Understanding the factors influencing DAP utilization is crucial for fostering creativity, collaboration, and engagement while promoting skills such as digital literacy, critical thinking, and teamwork (Corbisiero-Drakos et al., 2021). By integrating DAPs into pedagogical practices, educators can design effective strategies that align with the demands of an evolving technological landscape. Additionally, identifying these factors enables a targeted approach to addressing challenges such as infrastructure, training, and cultural adaptation, contributing to a more inclusive learning environment (Deák & Kumar, 2024).

Conclusion and recommendations

DAP serves as an innovative educational tool, combining pedagogical approaches with technology-driven solutions. Through hands-on activities such as game design, multimedia projects, and digital arts creation, DAPs foster active learning, problem-solving, and creative expression (Al Hashimi et al., 2019; Samaniego et al., 2024). It bridges the gap between creative disciplines and digital innovation, aligning with 21st-century learning outcomes such as digital literacy, collaboration, and innovation. Practical applications include collaborative projects, gamified activities, and augmented and virtual reality tools, emphasizing DAPs transformative potential in education (Bećirović, 2023; Mamur et al., 2020).

This study provides valuable insights for educational practices, curriculum development, and future research on technology-enhanced learning. It informs strategies for integrating digital tools into curricula and suggest further exploration through qualitative approaches to better understand the factors influencing DAP utilization. By linking these findings to practical applications, the research enriches students' learning experiences and provides guidance for similar contexts globally. In the South African higher education landscape, where digital education tools are increasingly becoming vital for addressing systemic challenges such as the digital divide and resource disparities, these findings are particularly relevant. The emerging field of game studies illustrates the intersection of creativity, technology, and pedagogy, making platforms such as DAP essential.

Based on the findings, it is recommended that higher education institutions tailor their DAP implementation strategies according to the specific needs of various academic disciplines, such as arts, ICT, and education, in order to maximize the

platform's relevance and impact. Targeted training and resources should be provided to both educators and students, and infrastructure and technical support barriers have to be addressed to ensure equitable access. Institutions should foster interdisciplinary collaboration to enhance creativity and innovation. Future research should systematically examine the duration of exposure to DAPs and explore the specific needs of disciplines within the South African higher education context. These efforts will ensure that DAPs align with pedagogical goals and contribute to the evolving demands of game studies and digital education.

Research limitations

While this study provides valuable insights into the factors influencing DAP utilization among students, several limitations should be acknowledged. One limitation is the potential disparity in the availability and accessibility of DAPs across universities, stemming from differences in resources and infrastructure. Future research should collaborate with multiple institutions to ensure diverse student representation and address these variations. Another limitation is the reliance on self-reported data from surveys and questionnaires, which may introduce response biases or inaccuracies. To enhance the reliability of findings, future studies could adopt a mixed-methods approach, incorporating interviews, observations, or other qualitative methods alongside surveys. This would provide a more comprehensive understanding of DAP utilization while reducing potential biases.

ORCID

Oluwarotimi Randle: https://orcid.org/0000-0002-7948-1681

Kayode Oyetade: https://orcid.org/0000-0003-0516-0639

References

Al-Rahmi, A. M., Shamsuddin, A., & Alismaiel, O. A. (2020). Unified theory of acceptance and use of technology (UTAUT) Theory: The factors affecting students' academic performance in higher education. *Psychol. Educ. J*, *57*, 2839-2848.

Al Hashimi, S., Al Muwali, A., Zaki, Y., & Mahdi, N. (2019). The effectiveness of social media and multimedia-based pedagogy in enhancing creativity among art, design, and digital media students. *International Journal of Emerging Technologies in Learning (iJET)*, *14*(21), 176-190.

Alam, A. (2023). Connectivism learning theory and connectivist approach in teaching and learning: a review of literature. *Bhartiyam International Journal Of Education & Research*, *12*(2).

Alamri, H. A., Watson, S., & Watson, W. (2021). Learning Technology Models that Support Personalization within Blended Learning Environments in Higher Education. *TechTrends*, *65*(1), 62-78. https://doi.org/10.1007/s11528-020-00530-3

Alborzi, H., Druin, A., Montemayor, J., Platner, M., Porteous, J., Sherman, L., Boltman, A., Taxen, G., Best, J., & Hammer, J. (2000). Designing StoryRooms: Interactive storytelling spaces for children. Proceedings of the 3rd conference on Designing interactive systems: processes, practices, methods, and techniques,

Bećirović, S. (2023). Fostering Student Engagement in Implementing Digital Pedagogy. In S. Bećirović (Ed.), *Digital Pedagogy: The Use of Digital Technologies in Contemporary Education* (pp. 97-111). Springer Nature Singapore. https://doi.org/10.1007/978-981-99-0444-0_8

Chen, J.-C., Huang, Y., Lin, K.-Y., Chang, Y.-S., Lin, H.-C., Lin, C.-Y., & Hsiao, H.-S. (2020). Developing a hands-on activity using virtual reality to help students learn by doing. *Journal of Computer Assisted Learning*, *36*(1), 46-60. https://doi.org/https://doi.org/10.1111/jcal.12389

Corbisiero-Drakos, L., Reeder, L. K., Ricciardi, L., Zacharia, J., & Harnett, S. (2021). Arts integration and 21st century skills: A

study of learners and teachers. *International Journal of Education & the Arts*, *22*(2).

Davis, F. D., Granić, A., & Marangunić, N. (2024). *The technology acceptance model: 30 years of TAM*. Springer.

De Villiers Alethea, C., & Sauls Maxwell, M. (2017). Changing teachers' practice in the Creative Arts classroom : the case for educational technologies. *TD : The Journal for Transdisciplinary Research in Southern Africa*, *13*(1), 1-9. https://doi.org/10.4102/td.v13i1.371

Deák, C., & Kumar, B. (2024). A Systematic Review of STEAM Education's Role in Nurturing Digital Competencies for Sustainable Innovations. *Education Sciences*, *14*(3).

Di Natale, A. F., Repetto, C., Costantini, G., Riva, G., Bricolo, E., & Villani, D. (2024). Learning in the Metaverse: Are University Students Willing to Learn in Immersive Virtual Reality? *Cyberpsychology, Behavior, and Social Networking*, *27*(1), 28-36.

Dubey, M., & Sinha, K. (2023, 2023//). Digital Games as Tools of Innovative Pedagogy in Education. Polyphonic Construction of Smart Learning Ecosystems, Singapore.

Fancourt, D., & Mak, H. W. (2020). What barriers do people experience to engaging in the arts? Structural equation modelling of the relationship between individual characteristics and capabilities, opportunities, and motivations to engage. *PLoS One*, *15*(3), e0230487.

Gui, Y., Cai, Z., Yang, Y., Kong, L., Fan, X., & Tai, R. H. (2023). Effectiveness of digital educational game and game design in STEM learning: a meta-analytic review. *International Journal of STEM Education*, *10*(1), 36. https://doi.org/10.1186/s40594-023-00424-9

Haleem, A., Javaid, M., Qadri, M. A., & Suman, R. (2022). Understanding the role of digital technologies in education: A review. *Sustainable Operations and Computers*, *3*, 275-285. https://doi.org/https://doi.org/10.1016/j.susoc.2022.05.004

Hisey, F., Zhu, T., & He, Y. (2022). Use of interactive storytelling trailers to engage students in an online learning environment. *Active Learning in Higher Education*, *25*(1), 151-166. https://doi.org/10.1177/14697874221107574

Hsu, C.-L. (2024). Does a gamified website matter? An extended UTAUT model with regulatory fit, user experience, engagement, and attitudes. *Entertainment Computing*, *50*, 100658. https://doi.org/https://doi.org/10.1016/j.entcom.2024.100658

Ioannou, A. (2021). Learning games shifting to digital. *Educational Technology Research and Development*, *69*(1), 141-143. https://doi.org/10.1007/s11423-021-09948-9

Ishak, S. A., Hasran, U. A., & Din, R. (2023). Media Education through Digital Games: A Review on Design and Factors Influencing Learning Performance. *Education Sciences*, *13*(2).

Kalamatianou, M., & Hatzigianni, M. (2018). Teaching visual arts with digital technologies. *Digital Childhoods: Technologies and Children's Everyday Lives*, 197-213.

Khaleel, F. L., Ashaari, N. S., & Wook, T. (2020). The impact of gamification on students learning engagement. *International Journal of Electrical and Computer Engineering*, *10*(5), 4965-4972.

Makri, A., Vlachopoulos, D., & Martina, R. A. (2021). Digital Escape Rooms as Innovative Pedagogical Tools in Education: A Systematic Literature Review. *Sustainability*, *13*(8).

Mamur, N., Özsoy, V., & Karagöz, I. (2020). Digital learning experience in museums:

Cultural readings in a virtual environment. *International Journal of Contemporary Educational Research*, *7*(2), 335-350.

Mukhlis, H., Haenilah, E. Y., Maulina, D., & Nursafitri, L. (2024). Connectivism and digital age education: Insights, challenges, and future directions. *Kasetsart Journal of Social Sciences*, *45*(3).

Özdemir, D. (2022). A Conceptual Framework on the Relationship of Digital Technology and Art. *International Journal on Social and Education Sciences*, *4*(1), 121-134.

Samaniego, M., Usca, N., Salguero, J., & Quevedo, W. (2024). Creative Thinking in Art and Design Education: A Systematic Review. *Education Sciences*, *14*(2).

Sharma, B. P. (2022). Digital tools in art education: From expanding creative horizons and facilitating collaboration to increasing access and resources for a diverse student population. *Applied Research in Artificial Intelligence and Cloud Computing*, *5*(1), 55-65.

Shonfeld, M., Cotnam-Kappel, M., Judge, M., Ng, C. Y., Ntebutse, J. G., Williamson-Leadley, S., & Yildiz, M. N. (2021). Learning in digital environments: a model for cross-cultural alignment. *Educational Technology Research and Development*, *69*(4), 2151-2170. https://doi.org/10.1007/s11423-021-09967-6

Smiderle, R., Rigo, S. J., Marques, L. B., Peçanha de Miranda Coelho, J. A., & Jaques, P. A. (2020). The impact of gamification on students' learning, engagement and behavior based on their personality traits. *Smart Learning Environments*, *7*(1), 3. https://doi.org/10.1186/s40561-019-0098-x

Song, C.-H., Lee, J.-H., & Roh, T. (2024). Exploring the Cloud Storage Service Adoption Through the Dual Perspectives: Protection Motivation Theory (PMT) and the Extended Unified Theory of Technology Acceptance Model (UTAUT2). *International Journal of Human–Computer Interaction*, 1-18. https://doi.org/10.1080/10447318.2024.2327219

Sweeny, R. W. (2023). Digital and Postdigital Media in Art Education. *Studies in Art Education*, *64*(4), 401-405. https://doi.org/10.1080/00393541.2023.2273706

Timotheou, S., Miliou, O., Dimitriadis, Y., Sobrino, S. V., Giannoutsou, N., Cachia, R., Monés, A. M., & Ioannou, A. (2023). Impacts of digital technologies on education and factors influencing schools' digital capacity and transformation: A literature review. *Education and Information Technologies*, *28*(6), 6695-6726. https://doi.org/10.1007/s10639-022-11431-8

Tusiime, W. E., Johannesen, M., & Gudmundsdottir, G. B. (2022). Teaching art and design in a digital age: challenges facing Ugandan teacher educators. *Journal of Vocational Education & Training*, *74*(4), 554-574. https://doi.org/10.1080/13636820.2020.1786439

Wu, J., & Du, H. (2012). Toward a better understanding of behavioral intention and system usage constructs. *European Journal of Information Systems*, *21*(6), 680-698. https://doi.org/10.1057/ejis.2012.15

Xue, L., Rashid, A. M., & Ouyang, S. (2024). The Unified Theory of Acceptance and Use of Technology (UTAUT) in Higher Education: A Systematic Review. *Sage Open*, *14*(1), 21582440241229570. https://doi.org/10.1177/21582440241229570

Yang, X., Cheng, P.-Y., Liu, X., & Shih, S.-P. (2024). The impact of immersive virtual reality on art education: A study of flow state, cognitive load, brain state, and

motivation. *Education and Information Technologies*, *29*(5), 6087-6106. https://doi.org/10.1007/s10639-023-12041-8

Yıldırım, M. (2022). Digital Art in Children's Education. In B. K. Yerdelen, K. Elbeyoğlu, O. Sirkeci, Y. M. Işıkçı, S. Grima, & R. E. Dalli Gonzi (Eds.), *Being a Child in a Global World* (pp. 203-208). Emerald Publishing Limited. https://doi.org/10.1108/978-1-80117-240-020221021

Zubala, A., Kennell, N., & Hackett, S. (2021). Art therapy in the digital world: an integrative review of current practice and future directions. *Frontiers in psychology*, *12*, 595536.

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