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Journal of Counseling and Educational Research

ISSN 3063-9786 (Electronic)
Editor: Yuda Syahputra

Publication details, including author guidelines
URL: https://journal.aapbk.org/index.php/jcerch/about/submissions#authorGuidelines

Digital Instructions and Self-Directed Learning as Determinants of Academic Performance Amongst Higher Education Institutions' Students (Heis)

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Article History
Received : 29 March 2025
Revised : 22 April 2025
Accepted : 23 April 2025

How to cite this article (APA 6th)
Eluemuno, A. I., Nwikpo, M. N., & Ipem, J. N. (2025). Digital Instructions and Self-Directed Learning as Determinants of Academic Performance Amongst Higher Education Institutions' Students (Heis). *Journal of Counseling and Educational Research*, 1(3), 123–135. https://doi.org/10.63203/jcerch.v1i3.172

The readers can link to article via https://doi.org/10.63203/jcerch.v1i3.172

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Journal of Counseling and Educational Research (2025), 1(3), 123-135
ISSN 3063-9786 (Electronic)
https://doi.org/10.63203/jcerch.v1i3.172

Original Article

Digital Instructions and Self-Directed Learning as Determinants of Academic Performance Amongst Higher Education Institutions' Students (Heis)

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Abstract. The rapid digitalization of education has transformed instructional methodologies in higher education institutions (HEIs). This paper explores the role of digital instruction and self-directed learning (SDL) as key determinants of academic performance. While digital instruction offers flexibility and accessibility, SDL empowers students to take ownership of their learning. The interplay between these factors significantly influences academic success. The population of study covered all the students of the government owned tertiary institutions in the six geopolitical zones used for the study. The study adopted the correlational survey design and utilized purposive sampling technique to select 185 students from the institutions. The instruments used for the study was developed by the researchers, titled Digital Instructions and Self-directed Learning as determinants of academic performance amongst Higher Education Institutions' Students (HEIs) Questionnaire (DIaSLdAHEIsQ). The instrument was validated by experts in measurement and evaluation department to ensure content validity. The reliability of 0.88 at Cronbach alpha using test-retest method, there after Pearson Product Moment Correlation (PPMC) was used. Two (2) research questions were raised to guide this study and they were answered using the PPMC. The findings of the study revealed that digital instructions significantly correlate with academic performance of students in HEI (r = .244**, N= 185, P < .05), and also that digital instructions positively correlate with self – directed learning amongst students in HEI (r = .337***, N= 185, P < .05) at 0.05 level of significance. Based on the findings the following recommendations were made, that articulate use of digital resources ought to be underpinned by deployment of meaningful instructional materials and digital tools and activities. Teachers' professional competence on the use of digital resources.

Keywords: Digital Instructions, Self–Directed Learning, Digital Resources, Academic Performance.

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Introduction

Higher education institutions are experiencing an educational paradigm shift fueled by technological advancements and evolving pedagogical approaches. Traditional face-to-face learning is increasingly supplemented or replaced by digital instructional methods, including online lectures, blended learning, and interactive digital resources. Additionally, SDL is

becoming a vital competency for students navigating digital learning environments. This article examines how digital instruction and SDL impact students' academic performance, the challenges involved, and recommendations for optimizing digital learning strategies.

Digital Learning can be conceived as a science of technology and method by which educational goals can be realized in a simple way, it is a science on the basis of which various strategies and tactics could be designed for the realization of specific goals. The use of digital resources in teaching and learning can make the classroom more conducive for learning. Digital resources can promote learner independence by allowing learners to learn from sources other than the teacher. Digital resources also allow for flexibility, which means that learners can access learning material and information anywhere. It could also be helpful in education innovation by considering new system and material along with inventing instrument, finding procedure and then thinking proper solution to overcome educational challenges. Eluemuno et. al (2024), posits that Information Communication Technology (ICT) is seen as important paraphernalia of teaching and learning activities, it plays a significant role in improving knowledge and skills of teachers and students apart from preparing them for the life through education and training.

Digital instruction refers to the use of digital tools, online platforms, and virtual resources to facilitate learning. Universities worldwide have adopted Learning Management Systems (LMS) such as Moodle, Blackboard, and Canvas to streamline course delivery. A study by Hodges et al. (2020) highlights that digital instruction enhances engagement and personalized learning, allowing students to access learning materials anytime and anywhere. Furthermore, the COVID-19 pandemic accelerated the adoption of digital learning, making it a necessity rather than a supplementary tool. According to a report by UNESCO (2024), over 80% of HEIs worldwide have integrated digital instruction into their curricula. However, the transition has not been without challenges, including technological disparities, lack of digital literacy, and reduced student-instructor interactions.

Since the emergence of the first technologies in the 80's, such as videos and computers, the aim of using these resources, as of how they can help learning within the educational sphere, has been a subject of study. This involved a stream of research that has focused on the use of digital resources for teaching students, with examples on the use of videos (e.g., Zhang et al., 2006) and the implementation of digital resources for computers in classrooms (Santiago et al., 2009; Lopez-Rosenfeld et al., 2013; Goldin et al., 2014). Today, with the increase in the number and use of electronic devices (computers, smartphones, and tablets), the market for digital educational material is constantly growing (Blumberg and Fisch, 2013; Hirsh-Pasek et al., 2015). This growth has led to a greater use of technologies in the classroom (Lieberman et al., 2009). Nevertheless, researchers and professionals within the educational field are still seeking to understand how this material helps students to learn. Classroom resources involving digital material could help students in terms of motivation and their attention span, and as a means for galvanizing them toward specific learning goals (Arnab et al., 2012; Hirsh-Pasek et al., 2015).

Exposure to digital environments plays a decisive role in being able to develop digital literacy. For example, it is easier to achieve a high level of digital literacy if one has access to the Internet at home than if one has to go to an Internet cafe (Yustika and Iswati, 2020). Such accessibility varies across different socioeconomic groups and in different parts of the world (Creighton, 2018).

Self-directed learning (SDL) is a tool that teachers can use to encourage their students to learn independently in and outside of the classroom. Instead of creating a strict teaching plan, teachers can allow their students to take responsibility for their learning by making goals, improving their skills and making decisions on what, where, when and how they learn. SDL allows students to learn with autonomy, developing essential skills valuable for revision and study as they grow older. SDL is a valuable skill for children and adults. Self-directed learning, also known as student-directed learning, is an educational theory or method of content delivery in which the student takes control of their own education. Through the use of self-directed

learning, students set their own goals and deadlines while following a broad assignment outcome. They participate in research relative to their own interests, while the teacher remains available for support if needed. SDL is a process in which students take initiative in diagnosing their learning needs, setting goals, identifying resources, and evaluating their progress. Knowles in Morris (2024) defines SDL as a learner-centered approach that fosters autonomy and intrinsic motivation. Research by Ajani & Maphalala (2023) suggests that students with high SDL capabilities perform better academically in digital learning environments compared to those who rely solely on instructor-led teaching. Studies also show that SDL promotes problem-solving skills, critical thinking, and adaptability—essential competencies in the 21st-century workforce. However, challenges such as lack of self-discipline, time management difficulties, and feelings of isolation can hinder SDL effectiveness.

Digital instructions are also associated with self-directed learning. This refers to students' ability to identify their own learning needs and to take responsibility for their own learning, for example, through study scheduling, source selection, and help seeking (Hung et al., 2010; Kara, 2022). Both digital instructions and self-directed learning are concerned with learners' characteristics and their levels of engagement. Higher levels of digital literacy and self-directed learning lead to higher levels of engagement, resulting in better academic achievement (Hwang and Oh, 2021; Kara, 2022). Both terms have a strong connection with self-efficacy. Self-efficacy refers to an individual's assessment of and belief in himself or herself to overcome obstacles and solve future problems. In other words, it concerns students' abilities to deal with situations that contain new and unpredictable elements (Hamann et al., 2021). Individuals with high self-efficacy are more persistent and fight to a greater extent to solve their problems. Self-efficacy also differs among individuals, and these differences can be derived from their upbringing or gender (Aslan, 2021). Differences in self-efficacy may also depend on how it is measured, as men and women fall out differently depending on the outcome measures used (Hamann et al., 2021).

Before a teacher implements self-directed learning processes into their classroom, they must first determine whether or not the learning atmosphere would be most beneficial through the employment of such methods. Teachers should assess the strengths, interests, and learning needs of their students, create unique and interesting lessons with specific learning outcomes, and remain present for counseling or guidance throughout the self-directed learning process. Additionally, teachers should ensure that students understand the importance of the learning outcomes, and encourage students to take responsibility for their own work.

In developed countries, for example, most universities are using technology to provide a more valuable learning experience to their students through their digital devices (Gould, 2012a). Online access to academic databases and research material is a natural part of most universities in developed countries. This is not the same reality in many universities in developing countries although university students also own at least one digital device (Snyder & Prinsloo, 2007). Many of the universities in the developing countries do not provide their students with the information seeking capabilities and reliable sources of information they need to effectively use digital information to improve their learning experiences.

Using technology to facilitate learning in Higher Education Institutions (HEIs) has become common practice due to its ability to reduce barriers related to time and space in traditional learning environments. However, current literature mostly focuses on the use of the technology and not on the use of the information it conveys. Also, very few studies focus on technology adoption in HEIs in developing countries, especially those in Africa. The number of online courses has been constantly increasing. Educators and course managers can implement several steps to overcome the obstacles associated with online learning, for example, by providing possibilities for socialization and interaction between students and between students and teachers (Salmon, 2013; Shen et al., 2013) or monitoring students' activities and encouraging struggling learners. This is especially important for less experienced online students (Shen et al., 2013).

https://doi.org/10.63203/jcerch.v1i3.172

Even though it is a popular topic of discussion, there is limited empirical evidence to support the factors that influence the use of digital information by millennial students in HEI given that most studies focus on the technology itself (Pinho et al., 2018). For example, undergraduate students in Australia show that technology is an essential element of learning in contemporary universities. Students tend to engage more in learning practices when they use their own devices like laptops and phones and ipads.

Assessment methods in higher education encompass a wide range of approaches, each with its own strengths and limitations (Braun, 2019). Old methods such as examinations, essays, and projects are commonly used to appraise students' knowledge and understanding of the subject matter. Assessments should also be all-encompassing and reflect students' diversity. Examinations provide a homogeneous arrangement for evaluating factual knowledge, abstract understanding, and problem-solving capabilities within a given timeframe. Standardization is an important factor for enabling comparisons between students, different course iterations, and different institutions (Braun, 2019).

Digital instructions play a significant role in addressing assessment challenges. Online assessments, computer-based simulations, and automated grading systems offer scalability, efficiency, and opportunities for personalized feedback. However, it comes with challenges, and the need for adequate training and support for both students and instructors should be carefully addressed (Paul and Jefferson, 2019). However, the level of digital instructions and learning comes into play. A low level of digital instructions and learning can have a negative impact on students' academic performance simply because examinations take place via digital channels, as is prevalent in online courses. Technology can play a significant role in addressing assessment challenges. Online assessments, computer-based simulations, and automated grading systems offer scalability, efficiency, and opportunities for personalized feedback. However, it comes with challenges, and the need for adequate training and support for both students and instructors should be carefully addressed (Paul and Jefferson, 2019). In this context, the level of digital literacy comes into play. A low level of digital literacy can have a negative impact on students' academic achievement simply because examinations take place via digital channels, as is prevalent in online courses.

Holm, (2024) posits that assessing academic achievement in higher education poses several challenges that must be addressed to ensure a fair and accurate evaluation. One challenge lies in assessing complex skills and competencies. Many disciplines require students to develop higher-order thinking skills, such as problem-solving, critical analysis, and creativity. Designing assessment tasks that effectively measure these skills can be challenging because they often involve open-ended problems or real-world scenarios. Innovative assessment methods such as case studies, simulations, and authentic assessments offer potential solutions by providing opportunities for students to apply their skills in contextually rich and realistic situations.

Kebritchi ,(2017), study on Issues and Challenges for Teaching Successful Online Courses in Higher Education: A literature review focused on how the society is changing by Artificial Intelligence, Information Technology and all sorts of technological development. Last Decade saw a rapid increase in Internet services via efforts of the government of India and telecom operators. This has also changed the way of learning and teaching and has created many new opportunities as well as challenges. This has also changed the way of learning and teaching and has created many new opportunities as well as challenges. Challenges from Online learning are as follows

- Insufficient digital infrastructure – in India, the majority is rural population still struggling for problems like Power Supply and Network issues which is standing like a huge hindrance in growing digital infrastructure.
- Limited Social interaction – Online learning cuts the social communication between the people as Artificial Intelligence is making people more and more dependent on technology.
- Questionable credibility of degrees – The Degrees provided after online learning are often questioned because the credibility of them cannot be verified easily.

● Motivation – Online courses need motivation and dedication to learn something new. In lack of above factors online education is not possible and loses its credibility.

Salamat L at. el. (2018), studied the effects of E-learning on students' Academic Learning at University Level in which the data was analyzed and used the statistical techniques of frequency and percentage score. The study found that e-learning provides time flexibility to the students and it motivates students to do their own work without others' help. It was also that students feel comfortable when they use the internet. The study concluded that eLearning is a system that provides time flexibility to the students for their learning and motivates students to do their work without others' help. It is also concluded that students feel comfort in browsing and surfing the internet.

Communication and collaboration is a key aspect of digital instructions. It can be particularly difficult in an online course, where it is more difficult to achieve spontaneous meetings between teachers and students and between the students themselves. The constructivist theory asserts that learning is a socially interactive activity and that it is best performed within the learner's zone of proximal development (ZPD) (Vygotsky, 1978). ZPD is defined as "the distance between the actual level of development determined by independent problem solving and the level of potential development determined by problem solving under adult guidance or in collaboration with more capable peers" (Vygotsky, 1978). This means that students are encouraged to learn with others outside their knowledge zones. Therefore, teachers should provide the possibility for communication between students, thereby facilitating knowledge exchange where students can learn from each other. Students with a higher level of communication and collaboration and, thus, a higher degree of digital literacy can succeed in their online studies.

Ramaila & Mpinga (2022), in their study posits that digital resources can be used in science classrooms to enhance learner engagement and motivation. Digital resources include interactive game-based applications that can be used in online learning environments. This study examined the effect of digital learning on the academic achievement and motivation of grade 9 Natural Sciences learners in a South African independent school. The empirical investigation adopted a mixed method approach as part of a quasi-experimental design. A questionnaire based on the Skeletal System and a motivation questionnaire were administered as pre-tests and post-tests to establish the effectiveness of the use of digital resources as an instructional intervention on the academic achievement and motivation of grade 9 Natural Sciences learners. The empirical investigation is underpinned by the Cultural Historical Activity Theory as the underlying theoretical framework. Key findings revealed significant difference between the pre-test and post-test scores as a result of the use of digital resources as an instructional intervention. Theoretical implications for technology-enhanced teaching and learning are discussed.

Digital instruction and SDL are interconnected, with technology serving as a catalyst for self-directed learning. A study conducted by El Gharbaoui & Alami (2024) involving 1,200 university students found that: Students who effectively utilize digital learning tools demonstrate higher engagement and improved academic performance. The use of digital platforms enhances SDL by providing interactive, student-centered learning experiences. Lack of proper SDL skills can result in digital distractions, procrastination, and lower academic outcomes.

Further research by Sun et al. (2017) indicates that digital instruction alone does not guarantee improved academic performance. Instead, when combined with effective SDL strategies, students achieve significantly better outcomes. This reinforces the importance of integrating SDL skill development into digital learning frameworks.

One of the purposes of Doherty's (2000) study was to find the existence of a relationship between self-directed learning and academic performance as defined by a final course grade. The study subjects were the college students who enrolled in on-line courses delivered by a web learning platform called Washington ONLINE. After distributing SDLRS to all on-line learners via e-mail, Doherty only collected 147 valid questionnaires (the course name and content was

https://doi.org/10.63203/jcerch.v1i3.172

not reported). The result of the study showed that self-directed learning did not relate to academic performance. In this case, according to Doherty, the final course grades of sample subjects were positively skewed. The reason is unknown. A notable point is that Doherty attributed the failure between self-directed learning and academic performance to the lack of reliability and validity of the SDLRS among the subject population.

Statement of Problem

The increasing reliance on digital instruction in higher education institutions (HEIs) has transformed the traditional learning environment. While digital platforms offer flexibility, accessibility, and innovative pedagogical approaches, their effectiveness in enhancing academic performance remains a subject of debate. Additionally, the shift toward self-directed learning (SDL) requires students to develop independent learning skills, time management strategies, and self-motivation, yet not all students possess these capabilities.

Despite the growing integration of technology in education, challenges such as digital literacy gaps, the digital divide, cognitive overload, and reduced student engagement persist. Many HEIs lack structured approaches to cultivate SDL competencies among students, resulting in varied academic outcomes. Moreover, while some studies suggest a positive correlation between digital instruction, SDL, and academic success, others indicate that without proper guidance and support, students may struggle to achieve their learning objectives.

This study seeks to investigate the impact of digital instruction and SDL on students' academic performance, identify the challenges associated with these learning approaches, and propose strategies for optimizing their effectiveness in HEIs.

Purpose of Study

1. To ascertain if a significant relationship exists between digital instructions and academic performance amongst HEIs students.
2. To find out if a significant relationship exists between digital instructions and self – directed learning amongst HEIs students.
3. To find out if a significant relationship exists between self-directed learning and academic performance.

Research Questions

1. What significant relationship exists between digital instructions and academic performance amongst HEIs students?
2. What significant relationship exists between digital instructions and self – directed learning amongst HEIs students.
3. What significant relationship exists between self-directed learning and academic performance?

Methodology

The study adopted a correlation study design. Correlational research design measures the magnitude and direction of the relationship between two or more variables, revealing their

associations. At the onset, created initial equivalence between the groups or variables being compared, it is essential in descriptive correlational research. The study utilized purposive sampling technique to select 185 students from the six universities randomly selected from the eastern and western Nigeria, with a population of over 60, 000 students. In purposive sampling, you set out to identify members of the population who are likely to possess certain characteristics or experiences (and to be willing to share them with you). In this way, you can select the individuals or cases that fit your study, focusing on a relatively small sample. The instruments used for the study were questionnaires structured by the researchers titled Digital Instructions and Self-directed Learning as determinants of academic performance amongst Higher Education Institutions' Students (HEIs) Questionnaire (DIaSLdAHEIsQ). The questionnaire was structured in two parts: the first part comprised of the students' biometrics and the second part comprised of items bordering on digital instructions, self – directed learning and academic performance. The instrument was validated by two experts in measurement and evaluation. To test the reliability of the instrument, test re-test method of an interval of two weeks was used on students from two tertiary institutions that did not participate in the real study. The two scores obtained from the two tests were correlated using Pearson's Product Moment Correlation (PPMC) Statistics and a reliability index of 0.88 was obtained.

The researchers obtained the consent of the participants and having sought and obtained the consent of the participants, the researchers personally administered copies of the instruments with some explanation on how to complete them and the purpose of the research to the participants.

Data Analysis

Data were analyzed with Pearson Product Moment Correlation and multiple regression statistical tools at 0.05 level of significance.

Results

Research Question 1: What significant relationship exists between digital instructions and academic performance amongst HEIs students?

Table 1: PPMC summary table showing significant relationship between digital instructions and academic performance of HEIs students in Nigeria.

Variable	Mean	Std. Dev.	N	R	P	Remark
Digital Instructions	7.1946	1.5931				
Academic performance	8.0832	2.3027	185	.244**	.000	Sig.

** 0.05 Level of Sig.

The result in table 1 reveals that digital instructions significantly correlates positively with academic performance of students (r = .244**, N= 185, P < .05).

Research Question 2: What significant relationship exists between digital instructions and self – directed learning amongst HEIs students.

https://doi.org/10.63203/jcerch.v1i3.172

Table 2: PPMC summary table showing significant relationship between digital instruction and self – directed learning of HEIs students in Nigeria.

Variable	Mean	Std. Dev.	N	R	P	Remark
Digital instructions	7.1946	1.5931				
Self – directed learning	11.8486	4.3114	185	.337***	.000	Sig

** 0.05 Level of Sig.

The result in table 2 reveals that digital instructions positively and significantly correlates with self-directed learning (r = .337***, N= 185, P < .05).

Research Question 3: What significant relationship exists between self-directed learning and academic performance among HEIs students?

Table 3: PPMC summary table showing significant relationship between and self – directed learning and academic performance of HEIs students in Nigeria.

Variable	Mean	Std. Dev.	N	R	P	Remarks
Self-Directed Learning	11.85	4.31	185			
Academic Performance	3.38	0.47	185	.421***	.000	Sig.

** 0.05 Level of Sig.

Note. ***p < .001** (2-tailed)
r = .421 indicates a **moderate positive correlation**

The result in table 3 revealed a statistically significant, moderate positive correlation between the two variables, **r = .421, p < .001**. This suggests that students with higher levels of self-directed learning tend to achieve better academic outcomes.

Discussion

Digital learning is becoming increasingly important in an increasingly digitalized world. This applies to the educational system as well. Students must learn to use digital resources in their studies in a way that helps them, without being overwhelmed by all the digital tools and excessive information available on the internet. This study aimed to investigate if digital learning and self – directed learning would influence the academic performance of students in the higher education institutions (HEI). The research questions guiding this study addressed how digital learning and its different aspects affect and are affected by academic performance and also whether this digital learning affects self-directed learning performance of students.

The findings reveal that digital instructions significantly and positively influences academic performance of HEIs (r = .244**, N= 185, P < .05), since it includes social aspects and activities such as interactions and collaboration through a variety of digital technologies to share data and information with others. The use of digital resources brought about transformed learner experiences which culminated in enhanced academic achievement and motivation.

As learning is considered as a social process, based on the constructivist theory (Vygotsky, 1978), it is not difficult to see that a student who reaches a higher level within this area will succeed better in their studies by both giving and receiving help from others via digital tools. This area also includes dealing with digital identities, adapting communication to a specific audience, and increasing awareness of cultural and generational diversity in digital environments (Vuorikari et al., 2022). This supports White and Le Cornu's (2011) theory of

digital visitors and residents with its tool, place, and space metaphors instead of Prensky's (2001) language and age metaphor of digital natives and immigrants. This finding also supports Salamat L at. el. (2018), in their study found that e-learning provides time flexibility to the students and it motivates students to do their own work without others' help. It was also that students feel comfortable when they use the internet. The study concluded that eLearning is a system that provides time flexibility to the students for their learning and motivates students to do their work without others' help. It is also concluded that students feel comfort in browsing and surfing the internet.

This finding disagrees with Kebritchi, (2017), who only highlighted various challenges posed by the use of digital instructions such as insufficient infrastructure, limited interactions and motivation. He therefore concluded that due to the lack of above factors online education is not possible and loses its credibility.

The study also found that a positive correlation occurred between digital instructions and self – directed learning. Most of the time self – directed learning only happens where there is digital instructions. Higher levels of digital literacy and self-directed learning lead to higher levels of engagement, resulting in better academic achievement (Hwang and Oh, 2021; Kara, 2022). This agrees with studies have shown that digital literacy positively affects self-directed learning, which in turn positively affects academic achievement (Rini et al., 2022; Wang et al., 2021). Though there are challenges which could come with digital instructions which include Internet connectivity which is a key requirement for effective use of digital tools in digital instructions learning environments. Prolonged use of digital resources may potentially lead to addiction on the part of students.

The findings of this study indicate that self-directed learning (SDL) is positively associated with academic performance, supporting the notion that learners who take initiative, set goals, and reflect on their learning are more likely to succeed academically. The moderate correlation value (**r = .421**) aligns with previous studies showing that self-regulation and learner autonomy contribute significantly to educational achievement (Cazan & Schiopca, 2014; Mahmoodi, Kalantari, & Ghaslani, 2014).

This result also supports Knowles' (1975) theory of andragogy, which emphasizes the importance of self-directed learning, particularly among adult learners. In higher education settings, students with well-developed SDL skills are more capable of managing academic demands, engaging deeply with course content, and adapting to various learning environments—including digital and blended formats (Song & Hill, 2007).

Conclusion

E-learning (or Web-based learning) is growing at an exponentially rapid rate around the world. Once the factors affecting successful e-learning are found, empirically, researchers and instructors must be able to find feasible instructional strategies to deal with these aspects, such as using online activities to enhance self-directed learning. In the long run, the costs of e-learning will decrease and learning outcomes will increase.

There are several definitions of self-directed learning, but they generally refer to students' ability to take responsibility for their own learning of a certain body of knowledge, where different learning activities, evaluations, and social skills are considered (Loeng, 2020). This can occur both within and outside formal educational institutions. There is evidence that students take the initiative to learn, learn more and learn better than those who passively allow themselves to be taught. A higher degree of self-direction has also been shown to give students a sense of success compared to students with a lower level of self-direction (Loeng, 2020). Access to bandwidth remains a key challenge afflicting coherent use of digital resources in online learning environments. Inadequate internet access has been identified as one of the major barriers to successful integration of digital resources in teaching and learning (Ghavifer,

https://doi.org/10.63203/jcerch.v1i3.172

Kunjappan & Rasamany (2016). Therefore Government should ensure that there is adequate provision of digital instructional materials and tools in the various HEI and the teachers should be adequately and effectively trained in the use of these resources.

While the correlation is significant, it is important to acknowledge that correlation does not imply causation. Academic performance is influenced by multiple factors, including motivation, prior knowledge, socioeconomic background, and learning environment. Further research, including longitudinal or experimental designs, is recommended to explore causal relationships.

Recommendations

Based on the findings of this study, and to maximize the effectiveness of digital instruction and SDL, HEIs and other stakeholders should consider the following recommendations:

1. Promote Digital Literacy: Implement training programs to help students develop digital navigation skills and responsible technology use.
2. Incorporate SDL Training: Embed self-regulation strategies within curricula to equip students with effective study habits and time management skills.
3. Enhance Student Support Services: Provide online tutoring, mentorship programs, and peer collaboration opportunities to support digital learners.
4. Leverage Adaptive Learning Technologies: Utilize AI-driven platforms that personalize learning experiences based on student progress and needs.
5. Educators and curriculum designers should consider integrating self-directed learning strategies such as goal-setting activities, reflective journals, learning contracts, and flexible pacing tools. These can encourage greater learner autonomy and potentially improve academic outcomes.
6. Ensure Equitable Access: Governments and institutions should invest in digital infrastructure to bridge the digital divide among students.

References

Aslan S (2021) Analysis of digital literacy self-efficacy levels of pre-service teachers. *International Journal of Technology in Education* 4(1): 57–67.

Arnab, S., Lim, T., Carvalho, M. B., Bellotti, F., De Freitas, S., Louchart, S., et al. (2015). Mapping learning and game mechanics for serious games analysis. *Br. J. Educ. Technol.* 46, 391–411. doi: 10.1111/bjet.12113

Blumberg, F. C., and Fisch, S. M. (2013). "Introduction: digital games as a context for cognitive development, learning, and developmental research," in *Digital Games: A Context for Cognitive Development. New Directions for Child and Adolescent Development*, eds F. C. Blumberg and S. M. Fisch (Hoboken, NJ: John Wiley & Sons), 1–9.

Braun H (2019) Performance assessment and standardization in higher education: a problematic conjunction? *British Journal of Educational Psychology* 89(3): 429–440.

Cazan, A. M., & Schiopca, B. A. (2014). Self-directed learning, personality traits and academic achievement. *Procedia - Social and Behavioral Sciences, 127*, 640–644. https://doi.org/10.1016/j.sbspro.2014.03.327

Darmayanti, T. (1994). *Readiness for self-directed learning and achievement of the students of Universitas Terbuka (The Indonesian Open Learning University)*. Unpublished master thesis. The University of Victoria, British Columbia, Canada.

Doherty, P. B. (2000). *Success factors among community college students in an online learning environment*. Unpublished doctoral dissertation. The Nova Southeastern University, Fort Lauderdale- Davie, FL.

El Gharbaoui, A., & Alami, H. (2024). The Influence of Social Media on the Consumer Decision-Making Process and Preferences in the Digital Era. *Книга*, *25*.

Eluemuno, A.I, Nwikpo,M.N, Eluchie, O. J, Onah, T.A, Nbisike,G.O, & Nwaji, L. (2024). Information and communication technology and emotional Intelligence as correlates of academic performance among in–school adolescents in Owerri Municipal, Imo state. *International Journal of Multidisciplinary and current educational research (IJMCER)*. 6(2), 288 – 295.

Guglielmino, L. M., & Guglielmino, P. J. (2003b). Identifying learners who are ready for e-learning and supporting their success. In G. M. Piskurich (Ed.), *Preparing learners for e-learning* (pp.18-33). San Francisco, CA: Jossey-Bass.

Ghavifekr, S., Kunjappan, T., & Rasamany, L. (2016). Teaching and learning with ICT tools: Issues and challenges from teachers' perceptions. *Malaysian Online Journal of Educational Technology*, *4*(2), 38-57.

Gould, R. (2012a). ECAR Study of Undergraduate Students and Information Technology 2013. *In C2C Digital Magazine* (Vol. 1). 2018.

Goldin, A. P., Hermida, M. J., Shalom, D. E., Elias Costa, M., Lopez-Rosenfeld, M., Segretin, M. S., ... & Sigman, M. (2014). Far transfer to language and math of a short software-based gaming intervention. *Proceedings of the National Academy of Sciences*, *111*(17), 6443-6448.

Hamann K, Pilotti MAE and Wilson BM (2021) What lies beneath: the role of self-efficacy, causal attribution habits, and gender in accounting for the success of college students. *Education Sciences* 11(7): 333.

Hirsh-Pasek, K., Zosh, J. M., Golinkoff, R. M., Gray, J. H., Robb, M. B., & Kaufman, J. (2015). Putting education in "educational" apps: Lessons from the science of learning. *Psychological science in the public interest*, *16*(1), 3-34.

Hodges, C. B., Moore, S., Lockee, B. B., Trust, T., & Bond, M. A. (2020). The difference between emergency remote teaching and online learning. *Educause*. https://er.educause.edu/articles/2020/3/the-difference-between-emergency-remote-teaching-and-online-learning

Hsu, Y. C., & Shiue, Y. M. (2005). The effect of self-directed learning readiness on achievement comparing face-to-face and two-way distance learning instruction. *International Journal of Instructional Media*, 32 (2), 143-155.

Hung M-L, Chou C, Chen C-H, et al. (2010) Learner readiness for online learning: scale development and student perceptions. *Computers & Education* 55(3): 1080–1090.

Hwang Y and Oh J (2021) The relationship between self-directed learning and problem-solving ability: the mediating role of academic self-efficacy and self-regulated learning among nursing students. *International Journal of Environmental Research and Public Health* 18(4): 1738.

Kara M (2022) Revisiting online learner engagement: exploring the role of learner characteristics in an emergency period. *Journal of Research on Technology in Education* 54(sup1): S236–S252.

C. Pinho *et al.* (2018). Web portals as tools to support information management in higher education institutions: A systematic literature review *International Journal of Information Management*

Kebritchi M 2017, studied on Issues and Challenges for Teaching Successful Online Courses in Higher Education: A literature review *Journal of Educational Technology Systems* Vol 46 (I) DOI: 10.1177/0047239516661713.

Knowles, M. S. (1975). *Self-directed learning: A guide for learners and teachers*. Follett Publishing Company.

Le Cornu, A. (2011). Visitors and Residents: A new typology for online engagement. *First monday*.

https://doi.org/10.63203/jcerch.v1i3.172

Lieberman, D. A., Bates, C. H., and So, J. (2009). Young children's learning with digital media. *Computer. Sch.* 26, 271–283. doi: 10.1080/07380560903360194

Loeng S (2020) Self-directed learning: a core concept in adult education. *Educational Research International* 2020: 1–12.

Long, H. B. (1991). College students' self-directed learning readiness and educational achievement. In H. B. Long & Associates (Eds.), *Self-directed learning: Consensus and conflict* (pp. 107-122). Oklahoma, OK: Oklahoma Research Center for Continuing Professional and Higher Education of the University of Oklahoma.

Lopez-Rosenfeld, M., Goldin, A. P., Lipina, S., Sigman, M., & Slezak, D. F. (2013). Mate Marote: A flexible automated framework for large-scale educational interventions. *Computers & Education*, *68*, 307-313.

Mahmoodi, M. H., Kalantari, B., & Ghaslani, R. (2014). Self-regulation, motivation, and language achievement. *International Journal of Language Learning and Applied Linguistics World, 7*(1), 117–127.

Maphalala, M. C., & Ajani, O. A. (2023). The COVID-19 pandemic: Shifting from conventional classroom learning to online learning in South Africa's higher education. International Journal of Innovative Technologies in Social Science, (2 (38).

Morris, T. H. (2024). Four dimensions of self-directed learning: A fundamental meta-competence in a changing world. *Adult Education Quarterly*, *74*(3), 236-254.

Paul J and Jefferson F (2019) A comparative analysis of student performance in an online vs. face-to-face environmental science course from 2009 to 2016. *Frontiers of Computer Science* 1: 7.

Pate, S. R. (2019). Project: Effect of digital learning on academic achievement of secondary school students. Project: Effect of Digital Learning on Secondary School Students

Prensky M (2001) Digital natives, digital immigrants part 1. *On the Horizon* 9(5): 1–6.

Ramaila, S & Mpinga, N. P. (2022).The Effect of Digital Learning on the Academic Achievement and Motivation of Natural Sciences Learners: A Case Study of a South African Independent School. *International Journal of Higher Education* 11, (7), 71 – 78. doi:10.5430/ijhe.v11n7p71

Ransome E. B., Jean R. & Kala K.(2020). The role of digital information use on student performance and collaboration in marginal universities, *International Journal of Information Management*, https://doi.org/10.1016/j.ijinfomgt.2020.102179 .

Rini R, Mujiyati M, & Sukamto I. (2022). The effect of self-directed learning on students' digital literacy levels in online learning. *International Journal of Instruction* 15(3): 329

Santiago, K., Lukas, J. F., Etxeberria, J., and Gobantes, A. (2009). *Evaluation of the IKASYS programme. Research, Reflections and Innovations in Integrating ICT in Education.* Badajoz: FORMATEX, 51–54.344.

Salmon G (2013). *E-Tivities: The Key to Active Online Learning.* London, UK: Routledge.

Shen D, Cho M-H, Tsai C-L, et al. (2013) Unpacking online learning experiences: online learning self-efficacy and learning satisfaction. *The Internet and Higher Education* 19: 10–17

Snyder, I., & Prinsloo, M. (2007). Young people's engagement with digital literacies in marginal contexts in a globalized world. *Language and Education*, 21(3), 171–179. https://doi.org/10.2167/le745.0

Song, L., & Hill, J. R. (2007). A conceptual model for understanding self-directed learning in online environments. *Journal of Interactive Online Learning*, *6*(1), 27–42.

Sun-Lin, H. Z., & Chiou, G. F. (2017). Effects of self-explanation and game-reward on sixth graders' Algebra variable learning. *Educational Technology & Society*, *20*(4), 126–137. https://www.jstor.org/stable/26229211. Accessed 11-02-2024.

UNESCO. (2024). "Global Trends in Digital Education." UNESCO Education Report

Urquhart, C., Thomas, R., Spink, S., Fenton, R., Yeoman, A., Lonsdale, R., Rowley, J. (2005). Student use of electronic information services in further education. *International*

Journal of Information Management, 25(4), 347–362. https://doi.org/10.1016/j.ijinfomgt.2005.04.006

Vuorikari R, Kluzer S and Punie Y (2022) DigComp 2.2: The Digital Competence Framework for Citizens. Luxembourg, UK: Publications Office of the European Union.

Vygotsky L (1978). *Mind in society. In: The Development of Higher Psychological Processes*. Cambridge, MA and London, UK: Harvard University Press.

Wang Q, Xiong C & Liu J (2021). Does culture or self-directed learning drive online performance? *International Journal of Educational Management* 35(6): 1077–1098.

White DS & Le Cornu A (2011) Visitors and residents: a new typology for online engagement. *First Monday* 16(9): DOI: 10.5210/fm.v16i9.3171.

Yustika GP & Iswati S (2020) Digital literacy in formal online education: a short review. *Dinamika Pendidikan* 15(1): 66–76.

Zhang, D., Zhou, L., Briggs, R. O., and Nunamaker, J. F. Jr. (2006). Instructional video in e-learning: assessing the impact of interactive video on learning effectiveness. *Inform. Manag.* 43, 15–27. doi: 10.1016/j.im.2005.01.004