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Influence of Computer Self-Efficacy, Socio-Economic Status, and Facilitating Conditions on the Learning Abilities of Digital Arts Students

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Abstract. The learning landscape of digital arts has been transformed by the integration of digital technology into creative education. Disparities in students' technological confidence, socio-economic backgrounds, and institutional support hinder equitable participation and learning outcomes. This study explored how computer self-efficacy, socio-economic factors, and facilitating conditions influence the academic learning needs of digital arts students at the University of the Witwatersrand, including motivation, engagement, and creative performance. The study employed a quantitative, correlational design based on Bandura's self-efficacy theory, Venkatesh et al.'s unified theory of acceptance and use of technology, and Bourdieu's theory of social capital. A stratified random sample of 120 students was selected from 400 digital arts students using a validated questionnaire. Structural equation modelling was used to analyse the relationships between the variables. The results indicated that computer self-efficacy and facilitating conditions were significant predictors of academic learning needs, while socio-economic factors had an indirect yet meaningful influence. The findings highlight the significance of digital confidence, institutional support, and resource accessibility in influencing student success in creative technology environments. The study concluded that a general approach is necessary to address the relationship between individual ability and environmental barriers. It is recommended that educational institutions implement digital literacy interventions, improve access to creative tools, and strengthen supportive infrastructure for inclusive and equitable digital arts education.

Keywords: computer self-efficacy; creative performance; digital arts; facilitating conditions; socio-economic factors

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1. Introduction

The rapid evolution of digital technologies has significantly transformed the educational sector, particularly in creative fields like digital arts. Digital arts blend technological innovations with creativity, which requires students to be versed in diverse software tools, multimedia production techniques, and design principles (Agbo, 2022; Nurhasanah & Ningsih, 2022; Onwuagboke, 2016).

Various socio-economic factors affect students' successful participation in digital arts. Computer self-efficacy, socio-economic status, and facilitating conditions play a crucial role in shaping students' ability to navigate and succeed in this dynamic field (Alabi & Abdullahi, 2022; Liu & Quanlin, 2023). Computer self-efficacy refers to an individual's belief in their ability to effectively use computer technology. It influences confidence, motivation, and problem-solving skills in technology-driven learning environments (Bandura, 1997; Chong & Reinders, 2025; Lan & Zhou, 2025; Zimmerman, 2000). Students with higher levels of computer self-efficacy tend to experiment more, persevere when faced with challenges, and achieve better learning outcomes in digital arts programmes (Doğru, 2020; Farida et al., 2025; Olivares & Piatak, 2021; Lin et al., 2025).

Socio-economic factors play a significant role in influencing educational experiences. According to Aboagye et al. (2022), access to advanced hardware, specialised software, and stable internet connectivity plays an essential role in recording success in digital arts. However, differences in socio-economic status can limit students' access to essential resources, which in turn creates unequal opportunities for enhancing creativity and developing skills (Memon et al., 2025). Students from economically disadvantaged backgrounds often experience technological exclusion, which can hinder their academic engagement, creative expression, and career prospects in the digital arts industry. It is important to address this divide to ensure that access to learning resources is equal, thereby promoting inclusive learning (Olivares & Piatak, 2021).

Facilitating conditions within the educational environment are crucial for determining student success. Facilitating conditions involve the availability of technological resources, mentorship, institutional support, and the presence of collaborative learning spaces (Agbo, 2022; Venkatesh et al., 2003). These factors influence how students engage with creative software, participate in practical activities, and navigate challenges. When facilitating conditions are present, students are more likely to develop confidence in their creative abilities and maintain a positive learning experience (Deci & Ryan, 2000; Lin et al., 2019; Randle, 2024; Venkatesh et al., 2012; Zimmerman & Schunk, 2011). However, the lack of sufficient support mechanisms can lead to frustration, disengagement, and reduced academic performance (Doğru, 2020).

While previous studies have examined the individual roles of computer self-efficacy, socio-economic status, and facilitating conditions, there is a gap in the literature regarding integrative research that explores how these factors interact to influence student engagement, motivation, and performance in digital arts education. Most previous research has focused on each variable in isolation, either analysing how socio-economic status limits access or how self-efficacy predicts performance, without examining the complex, interdependent relationships

between these constructs (Nurhasanah & Ningsih, 2022; Onwuagboke, 2016). This fragmented approach hinders a comprehensive understanding of the lived experiences of digital arts students, especially in educational settings with limited resources.

Therefore, the present study sought to address this critical gap by investigating how computer self-efficacy, socio-economic factors, and facilitating conditions interact with and influence the academic learning needs of digital arts students. By adopting an integrated analytical approach, the study provided a deeper understanding of how these dimensions collectively shape learners' motivation, engagement, and creative output. Such understanding is essential for informing the design of equitable and inclusive educational strategies that empower all students, regardless of their backgrounds, to reach their full creative potential.

This study addressed the significant barriers that many digital arts students encounter in engaging effectively. These barriers stem from varying levels of computer self-efficacy, socio-economic inequalities, and insufficient facilitating conditions. These challenges often lead to limited access to creative tools, reduced self-confidence, and suboptimal academic outcomes. Without a clear understanding of how these factors work together to influence students' experiences, educational institutions may continue to implement fragmented solutions that fail to address the underlying causes of exclusion and underperformance. By addressing these interconnected issues, this research aimed to contribute to the development of inclusive frameworks that support student creativity, digital fluency, and academic success in the digital arts landscape of the 21st century.

To address the identified problem, this study was guided by the following research questions:

- RQ1. How does computer self-efficacy influence digital arts students' motivation, engagement, and creative performance?
- RQ2. To what extent do socio-economic factors affect students' access to digital arts resources and their creative output?
- RQ3. How do the facilitating conditions in educational institutions affect students' learning experiences and academic success in digital arts programmes?

The study aimed to address these questions to generate insights that can encourage policies, enhance instructional design, and provide institutional support for digital arts education. This research might contribute to a deeper understanding of the factors that influence students' success and provide evidence-based recommendations for creating an inclusive and empowering learning environment for digital arts students.

2. Literature Review

The rise of digital technology has significantly transformed the educational landscape, particularly in creative fields such as digital arts (McKenna & Richardson, 2022; Mishra & Koehler, 2006). The integration of technology into

artistic practice demands the development of new skills and competencies. Three critical factors shape success in digital arts education: computer self-efficacy, socio-economic factors, and facilitating conditions. These factors are interconnected and influence learning outcomes, motivation, and engagement in digital arts education. Understanding how these factors interact can offer valuable insights into effective educational practices and create a more equitable learning environment.

2.1 Computer Self-Efficacy

Computer self-efficacy refers to an individual's belief in their ability to successfully perform tasks using computer technology, which plays a crucial role in digital arts education. According to Bandura's (1997) social cognitive theory, self-efficacy is a crucial factor in determining motivation and performance. Students with higher computer self-efficacy are more likely to approach digital art tasks with increased confidence, persistence, and creativity. Doğru (2020) found that pre-service visual arts teachers with higher levels of computer self-efficacy exhibited more positive attitudes toward web-based instruction.

This highlights the influence of self-efficacy on students' readiness to use digital platforms for creative tasks. Onwuagboke's (2016) research revealed that self-efficacy is a significant predictor of success in graphic design courses. Students with higher self-efficacy are more likely to experiment with creative designs and complete projects successfully. Calaguas and Consunji (2022) studied self-efficacy in online learning environments and found it a significant predictor of student performance in online creative courses, which highlights the importance of self-efficacy in digital arts education.

2.2 Socio-Economic Factors

Socio-economic factors play a fundamental role in determining access to digital arts education. Economic disparities affect access to technological tools, high-speed internet, and other essential resources for effective participation in digital learning. Students from low-income families often encounter difficulties in accessing advanced software, digital drawing tablets, and other essential learning materials (Azevedo et al., 2021; Reisdorf & Groselj, 2017; Warschauer & Matuchniak, 2010). Satar's (2020) research demonstrated that socio-economic status significantly affects access to digital resources, creating a digital divide that limits opportunities for economically disadvantaged students in creative education.

Olivares and Piatak (2021) noted that socio-economic disparities influence participation in creative fields, with wealthier students having greater access to museums, artistic workshops, and digital learning environments. This gap leads to inequalities in acquiring the technical skills needed for digital arts. Whitaker and Wolniak (2022) observed that low socio-economic status limits access to high-quality educational resources, which hinders ability to engage in meaningful learning. Without equitable access to these resources, digital arts education could exclude economically disadvantaged students, thereby perpetuating systemic inequalities.

2.3 Facilitating Conditions

Facilitating conditions, including access to institutional resources, tools, and technological support, play a vital role in enabling students to succeed in digital arts education. Facilitating conditions are a key component of Venkatesh et al.'s (2003) unified theory of acceptance and use of technology (UTAUT). This theory posits that having access to resources and technical support improves the acceptance and use of technology. Facilitating conditions are especially important in digital arts education, as access to specialised software, studio space, and high-performance devices is crucial for success. Aboagye et al. (2022) as well as Randle and Kayode (2025) demonstrated that well-equipped digital studios and access to technical support significantly enhance engagement in the digital creative arts.

Students who have access to updated software, collaborative online platforms, and sufficient instructional support are more likely to succeed in creating digital art. Venkatesh et al. (2003) emphasised that adequate support systems influence technology use. This finding is relevant to digital arts, where access to technical assistance can mitigate the effects of socio-economic inequality. This dynamic is supported by Agbo (2022) who noted that access to studio resources and interactive online platforms positively affects creative performance and engagement in digital arts education.

2.4 Relationship Between Key Variables and Student Motivation and Engagement in Technology-Enhanced Learning

Recent digital transformation of learning environments necessitates a closer examination of psychological, socio-contextual, and infrastructural factors that influence student engagement and motivation. In technology-enhanced learning environments, particularly in digital arts that require both technical proficiency and creative innovation, student outcomes are increasingly influenced by related factors such as computer self-efficacy, socio-economic status, and facilitating conditions.

Computer self-efficacy is crucial for determining engagement and persistence in technology-enhanced learning environments. Ollonen and Kangas (2024) argued that students with higher academic and online self-efficacy demonstrate greater autonomy, cognitive engagement, and strategic use of support mechanisms such as scaffolding. Their study investigated the interaction between self-efficacy and scaffolding in digital environments. The findings revealed that learners with high self-efficacy are better equipped to use technological resources, which boosts both their motivation to learn and overall academic performance. In digital arts education, where students often use complex software and multimedia tools, computer self-efficacy is a predictor of technical competence and a key factor in fostering sustained engagement and encouraging creative risk-taking (Ollonen & Kangas, 2024).

Socio-economic factors significantly affect digital engagement and learning equity. In an exploratory study on digital skills among students from various socio-economic backgrounds in Germany, Heinz (2016) found that students from higher socio-economic strata had greater exposure to digital technologies, resulting in more positive attitudes toward digital learning and stronger digital literacy. The digital divide has significant implications for motivation and

engagement. Limited access to digital tools and stable learning environments can undermine confidence and hinder participation in technology-enhanced learning. Digital arts students may face socio-economic disparities that limit their access to essential creative technologies, affecting their emotional and behavioural engagement with digital learning platforms.

Facilitating conditions, including institutional support structures, access to digital tools, and the availability of technical assistance, play a crucial role in shaping the motivation of students and engagement in technology-enhanced learning. Zhou et al. (2023) investigated the role of digital technologies in Chinese high school art education. They found that enabling conditions such as teacher support, access to relevant software, and a conducive digital infrastructure significantly influence creative engagement and willingness to experiment (Zhou et al., 2023). These findings align with Wang et al.'s (2024) study, which further demonstrated that while digital competence and facilitating conditions improve learning outcomes in higher education, their effects are influenced by psychological variables such as technostress. Elevated levels of technostress, without supportive conditions, were found to undermine both student engagement and digital self-efficacy.

Combining these perspectives reveals a dynamic relationship between the study's core variables and student motivation and engagement. Computer self-efficacy enhances intrinsic motivation by strengthening students' confidence in their ability to master digital tools. Additionally, socio-economic status influences the level of exposure and familiarity with digital environments. Lastly, providing facilitating conditions, both structural and emotional, is essential for maintaining sustained engagement. These factors provide a foundation for understanding how students navigate technology-enhanced learning environments, particularly in skill-intensive fields such as digital arts. This study contributes to the ongoing discussion about how student-centred and equitable design in technology-enhanced environments can optimise learning engagement and improve motivational outcomes.

3. Theoretical Framework

This study is based on three interconnected theories: Bandura's (1997) self-efficacy theory, Venkatesh et al.'s (2003) UTAUT, and Bourdieu's (1986) theory of social capital.

Bandura's self-efficacy theory serves as the fundamental theoretical framework for this study. Bandura (1997) defines self-efficacy as an individual's belief in their ability to successfully perform the behaviours required to achieve specific outcomes. In digital arts education, self-efficacy, especially computer self-efficacy, is essential as it affects students' confidence in using complex digital design tools, creative software, and other technological systems necessary for their field. Self-efficacy affects persistence, adaptability, and creativity, which are essential traits for design and animation students. Higher self-efficacy levels are associated with better academic performance, increased motivation, and greater engagement with new technology (Doğru, 2020; Zimmerman, 2000). Empirical studies show a connection between computer self-efficacy and academic performance in design-related fields. Onwuagboke (2016) found that students with higher self-efficacy achieved significantly better results in computer-aided design courses. This

relationship highlights the vital role that self-efficacy plays in students' engagement with and mastery of digital arts technologies.

The UTAUT model by Venkatesh et al. (2003) provides a robust lens for examining how facilitating conditions influence students' ability to engage with technology in digital arts education. The UTAUT model identifies four primary constructs – performance expectancy, effort expectancy, social influence, and facilitating conditions – that predict technology acceptance and use. Facilitating conditions emphasise the availability of resources, infrastructure, and technical support required for effective technology use. In digital arts education, access to creative software, design tools, and high-performance devices is a crucial facilitating condition for student engagement and performance. Venkatesh et al. (2003) argued that access to technical resources reduces the barriers to technology usage, while technical support increases confidence in using advanced software.

Empirical research by Aboagye et al. (2022) found that students with access to well-equipped digital studios and technical support staff demonstrated greater creative engagement and academic performance. Access to specialised software, like Adobe Photoshop, three-dimensional modelling programs, and animation suites, increases the likelihood of students engaging in creative experimentation and digital innovation (Agbo, 2022). Consequently, the role of facilitating conditions, as proposed by UTAUT, is crucial for ensuring digital arts students have the necessary resources and support to thrive in a highly technological learning environment.

Bourdieu's (1986) theory of social capital provides a sociological perspective on how socio-economic factors affect students' educational experiences. Bourdieu (1986) defines social capital as the resources that individuals can access through their relationships, social networks, and family connections. From this perspective, socio-economic factors such as household income, access to resources, and social networks affect access to digital learning tools and technology. Wealthier students are more likely to have access to industry-standard creative tools, high-end design software, and professional mentorship from their networks, giving them an advantage in digital arts education.

Students from lower socio-economic backgrounds often struggle to access high-speed internet, creative software, and the modern devices needed for digital design and animation. The concept of 'digital divide' highlights this disparity, as students from low-income households often have limited access to the digital resources needed for success in the creative arts (Satar, 2020; Whitaker & Wolniak, 2022).

Olivares and Piatak (2021) found that socio-economic disparities influence access to creative learning opportunities. Students from wealthier families are more likely to attend workshops, participate in exhibitions, and receive training in artistic design. This supports Bourdieu's (1986) assertion that access to social capital is a privileged resource that influences educational outcomes. When applied to digital arts education, Bourdieu's (1986) theory demonstrates how socio-economic inequalities create barriers to learning, hindering students' ability to engage in creative projects, access software, and produce high-quality creative

work. This insight emphasises the importance of universities and institutions in providing equitable access to design tools, software licences, and resource-rich learning environments for students from disadvantaged socio-economic backgrounds.

In the context of this study, Bandura's (1997) self-efficacy theory explains the cognitive dimension of how students perceive their ability to engage with design software, animation tools, and digital technologies. Venkatesh et al.'s (2003) UTAUT framework addresses the technological dimension by emphasising how facilitating conditions, such as access to resources and support systems, determine student engagement with digital arts technology. Bourdieu's (1986) theory of social capital highlights the social dimension, demonstrating how socio-economic factors and social networks affect access to resources, mentorship, and creative learning opportunities.

4. Method

A quantitative correlational research design was employed to investigate how computer self-efficacy, socio-economic status, and facilitating conditions predict the learning abilities of digital arts students at the University of the Witwatersrand. Based on institutional records, the total population of digital arts students was 400, which served as the population for this study. This population was deemed suitable because it provided a comprehensive representation of diverse academic experiences, socio-economic backgrounds, and digital competence relevant to the study's variables.

Given logistical constraints such as time, cost, and the availability of respondents, a sample size of 120 was considered both manageable and statistically sufficient, representing 30% of the total population. This proportion exceeds the 10% minimum recommended threshold for small populations ($N \leq 1000$) in social science research (Gay et al., 2011), which ensures both representativeness and reliability. Stratified random sampling was used as sampling technique. The population was initially divided by academic level (first year, second year, third year, fourth year, and master's) to ensure proportional representation of each group. Within each category, participants were randomly selected using simple random sampling to eliminate bias and give every student an equal chance of being chosen. This approach ensured the sample reflected the diverse experiences and backgrounds of digital arts students across all academic levels.

Data were collected using a structured online questionnaire with established five-point Likert scales: the computer self-efficacy scale (Şendurur & Yıldırım, 2019), a socio-economic status inventory adapted from the Organisation for Economic Co-operation and Development (OECD) (Avvisati & Wuyts, 2024), and the UTAUT facilitating conditions subscale (Venkatesh et al., 2003). A pilot test with 15 students evaluated the instrument's clarity and reliability, achieving a Cronbach's alpha of 0.78 or higher. After obtaining institutional ethics approval and informed consent, surveys were conducted over a ten-day period using SurveyMonkey.

After eliminating incomplete and inconsistent responses, 90 valid responses were retained for analysis. The quantitative data were analysed using SPSS version 27. The sample was characterised using descriptive statistics. Bivariate associations

were tested with Pearson's correlation coefficient (r), and hierarchical multiple regression was employed to assess the unique and combined contributions of the predictor variables to learning ability, with significance established at $p < 0.05$.

Table 1: Relevance of objectives of teaching subjects at the university

Demographics	Items	Frequency	Percentage
Gender	Male	53	58.89
	Female	37	31.11
Race	White	21	23.33
	Black	69	76.67
Age	Younger than 18	19	21.11
	18–20	35	38.89
	21–29	19	21.11
	30–36	9	10.00
	Older than 36	8	8.89
Year of study	First year	28	31.11
	Second year	24	26.67
	Third year	17	18.89
	Fourth year	13	14.44
	Master's degree	8	8.89
Access to technology before university	Yes	74	82.22
	No	16	17.78
Total		**90**	**100**

Source: Survey data from online questionnaire (2024)

5. Instrument Development

A five-point Likert scaled questionnaire was designed for the study with four constructs: academic learning needs as the endogenous variable, as well as computer self-efficacy, facilitating conditions, and socio-economic conditions as the exogenous variables. The instrument was developed using validated scales from previous research to assess the core constructs of computer self-efficacy, socio-economic factors, and facilitating conditions, as well as their influence on motivation, engagement, and creative performance among digital arts students.

The concept of computer self-efficacy was adapted from Bandura (1997), Compeau and Higgins (1995), and Şendurur and Yıldırım (2019). Socio-economic factors were derived from research by Heinz (2016), the OECD (Avvisati & Wuyts, 2024), and Olivares and Piatak (2021). Facilitating conditions were informed by studies conducted by Aboagye et al. (2022) and Venkatesh et al. (2003, 2012). Lastly, the academic learning needs component was developed by the researchers, drawing on the work of Deci and Ryan (2000), as well as Lin et al. (2019).

5.1 Computer Self-Efficacy

A confirmatory factor analysis was performed to assess the validity of the instrument. The test was conducted in accordance with the guidelines set by Schumacker and Lomax (2004), which specify that the standardised factor loadings of items should not be less than 0.5. Based on this criterion, the construct originally included nine items; however, items 1, 2, 3, and 4 were removed due to

their low factor loadings. The standardised factor loadings for the remaining five items were all above 0.50, ranging from 0.534 to 0.832. The fit index of the instrument was acceptable, with $\chi 2 = 86.559$, degrees of freedom (df) = 34; p value = 0.000; $\chi 2/df = 2.546$; incremental fit index (IFI) = 0.921; Tucker–Lewis index (TLI) = 0.993; comparative fit index (CFI) = 0.972; root mean square error of approximation (RMSEA) = 0.071; and root mean square residual (RMSR) = 0.017. Additionally, the Cronbach's alpha for this construct was 0.887 and the composite reliability was above 0.6, indicating that the instrument demonstrated acceptable reliability.

5.2 Academic Learning Needs

This construct consisted of seven items designed to examine how students use gamified technology to meet their academic needs. The results of the confirmatory factor analysis indicated that the factor loadings for items 1, 2, 3, 5, and 6 were above 0.5, while items 4 and 7 had factor loadings below 0.5. As a result, items 4 and 7 were removed due to their low factor loadings. The loadings for items 1, 2, 3, 5, and 6 ranged from 0.525 to 0.950. The fit index of the instrument was acceptable, with $\chi 2 = 30.9$; df = 5; p value = 0.003; $\chi 2/df = 6.12$; IFI = 0.962; TLI = 0.917; CFI = 0.909; RMSEA = 0.081; and RMSR = 0.025. The reliability test indicated that the Cronbach's alpha was 0.846 and the composite reliability was 0.992, confirming the construct's reliability.

5.3 Facilitating Conditions

This construct aimed to assess how the availability of certain technical factors influences students' use of playroom tools. The construct consisted of six items, and a confirmatory factor analysis and a reliability test were conducted to verify the items' reliability and factor loadings. The results indicated that items 3, 4, and 5 had loadings greater than 0.5, while the other items had factor loadings below 0.5, which were therefore removed. The fit index of the construct was acceptable with $\chi 2 = 64.328$; df = 8; p value = 0.001; $\chi 2/df = 8.04$; IFI = 0.912; TLI = 0.984; CFI = 0.943, RMSEA = 0.084; and RMSR = 0.031. Additionally, the reliability test confirmed that the construct was reliable, with a Cronbach's alpha of 0.700 and a composite reliability of 0.914.

5.4 Socio-Economic Factors

This construct consisted of three items designed to examine the societal and economic factors that affect students' use of the playroom. A confirmatory factor analysis and a reliability test were conducted to validate its validity and reliability. The confirmatory factor analysis indicated that all three items had factor loadings above 0.5, with values ranging from 0.816 to 0.924. The fit index of the construct was deemed acceptable, with values of $\chi^2 = 53.247$, df = 9; p value = 0.001; $\chi 2/df = 5.91$; IFI = 0.964; TLI = 0.918; CFI = 0.933; RMSEA = 0.089; and RMSR = 0.028. Additionally, the reliability test indicated a Cronbach's alpha of 0.808 and a composite reliability of 0.769, further confirming the construct's reliability.

5.5 Correlation Between Construct Results

Table 2 presents the reliability test results for the items associated with each construct as outlined in the questionnaire. The table lists only the items that were retained after the confirmatory factor analysis.

Table 2: Validity and reliability of the instrument

Factor	Indicator	Loadings	Composite Reliability	Average Variance Extracted	Cronbach's Alpha
Computer self-efficacy	CSE5	0.534	0.725	0.736	0.887
	CSE6	0.621			
	CSE7	0.818			
	CSE8	0.832			
	CSE9	0.557			
Academic learning needs	ALN1	0.885	0.992	0.642	0.846
	ALN2	0.950			
	ALN3	0.557			
	ALN5	0.550			
	ALN6	0.525			
Facilitating conditions	FCL4	0.773	0.914	0.637	0.700
	FCL5	0.647			
	FCL3	0.441			
Socio-economic factors	SEF1	0.924	0.769	0.682	0.808
	SEF2	0.992			
	SEF3	0.818			

Source: Survey data from online questionnaire (2024)

Regarding factor loadings, most items displayed standardised loadings of 0.5 or higher, which met the threshold for acceptable item validity recommended by Schumacker and Lomax (2004). All composite reliability values exceeded 0.7, with computer self-efficacy at 0.725 and academic learning needs at 0.992. This indicates that the items in each construct demonstrated a high level of internal consistency. Cronbach's alpha values were above the 0.70 benchmark, with computer self-efficacy at 0.887 and academic learning needs at 0.846, indicating that the scales used are reliable.

The average variance extracted values ranged from 0.637 to 0.736 across different constructs, indicating that these constructs explain more than 50% of the variance in their observed variables. This suggests a strong level of convergent validity (Fornell & Larcker, 1981). It implies that the instrument is both valid and reliable for measuring the effects of computer self-efficacy, socio-economic factors, and facilitating conditions on students studying digital arts. The strong psychometric properties support the credibility of the subsequent statistical analyses, including structural modelling.

Table 3 presents the means, standard deviation (SD), and Pearson correlation coefficients for the key variables: computer self-efficacy, facilitating conditions, academic learning needs, and socio-economic factors.

Table 3: Descriptive statistics and intercorrelations between variables

Variables	Mean	SD	1	2	3
Computer self-efficacy	3.26	0.93			
Facilitating conditions	3.76	0.91	0.656		
Academic learning needs	3.35	0.95	0.233	0.880	
Socio-economic factors	2.85	1.17	0.043	0.125	0.752

Source: Survey data from online questionnaire (2024)

All variables had mean (*M*) values ranging from 2.85 to 3.76. The highest score was for facilitating conditions ($M = 3.76$), suggesting that students generally perceive institutional support as satisfactory. Socio-economic factors ($M = 2.85$) had the lowest score, indicating significant disparities in the economic backgrounds of the students.

Correlations:

- Computer self-efficacy and facilitating conditions ($r = 0.656$): A strong positive correlation suggests that students with higher self-efficacy are more likely to perceive greater institutional support.
- Academic learning needs and facilitating conditions ($r = 0.880$): A very strong positive correlation implies that academic learning needs are greatly influenced by the institutional facilities and support available to students.
- Academic learning needs and computer self-efficacy ($r = 0.233$): A modest positive relationship, indicating that while self-efficacy plays a role in meeting academic needs, it is not the only determinant involved.
- The correlations of socio-economic factors with other variables are weak (socio-economic factors and academic learning needs: $r = 0.752$; socio-economic factors and facilitating conditions: $r = 0.125$; and socio-economic factors and computer self-efficacy: $r = 0.043$), suggesting that socio-economic status has a relatively weak, yet notable influence.

These relationships support the structural model's hypothesis that facilitating conditions and self-efficacy are strong predictors of students' engagement and abilities in digital arts. In contrast, socio-economic status, while relevant, may have only indirect effects.

Table 4 demonstrates that the measurement model is statistically robust. All indicators load significantly onto their respective latent variables, which provides compelling evidence for construct validity. The strong loadings and narrow confidence intervals indicate that the instrument accurately captures the constructs, supporting its use in the structural model.

Table 4: Measurement model

				95% Confidence Intervals				
Latent	**Observed**	**Estimate**	**SE**	**Lower**	**Upper**	β	z	p
Academic learning needs	ALN1	1.000	0.0000	1.000	1.000	0.930		
	ALN2	1.045	0.0663	0.915	1.175	0.971	15.76	< .001
	ALN3	0.753	0.0597	0.636	0.870	0.700	12.61	< .001
	ALN5	0.753	0.0596	0.636	0.869	0.700	12.63	< .001
	ALN6	0.699	0.0747	0.553	0.846	0.650	9.35	< .001
Facilitating conditions	FCL3	1.000	0.0000	1.000	1.000	0.493		
	FCL4	1.919	0.2683	1.394	2.445	0.947	7.15	< .001
	FCL5	1.780	0.2569	1.276	2.283	0.878	6.93	< .001
Socio-economic factors	SEF1	1.000	0.0000	1.000	1.000	0.707		
	SEF2	1.329	0.1522	1.031	1.627	0.940	8.74	< .001
	SEF3	1.154	0.1105	0.937	1.370	0.815	10.44	< .001
Computer self-efficacy	CSE5	1.000	0.0000	1.000	1.000	0.811		
	CSE6	1.170	0.0777	1.018	1.322	0.949	15.07	< .001
	CSE7	1.160	0.0657	1.032	1.289	0.941	17.67	< .001
	CSE8	1.113	0.0605	0.995	1.232	0.903	18.39	< .001
	CSE9	0.799	0.0848	0.633	0.965	0.649	9.43	< .001

Source: Survey data from online questionnaire (2024)

Figure 1 provides a visual representation of the results from the structural model.

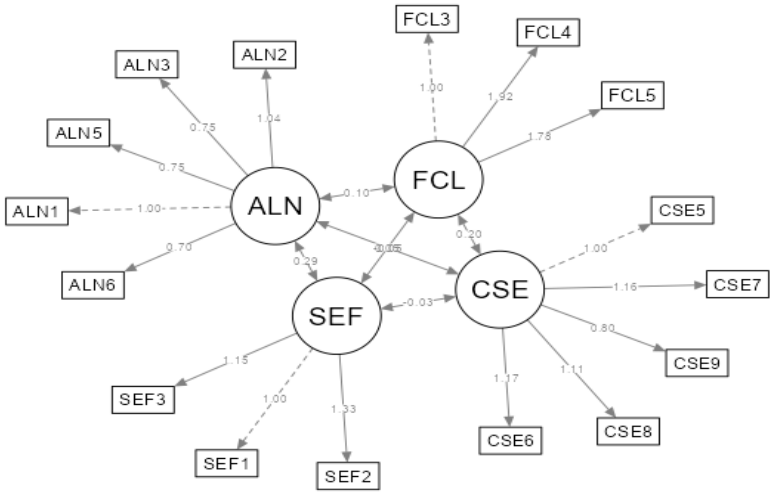

Figure 1: Results of the structural model

6. Discussion of the Findings

The analysis of the data aligned with the three objectives of the study, which were (i) to assess the influence of computer self-efficacy on digital arts students' motivation, engagement, and creative performance; (ii) to examine the extent to which socio-economic factors affect students' access to digital arts resources and their creative output; and (iii) to evaluate how facilitating conditions in educational institutions affect learning experiences and academic success.

6.1 Influence of Computer Self-Efficacy on Motivation, Engagement, and Creative Performance

The results revealed a strong and statistically significant relationship between computer self-efficacy and academic learning needs. The confirmatory factor analysis showed that the retained self-efficacy items (CSE5 to CSE9) had standardised factor loadings between 0.534 and 0.832, demonstrating excellent internal reliability (Cronbach's alpha = 0.887) and construct validity (composite reliability = 0.725; average variance extracted = 0.736). The measurement model indicated that self-efficacy was a significant predictor of motivation and engagement with digital tools ($\beta = 0.940$ for SEF2 and $\beta = 0.941$ for CSE7; $p < 0.001$).

These findings affirmed the central premise of Bandura's (1997) self-efficacy theory, which asserts that individuals who are confident in their ability to use technology are more likely to engage in tasks, persevere through challenges, and exhibit creative problem-solving skills. In digital arts, this means that students with higher self-efficacy feel empowered to explore complex design software, experiment with innovative techniques, and complete digital projects independently. This supported the perspective of Zimmerman and Schunk (2011) that self-efficacy not only enhances academic persistence but also fosters deeper creative engagement.

This finding aligns with recent literature. Ollonen and Kangas (2024) found that students with high online self-efficacy are more likely to take ownership of their

learning and demonstrate strategic thinking in digital environments, resulting in improved academic outcomes. Calaguas and Consunji (2022) similarly emphasised that computer self-efficacy is a significant predictor of performance and emotional engagement in online creative courses. Thus, in the context of digital arts, self-efficacy serves as both a psychological motivator and a cognitive facilitator for student creativity.

6.2 Socio-Economic Factors and Students' Access to Digital Arts Resources and Creative Output

The data indicated that socio-economic factors significantly influence access to digital tools and, as a result, students' ability to meet their academic learning needs. The socio-economic factors construct demonstrated strong reliability (Cronbach's alpha = 0.808) and high item loadings (SEF2 = 0.992; SEF1 = 0.924). Despite its high reliability, the descriptive data revealed lower mean scores for socio-economic variables (M = 2.85), indicating that many students experience resource constraints.

These results addressed the core issue of digital inequality within the context of the study. Students from lower socio-economic backgrounds often have limited access to essential resources such as laptops, design software, and reliable internet connectivity. This supported claim made by Satar (2020) and Warschauer and Matuchniak (2010) that socio-economic status is a crucial factor in determining digital engagement and academic equity in creative disciplines. This was consistent with the findings of Becker (2000), who asserted that disparities in socio-economic status affect access to technological resources, resulting in a 'digital divide' in educational outcomes. Warschauer (2004) emphasised that students who have access to advanced digital tools are more likely to produce high-quality creative work, whereas those without access experience delays and produce lower-quality results.

Recent empirical findings support this conclusion. Heinz (2016), in a study of German schools, demonstrated that socio-economic disparities have a direct impact on students' acquisition of digital skills and their participation. Similarly, Olivares and Piatak (2021) found that wealthier students are more likely to have access to artistic resources and training opportunities, which allows them to produce higher quality creative work. These disparities create systemic disadvantages for lower-income students, reinforcing the need for policy interventions in higher education.

In this study, this was evident in the finding that only 17.78% of students reported having no access to technology before attending university. This suggested a pre-existing divide that is likely to affect engagement and performance after enrolment. Addressing socio-economic constraints is crucial for ensuring equitable access to digital arts education. Strategies such as providing scholarships, grants, and access to institutional resources can help bridge this gap and enhance students' creative abilities.

6.3 Impact of Facilitating Conditions on Students' Learning Experiences and Academic Success

Facilitating conditions in educational institutions significantly affect learning experiences and academic success. The confirmatory factor analysis of the facilitating conditions construct revealed that three items (FCL3, FCL4, and FCL5) had acceptable factor loadings, with values of 0.441, 0.773, and 0.647, respectively. The fit indices of the confirmatory factor analysis model were satisfactory ($\chi 2 = 64.328$; df = 8; $\chi 2/df = 8.04$; CFI = 0.943; TLI = 0.984; IFI = 0.912; and RMSEA = 0.084). The Cronbach's alpha of 0.700 confirmed the reliability of the construct.

These findings implied that students are more likely to succeed when institutions provide adequate support, such as access to digital studios, practical labs, technical assistance, and flexible learning environments. Venkatesh et al. (2003) emphasised that facilitating conditions play a significant role in the adoption of technology in educational settings. Their study supported the view that institutions with dedicated support systems enable students to overcome learning barriers, resulting in better academic outcomes (Venkatesh et al., 2003).

This study's findings revealed that institutions can enhance students' experiences by implementing interventions such as practice playrooms, providing access to the latest software, and ensuring timely technical support. The data indicated that 84 out of 90 students (93.33%) had access to technology before entering university. Prior access may have helped students navigate and use digital tools effectively. Al-Fraihat et al. (2020) similarly found that facilitating conditions, such as infrastructure, technical support, and accessibility, are critical factors to the success of e-learning and student engagement. This highlighted the importance of educational institutions creating strong support systems to help students engage with and succeed in digital arts programmes.

6.4 Interdependent Relationships Between the Constructs

This study demonstrated that the constructs of self-efficacy, socio-economic status, and facilitating conditions do not operate in isolation; rather, they interact in complex ways to shape learning outcomes. For instance, students from disadvantaged socio-economic backgrounds who report low self-efficacy face compounded challenges unless strong facilitating conditions are in place. Conversely, while high self-efficacy can sometimes compensate for limited resources, this is only effective if students are supported by a nurturing institutional ecosystem.

This demonstrated the importance of comprehensive educational planning. Addressing only one factor, such as providing laptops without considering students' psychological readiness or the support of their environment, may result in limited benefits. Digital arts education must be systematically designed, requiring coordinated efforts across teaching, infrastructure, student services, and financial aid. Learning is not solely determined by individual ability, but it is also influenced by the environment in which that ability is utilised.

7. Contributions, Implications and Limitations

This study offered significant contributions to theory, practice, and methodology. This research enhanced our understanding of how computer self-efficacy affects students' motivation, engagement, and creative performance in digital arts. It addressed a gap in the existing literature, where creative performance has received limited attention. The study emphasised the impact of socio-economic factors – not only on access to digital resources but also on creative output, providing a fresh perspective on how financial disparities affect academic performance. Furthermore, the study expanded on the concept of facilitating conditions by demonstrating how support systems in educational institutions improve learning experiences and academic success. This offered new insights for future research in digital arts education.

The practical implications of this study are important for educators, administrators, and policymakers. By enhancing computer self-efficacy, institutions can increase students' motivation, engagement, and creative output. Students' creative confidence can be strengthened by providing access to advanced tools, personalised technical support, and platforms to showcase their work. Addressing socio-economic disparities through grants, scholarships, and access to essential digital arts tools can help close the creative output gap created by financial inequality. Institutions should improve facilitating conditions by providing the latest software, design studios, and technical assistance, thereby creating an environment that encourages creativity and academic success. These measures will equip students with the skills and resources they need to succeed in digital arts programmes.

Despite these contributions, the study did have limitations. The sample size was relatively small, which could affect the generalisability of the findings. Future research should include a more diverse sample from various institutions and regions to offer broader insights. While this study focused on self-efficacy, socio-economic factors, and facilitating conditions, it overlooked other important variables such as cultural orientation, creative habits, and personal interests. Future research should investigate these factors to gain a more comprehensive understanding of student motivation and creative performance. Lastly, relying on self-reported data creates the potential for social desirability bias. Incorporating objective measures of creative output, such as expert evaluations or standardised creative performance rubrics, would strengthen the reliability of future research. However, these limitations do not undermine the findings of this study.

8. Conclusion

This study examined how computer self-efficacy, socio-economic factors, and facilitating conditions affect the academic learning needs of digital arts students, while emphasising their motivation, engagement, and creative performance in technology-enhanced learning environments. The findings indicated that the factors are closely interconnected in shaping digital learning experiences. Computer self-efficacy significantly predicts academic confidence and digital engagement. This highlighted the importance of digital arts programmes prioritising skill-based interventions that boost students' confidence in using technology. Institutional policies should include workshops, peer mentoring, and

digital literacy training to improve students' technological self-concepts and independent learning. Socio-economic disparities affect access to digital resources and overall academic performance. Disadvantaged students reported less access to essential tools, which limits their creative expression and productivity. This finding highlighted the urgent need for inclusive funding models, subsidised digital tools, and expanded access to university-owned creative infrastructure.

Bridging the digital divide involves allocating resources and ensuring educational equity, as digital exclusion affects academic engagement. Facilitating conditions were found to be instrumental in meeting academic needs. Institutions should develop robust support systems with technical assistance, well-equipped studios, updated software licences, and collaborative digital exploration spaces. These investments build creative confidence and promote sustained engagement and retention in digital arts programmes. Overall, these findings have important implications for both teaching methods and organisational structure. Educators should adopt learner-centred strategies that consider students' diverse levels of technological competence.

Institutional leaders need to address systemic inequities that hinder access to digital resources to create a more inclusive, motivating, and creatively enriching learning environment that supports the holistic development of digital arts students. Future research should adopt longitudinal approaches and incorporate various institutional contexts to expand on this study's insights and facilitate the broader transformation of digital arts education.

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