A Conceptual Model for Promoting Self-Directed Learning in Online Learning Environment

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ABSTRACT: It is important in educational research to identify the key factors affecting self-directed learning when using Moodle as an online Learning Management system. The aim of this study is therefore to develop a research-based conceptual framework for understanding SDL in Moodle online learning contexts. To establish a robust foundation for the conceptual model, a comprehensive literature review was conducted. This review employed a multi-pronged approach, using broad keyword searches across academic databases like ERIC, JSTOR, and Google Scholar. The criteria used for selecting literature included relevance, credibility, and currency. This conceptual framework contributes significantly to both theory and practice of online learning that promotes self-directed learning. The framework may be used in developing instruments for promoting online self-directed learning. The developed conceptual framework could benefit all who are involved in supporting quality online education, in an effort to develop and impactful online practice that aligns with the corresponding educational needs, services, and resource.

Keywords: Conceptual framework, self-directed learning, Moodle, Learning Management system, online learning.

ABSTRAK: Penelitian pendidikan penting untuk mengidentifikasi faktor-faktor utama yang mempengaruhi pembelajaran mandiri (self-directed learning) dalam penggunaan Moodle sebagai sistem Manajemen Pembelajaran daring. Oleh karena itu, tujuan dari penelitian ini adalah untuk mengembangkan kerangka konseptual berbasis penelitian guna memahami pembelajaran mandiri dalam konteks pembelajaran daring Moodle. Untuk membangun landasan yang kuat bagi model konseptual ini, telah dilakukan tinjauan pustaka yang komprehensif. Tinjauan ini menggunakan pendekatan multiprong, dengan pencarian kata kunci yang luas di berbagai basis data akademik seperti ERIC, JSTOR, dan Google Scholar. Kriteria yang digunakan dalam pemilihan literatur mencakup relevansi, kredibilitas, dan kebaruan. Kerangka konseptual ini memberikan kontribusi yang signifikan terhadap teori dan praktik pembelajaran daring yang mendorong pembelajaran mandiri. Kerangka ini dapat digunakan dalam pengembangan instrumen untuk mendukung pembelajaran mandiri secara daring. Kerangka konseptual yang dikembangkan ini dapat memberikan manfaat bagi semua pihak yang terlibat dalam mendukung pendidikan daring berkualitas, sebagai upaya untuk mengembangkan praktik daring yang berdampak dan selaras dengan kebutuhan, layanan, serta sumber daya pendidikan yang sesuai.

Kata kunci: Kerangka konseptual, Moodle, sistem manajemen pembelajaran, pembelajaran daring, pembelajaran mandiri.

INTRODUCTION

Higher education institutions have been compelled to transition to online instruction due to the impact of the COVID-19 pandemic. This situation prompted a re-evaluation of curriculum delivery methods, leading to the comprehensive adoption of various Learning Management Systems (LMSs) for educational

activities. Notable examples of these LMSs include Moodle, Sakai, SumTotal, and Blackboard. Online learning requires students to be self-directed. The shift towards digital learning, accelerated by the pandemic, has made self-directed learning in Moodle not just beneficial, but essential for success in higher education. The traditional lecture-based model is increasingly supplemented, or even replaced, by online resources and activities, placing a greater onus on students to manage their own learning journey. Moodle provides a robust platform for this, offering opportunities for students to control the pace, content, and even the assessment methods they engage with. This autonomy allows for a more personalized learning experience, catering to individual learning styles and schedules, crucial in the increasingly flexible and asynchronous learning landscape of post-pandemic higher education. Furthermore, self-directed learning fostered through Moodle cultivates crucial skills like time management, resourcefulness, and metacognition – all highly sought after in today's professional environment, and increasingly valued by educators who understand the long-term needs of their graduates.

The shift to online learning, while offering flexibility and accessibility, has presented a unique set of challenges for students, educators, and institutions alike. One significant hurdle is the digital divide, where unequal access to reliable internet and appropriate devices creates significant disparities in learning opportunities. Furthermore, maintaining student engagement and motivation in a virtual environment can be incredibly difficult, often leading to feelings of isolation and a decline in participation. For educators, adapting teaching methodologies to a digital format requires substantial time, resources, and often a complete overhaul of their pedagogical approach. This can be compounded by the need to master new technologies and software. Finally, institutions face the challenge of ensuring academic integrity and providing adequate support services, such as technical assistance and counselling, in a remote setting. The transition to online learning is not simply a matter of replicating the classroom experience online, but rather a complex process requiring innovative solutions to these multifaceted challenges.

Moodle, a widely adopted open-source Learning Management System (LMS), emerged as a crucial tool in navigating this transition. Previous research has consistently highlighted Moodle's potential to address many of the hurdles associated with online education. For instance, studies by Acar and Kayaoglu (2020) pointed to the LMS's capacity to facilitate asynchronous communication and provide a centralized location for course materials, effectively mitigating geographical barriers and enabling flexible learning schedules. Moreover, Almaiah et al. (2020) demonstrated the positive impact of Moodle's interactive features, such as forums and quizzes, in promoting student engagement and fostering a sense of community even in a virtual environment. These findings suggest that Moodle provides a viable solution to the initial challenges of transitioning to online education by providing a customizable and accessible platform that supports both pedagogical delivery and student interaction.

Moodle learning management system is regarded as one of the most popular LMS systems in the world. For instance, Badaru and Adu (2022) reported that "34

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percent of the 26 South African public universities used Moodle as their LMS." These results are consistent with those of Mahabeer and Pintheepal (2019), who found that a sizable portion of educators used Moodle and thought it was a useful online assessment tool, characterizing it as "fast, flexible, and rewarding in giving students operational and constructive feedback." Furthermore, educators who showed signs of technology anxiety favoured using Moodle as a combination tool for reporting, monitoring, and measurement. The study by Sevnarayan (2023), which made use of observations and open-ended evaluation, supports this choice. Their study revealed that students valued the communication and interaction facilitated by the lecturers when utilizing Moodle. On the same note, Mtebe and Raphael (2018) observed that Sub-Saharan Africa's adoption rate was rising.

Despite the abundance of research on Moodle, there is a scarcity of studies that provide an integrative framework for understanding the complex interactions between technological, pedagogical, and social factors in Moodle-based learning environments. The objective of this framework is to bridge this existing gap.

Research Problem

Studies show that many first-year university students exhibit a lack of preparedness for online self-directed learning (Makhubele, 2024). Research even suggests that students lacking skills in self-directed learnings will be more likely to face failure in the complex and resource-dense domain of online learning (Preez & Grange, 2020; Moonasamy & Naidoo, 2022).

First-year university students often exhibit deficiencies in self-directed online learning skills, a situation exacerbated by the digital divide. This digital divide is described as part of a "social inequality between people in relation to their access to ICT, the frequency with which they use technology, and (most importantly) the ability to get an outcome from using ICT for diverse purposes" (Ercikan *et al.*, 2018). According to Pather, Booi and Pather (2020) this digital divide is ultimately the gap between individuals with effective access to ICTs and those without. According to Jantjies (2020), the causes of this digital divide fall under three key categories: access to physical devices; understanding of how to communicate digitally, and internet affordability. These two factors make it difficult for first year university students to have a good experience using online education. According to Naidoo and Israel (2021), the lack of digital devices, poor internet connectivity, and unaffordable data costs further contribute to challenges in online learning. According to Aboagye, Yawson, and Appiah (2020), "accessibility is the most crucial concern for students in an online learning context." As a result, without access to the necessary digital tools, university students may have difficulties transitioning to online learning environments and thus experience academic underperformance or even dropout.

Another issue faced by first-year university students is their lack of technological skills, which makes it difficult for them to effectively use Moodle online platforms (Faloye & Ajayi, 2021). Even with these challenges, students are expected to adeptly navigate Moodle for their educational needs while also grappling with basic computer operations and peripheral devices. Coman *et al.*

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(2020) emphasize that many university students do not possess the technical skills required to engage with online platforms, which negatively impacts their learning experience. A significant concern in online education is the need for students to receive training on how to use their devices for accessing online materials and utilizing office software tools (Palvia *et al.*, 2018). Unfortunately, many institutions provide only minimal guidance for accessing content, failing to recognize that not all learners have the foundational knowledge to start using their personal computers or smartphones. This problem is exacerbated by the lack of time set aside for online training (Joubert & Snyman, 2017). As a result, students may struggle to complete essential tasks like course registration or academic enrolment, leading to delays. This technical challenge is a significant hurdle for millions of university students worldwide (Pather, Booi & Pather, 2020). Those without training in using technological tools often find it difficult to access course materials and submit assignments on the required online platforms. In conclusion, Pather, Booi, and Pather (2020) emphasize that a key barrier to improving online program delivery in South African universities is the resource readiness of the average South African university student.

Research Focus

This study focuses on examining the ways in which Moodle enhances self-directed learning. Consequently, it explores the relationship between Moodle and the various elements of self-directed learning. The intention was to gain a deeper understanding of Moodle's role within the paradigm of self-directed learning.

Research Aim

The aim of this study was to develop a research-based conceptual framework that educators and instructional designers can utilize to foster learners' autonomy and engagement. This framework seeks to move beyond the traditional, instructor-centered online learning approaches and empower learners to take ownership of their educational journey. By identifying key elements that contribute to effective SDL, the framework aims to facilitate the development of essential skills such as goal setting, resource management, self-monitoring, and self-evaluation. Ultimately, the research hopes to contribute to the creation of more personalized and effective online learning experiences that cater to diverse learning styles and needs. This conceptual framework contributes significantly to both theory and practice of online learning that promotes self-directed learning. The framework may be used in developing instruments for promoting online self-directed learning. The developed conceptual framework could benefit all who are involved in supporting quality online education, in an effort to develop and impactful online practice that aligns with the corresponding educational needs, services, and resource.

Conceptualisation of SDL

Several terminologies have been conceived for describing SDL. These terminologies encompass autonomous learning, independent learning, lifelong

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learning, self-direction in learning, self-initiated learning, self-planned learning, self-instructed learning, self-regulated learning, self-managed learning, self-education, and self-teaching, all of which are associated with SDL (Hill *et al.*, 2020; Singh & Paudel, 2020). Consequently, the academic discussion on self-directed learning encompasses a wide range of viewpoints. Some researchers view self-directed learning as a process (Cadorin et al., 2017), while others see it as a trait of the learner (Zainuddin & Perera, 2018). Additionally, some interpret it as a design feature of the educational setting (Alharbi, 2018). As a result, any instance of self-directed learning includes three essential elements: a process, an individual, and a context.

SDL and technology: understanding SDL in the online context.

According to Geng, Law, and Niu (2019), the idea of self-directed learning (SDL) has been acknowledged and studied for many years; however, the digital revolution has brought it into the spotlight, altering its context due to the integration of technology in modern educational settings. The impact of technology on SDL is significant, as it has greatly improved access to informational resources and online expertise. Adigun et al. (2024) highlight that to keep up with the latest technological developments, individuals need to develop self-direction and adaptability. Understanding the key elements of self-directed learning is crucial for comprehending how students independently engage with technology in their learning processes. SDL, when combined with technology, involves using information and communication technologies (ICTs) to create learning experiences that enable individuals to take charge of planning, implementing, and assessing their own educational paths (Geng, Law & Niu, 2019).

The connection between information and communication technology (ICT) and self-directed learning is complex, particularly in educational settings. Technology enables learners to build their own understanding and promotes a sense of independence in their studies. Many studies show that technology significantly influences self-directed learning by making it easier to access online information and expertise (Asfar & Zainuddin, 2015; Mareco, 2017). For students, having access to a wide range of information that matches their interests and educational goals is crucial for effective self-directed learning. This access facilitates the processes of gathering, storing, modifying, displaying, and interacting with peers and experts around the world, all with minimal formalities (Kim *et al.*, 2014).

Models for self-directed learning

Several models were established by researchers to aid in the development of a better understanding of the application and facilitation of SDL in educational settings. This section discusses some of the most influential models of SDL.

Long (1989)

Long (1989) proposed an instructional model for SDL which comprises two dimensions, namely pedagogical control and psychological control (see figure 1).
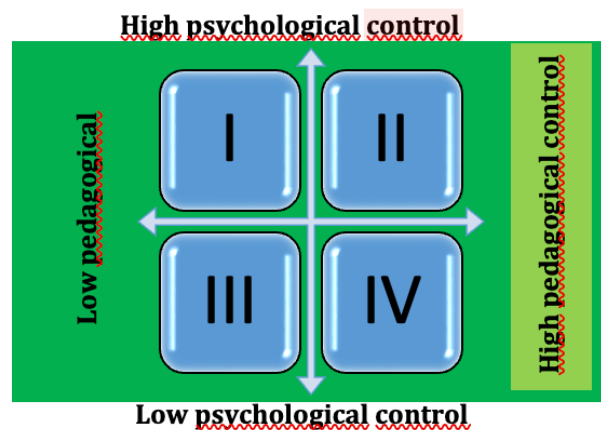
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Figure 1. Long's model for SDL (Long, 1989, p. 3)

Long (1989) defines pedagogical control "as the extent to which students are allowed to choose their own learning outcomes, use their own resources, and decide how they will be evaluated". In contrast, psychological control refers to how much a student is willing to maintain direct influence over their education. Control is the crucial element for SDL, according to Long (1989). He believes that "for SDL to occur, pedagogical control and psychological control should be in balance. Long (1989) further contends that students that demonstrate a self-directed learning style will proceed to direct their own learning without pedagogical assistance.

Candy (1991)

According to Candy (1991), self-directed learning refers to "four different but connected phenomena: personal autonomy, self-management, student control, and autodidaxy" (see figure 2).
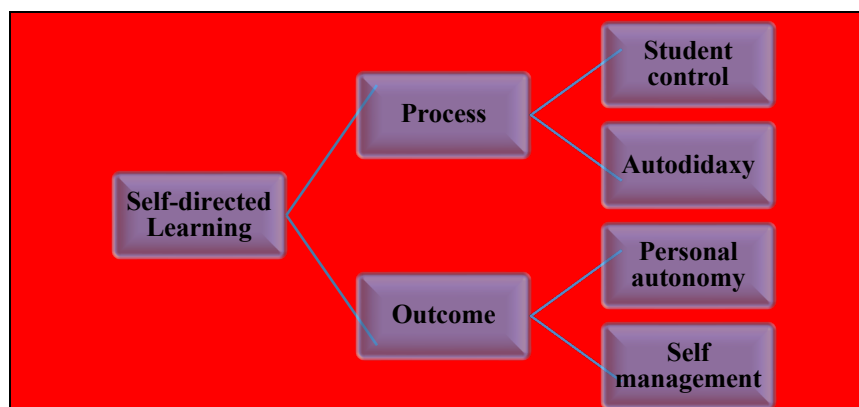

Figure 2. Candy's model for SDL (Candy, 1991, p. 22)

Candy (1991) argues that SDL encompasses both process and product (result) dimensions. According to Candy, personal autonomy represents one of the principal goals of education in all settings and all ages and refers to a personal characteristic or attribute of students and implies independence, freedom of choice, and rational reflection. Self-management refers to the willingness and

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capacity to conduct one's own education. Student control deals with control over aspects of the instructional situation, while the latter implies autodidaxy and concerns learning outside formal educational settings (Candy, 1991).

Brockett and Hiemstra (1991)

Brockett and Hiemstra (1991) created a model of Personal Responsibility Orientation (PRO) in self-directed learning (see figure 3).
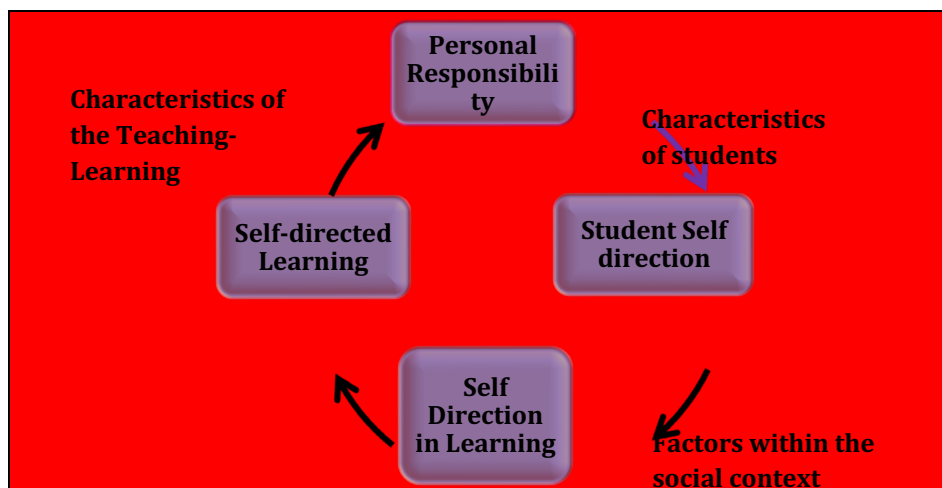

Figure 3. Brockett and Hiemstra's PRO model for SDL (Brockett & Hiemstra, 1991, p. 33)

The Brockett and Hiemstra (1991) SDL model shows two dimensions: a) personal responsibility in the teaching and learning process; and b) individual responsibility in one's own thoughts and deeds. He describes the models as follows: In the first dimension, SDL is viewed as a process in which a student assumes primary responsibility for planning, implementing, and evaluating the learning process. In the second dimension, SDL is referred to as a goal, which focuses on a student's desire or preference for assuming responsibility for learning. People have control over their response to a situation even if they do not have control over the actual circumstances in which they need to react (Brockett & Hiemstra, 1991). Students that are self-directed are both willing and eager to take charge of their own education.

The Measuring of SDL Readiness

Various researchers have employed different scales to assess SDL readiness. The following subsection explores the various scales that have been utilized in the literature to evaluate SDL readiness.

Self-Directed Learning Readiness Scale (SDLRS)

According to Premkumar et al. (2013), the Self-directed Learning Readiness Scale (SDLRS) is widely recognized as the most commonly used tool in educational research for measuring readiness for self-directed learning (SDL). Created by Guglielmino in 1977, this scale is designed to investigate the unique traits, skills, and motivations that define self-directed learners. It assesses an individual's

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readiness and cognitive preparedness for participating in SDL. The SDLRS comprises 58 items organized on a 5-point Likert scale, measuring eight distinct factors: "openness to learning opportunities, self-concept as an effective learner, initiative and independence in learning, informed acceptance of responsibility for one's own learning, love of learning, creativity, positive orientation to the future, and ability to use basic study skills and problem-solving skills" (Premkumar *et al.*, 2013). The SDLRS is structured around these factors, where higher scores reflect a greater readiness for self-directed learning.

The Self-Rating Scale of Self- Directed Learning (SRSSDL)

Williamson (2007) developed the Self-Rating Scale of Self-Directed Learning specifically for higher education, aiming to pinpoint the skills essential for lifelong learners. This scale assesses SDL behavior, rating users' self-directed learning levels as low, medium, or high on an ordinal scale. It provides an opportunity for users to reflect on their behaviors and learning progress, while also helping to maintain their motivation (Henry, 2015).

Self-Directed Learning Technology Scale (SDLTS)

The scale was created by Teo, Tan, Lee, Chai, and Koh in 2010, emphasizing the role of technology in education (Teo *et al.*, 2010). It serves as a measurement tool to evaluate individuals' skills and attitudes toward self-directed learning, particularly in relation to technology use. This scale examines several aspects of self-directed learning, such as motivation, resource management, and the ability to establish and reach personal learning objectives. By concentrating on the relationship between technology and self-directed learning, the SDLTS offers valuable insights into how learners utilize digital tools and resources to enhance their educational experiences.

Moodle Usability as a Learning Management System to Promote SDL

The effectiveness of Moodle as a learning management system that supports self-directed learning (SDL) has been thoroughly examined in numerous academic studies by researchers in the field of education. For instance, Rabaa'i (2018) investigated the factors that influence college students' decisions to use Moodle as an e-learning tool. The study found that elements like perceived ease of use, perceived usefulness, and students' attitudes had a significant positive effect on their intention to adopt the Moodle platform for online learning. In another research effort, Senol *et al*. (2014) conducted surveys to assess the perceived utility of Moodle among 413 students after its implementation at Kocaeli University in Turkey. The results indicated that many features of the Moodle interface did not meet students' expectations and needs. Furthermore, Thuseethan *et al*. (2014) carried out a survey across seven different schools to evaluate Moodle's usability from the students' viewpoint. Their research revealed various usability issues faced by students, such as challenges with logging in and submitting assignments, which negatively impacted their overall experience with the platform.

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The cited studies form a crucial foundation for the current research on self-directed learning (SDL) within the Moodle environment, directly informing the study's methodology and the designing of the framework. Previous investigations into the use of Moodle features to support SDL (e.g., specific forum formats or assignment tools) offer valuable insights into potentially effective pedagogical designs. By integrating findings from these earlier studies, this research was better equipped to assess how specific functionalities within Moodle can be utilized to promote and improve SDL.

RESEARCH METHOD

To establish a robust foundation for the conceptual framework, a comprehensive literature review was conducted. A literature review serves as the bedrock for constructing a robust conceptual framework, particularly when investigating complex topics like Moodle and Self-Directed Learning (SDL). Its strength lies in its ability to systematically unpack and synthesize existing knowledge, creating a comprehensive understanding of the landscape before building a new model. By thoroughly examining previous research, a literature review can identify key concepts, theories, and relationships relevant to the topic. The literature review employed a multi-pronged approach, initially using broad keyword searches across academic databases like ERIC, JSTOR, and Google Scholar. Keywords included "self-directed learning," "online learning," "e-learning," "learner autonomy," and "Moodle online learning,". The selection criteria prioritized peer-reviewed journal articles, book chapters, and reputable conference proceedings published within the past 15 years, focusing on empirical studies, theoretical frameworks, and practical implementations of self-directed learning in Moodle online contexts. This timeframe ensured the relevance of the literature to current technological advancements and pedagogical considerations. The analysis of the selected literature involved a thematic analysis, identifying recurring themes, key concepts, and gaps in the existing knowledge base regarding how online learning environments can best foster self-directed learning. This process allowed for a synthesis of existing ideas, highlighting areas of consensus and areas that required further exploration within the conceptual model.

RESULT AND DISCUSSION

The Presentation of The Conceptual Framework

This section outlines a conceptual framework that aims to explain the dynamics of Self-Directed Learning (SDL) in the context of Moodle as an online learning management system (LMS), as depicted in Figure 4. The development of this framework was guided by a thorough review of existing literature that examined the complex relationship between Moodle and the principles of self-directed learning. This in-depth analysis yielded important insights into how Moodle supports and improves SDL, offering a clearer understanding of its significance in online education.

SDL Meaning	Moodle learning context	SDL Learning	Guideposts to facilitate SDL	Measurement scales	SDL Outcome

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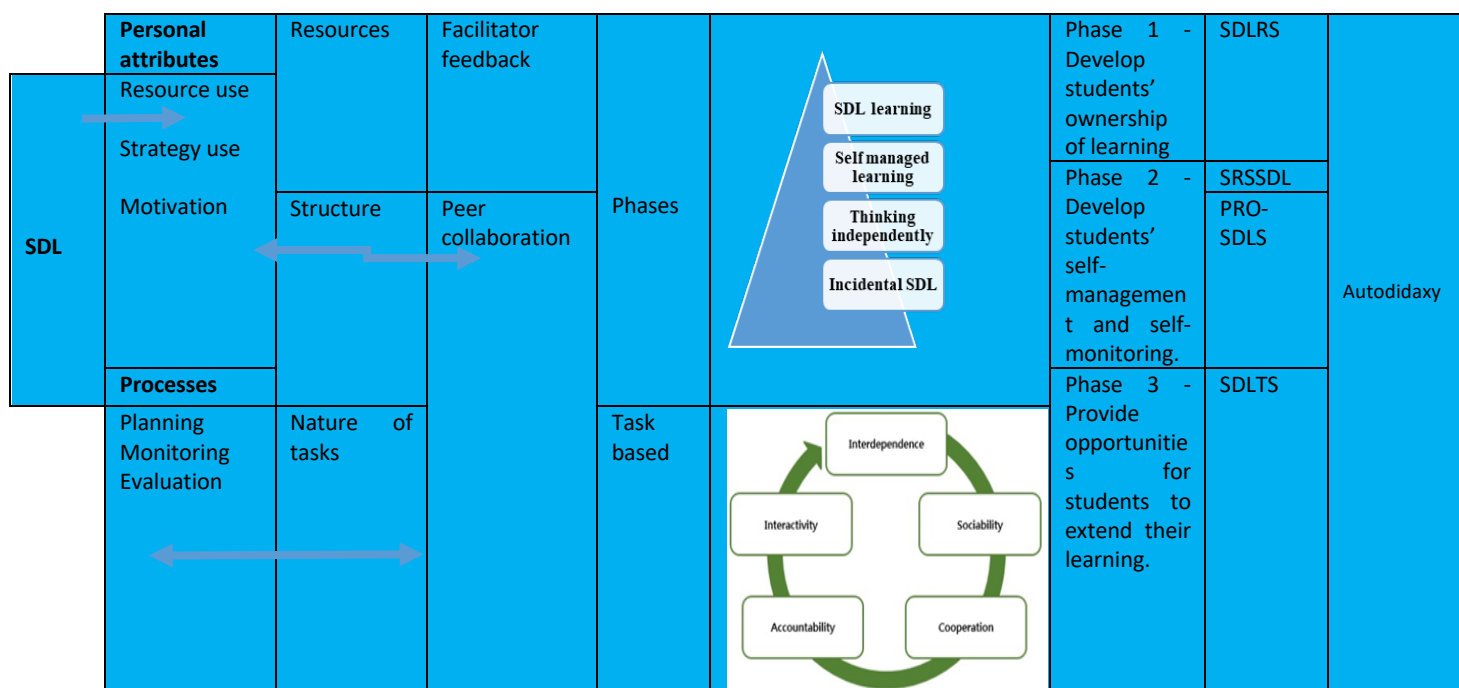| SDL	**Personal attributes**	Resources	Facilitator feedback	Phases	SDL learning / Self managed learning / Thinking independently / Incidental SDL	Phase 1 - Develop students' ownership of learning	SDLRS	Autodidaxy
	Resource use					Phase 2 - Develop students' self-management and self-monitoring.	SRSSDL / PRO-SDLS	
	Strategy use							
	Motivation	Structure	Peer collaboration					
	Processes				Interdependence / Interactivity / Sociability / Accountability / Cooperation	Phase 3 - Provide opportunities for students to extend their learning.	SDLTS	
	Planning Monitoring Evaluation	Nature of tasks		Task based				

Figure 4. The conceptual framework

Discussion of the Main Aspects of the Framework

This conceptual framework is divided into six distinct sections: Self-Directed Learning (SDL) meaning, the Moodle learning context, the nature of SDL learning, guidepost to help facilitate SDL, measurement scales for SDL, and the outcome associated with SDL. These components form the essential concepts that support this framework.

Self-Directed Learning Meaning and Moodle Learning Context

Within this framework, self-directed learning (SDL) is understood as a flexible process in which learners take responsibility for their own educational paths. This involves the stages of planning, executing, and evaluating their learning activities. This understanding aligns with Knowles' famous definition of SDL from 1975, which describes it as a process where individuals actively identify their learning needs, set educational goals, find relevant resources, choose and apply effective learning strategies, and assess the outcomes of their learning efforts (Knowles, 1975).

At the heart of this framework is the understanding that students' individual traits significantly influence their self-directed learning progress. The personal characteristics of students are crucial in facilitating self-directed learning. Factors such as motivation, self-efficacy, and resilience are key in determining how effectively students engage in independent learning. These attributes not only impact their ability to set goals and manage their studies but also affect their persistence in facing challenges.

Moodle Learning Context

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The importance of the Moodle learning environment in promoting self-directed learning is immense. This platform offers a structured yet adaptable framework that enables students to take charge of their educational paths, encouraging independence and motivation. In any self-directed learning scenario, the interaction between students' individual characteristics and their learning environment plays a crucial role in either supporting or obstructing self-directed learning.

This framework suggests that the way students' personal characteristics interact with their learning environment can either enhance or hinder self-directed learning. A nurturing atmosphere that promotes independence can strengthen the positive impact of personal traits, resulting in better academic performance. On the other hand, insufficient support may reduce the advantages of these traits, highlighting the need to cultivate both individual qualities and supportive learning settings. Furthermore, the features of Moodle, including personalized learning paths and easily accessible resources, empower learners to interact with content at their own pace. This flexibility not only accommodates different learning styles but also fosters a sense of responsibility and ownership in one's educational journey.

Guideposts that Facilitate Self Directed Learning

To improve self-directed learning in online education, this framework includes guideposts designed to help facilitators guide students toward SDL. These guideposts are organized into three separate phases, each essential for enhancing the overall effectiveness of the learning experience.

In Phase 1, facilitators are tasked with fostering students' ownership of their learning. This concept involves students actively pinpointing their knowledge gaps and setting specific educational objectives. As a result, educators must design instructional activities that encourage students to take responsibility for their learning journey. Du Toit-Brits (2020) highlights the importance of providing students with cognitive autonomy, which allows them to take charge of their learning process by formulating their own inquiries and devising solutions independently. Self-directed learning plays a crucial role in enabling students to articulate questions regarding their learning deficiencies, thereby assisting them in establishing learning objectives and conceptualizing their task designs.

Phase 2 is about developing students' self-management and self-monitoring skills. This stage requires facilitators to support students in actively engaging with these skills. It encompasses the organization of tasks, time, and resources, alongside continuous efforts to improve and take necessary actions to achieve educational objectives. In this context, Garrison (1997) articulates that self-management entails students assuming control over their learning environment to fulfil their educational goals. This control does not equate to independence; rather, it emphasizes collaboration with others within the learning context. Students do not derive meaning in isolation from the collective experience.

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The management of learning tasks is achieved through a cooperative dynamic between the teacher and the student. Garrison (1997) asserts that students should be offered various options for how they can actively engage in the learning process. He also highlights the importance of context in his framework by specifying resource self-management within a particular setting.

Self-monitoring, as defined by Garrison (1997), encompasses the capacity of students to oversee their cognitive and metacognitive processes. Consequently, self-monitoring students should therefore have the ability to exploit their own learning strategies, think about what they are thinking, take responsibility for the construction of personal meaning, be reflective and think critically, use feedback to construct meaning and take responsibility for their own learning (Garrison, 1997).

Phase 3 involves providing opportunities for students to extend their learning. This extension of learning involves establishing connections across various disciplines, bridging formal and informal educational experiences, and integrating interests both within and outside the school environment. During this phase, facilitators implement scaffolding techniques to support students in reflecting on and broadening their learning experiences. The facilitators' primary function at this stage is to guide students in relating their acquired knowledge to their daily lives, thereby increasing the relevance and authenticity of their educational journey. Martínez-Argüelles, Plana-Erta and Fitó-Bertran (2023) emphasize that for meaningful learning with information and communication technology (ICT), it is essential to anchor learning in real-world contexts and challenges. This method allows students to create concrete links between their knowledge and its practical applications. Additionally, students' involvement in authentic learning experiences can be greatly enhanced through activities that encourage them to find personal relevance in what they have learned, especially in recognizing how they can apply their knowledge in their own lives.

These phases provide a clear framework that encourages learners to take charge of their own educational paths. By grasping and moving through these stages, individuals can improve their skills in setting goals, finding resources, and assessing their progress, which ultimately results in more impactful learning experiences. Additionally, acknowledging the significance of these phases helps educators to better assist learners in building independence and critical thinking abilities. As learners interact with each phase, they develop a more profound understanding of their own learning processes, which nurtures habits of lifelong learning. This organized approach not only empowers individuals but also enhances the overall educational environment.

Measurement Scales

At the end of the learning process, this framework promotes the use of measurement scales to assess the effectiveness of self-directed learning. Examples of these scales include SDLRS, SRSSDL, PRO-SDLS, and SDLTS. The importance of these measurement scales in self-directed learning cannot be overstated. They are vital tools for evaluating learners' autonomy, motivation, and

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their ability to manage their own educational journeys. These scales help in tracking individual progress and pinpointing areas that need improvement. Moreover, using these measurement scales can significantly boost the effectiveness of self-directed learning programs. They allow educators to customize their methods according to the unique needs and traits of learners, creating a more personalized and impactful learning experience. In the end, incorporating measurement scales leads to a better understanding of the dynamics of self-directed learning.

Autodidaxy

Based on this framework, self-directed learning often leads to autodidaxy, where individuals take the initiative to pursue their own educational paths outside traditional educational institutions. Autodidaxy refers to the process of self-teaching. As a result, the culmination of this self-directed learning journey is an autodidact, or a self-taught person. The term "autodidact" itself has been traced back to the Greek "autodidaktos," meaning "self-taught," (Liyanagunawardena & Williams, 2018)

An autodidact, at its core, is someone who is self-taught, someone who takes the initiative to learn a subject or skill on their own, rather than relying solely on formal education or traditional instruction. This pursuit of knowledge is driven by his/her own curiosity and intrinsic motivation, often venturing beyond the confines of established curricula. This person might utilize a diverse range of resources, including books, documentaries, online courses, and real-world experimentation. More than just learning independently, autodidacticism embodies a particular mindset – one characterized by resourcefulness, a love for learning, and a willingness to challenge conventional wisdom. It's a journey of personal discovery fueled by a deep desire to understand the world around them. An autodidact engages in intellectual exploration without the guidance of a teacher or a structured educational system. Successful self-education requires a significant level of self-discipline and the capacity for reflective thinking. Therefore, an autodidact is defined as someone who educates themselves independently, rather than depending on formal instruction from an educator. This person has gained mastery in a subject without the benefits of a teacher or traditional educational environments.

CONCLUSION

The purpose of this study was to create a conceptual framework based on empirical evidence to enhance the understanding of Self-Directed Learning in Moodle online learning environments. This effort included developing a framework that stems from an extensive review of the current literature related to Self-Directed Learning and the Moodle Learning Management System. The literature review on Moodle and self-directed learning yielded several critical insights that significantly shaped the development of our conceptual framework. The research consistently highlighted Moodle's potential as a powerful platform to facilitate self-directed learning, moving beyond mere content delivery to

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supporting active learning strategies. Studies emphasized the importance of Moodle features that promote student autonomy, such as customizable learning paths, opportunities for self-monitoring through progress tracking, and access to a variety of resources for independent exploration. This insight led to the incorporation of a strong emphasis on learner agency and control within the study's framework. These core insights, drawn from the body of existing research, formed the foundation upon which the framework was developed. This study significantly contributes to the field of Self-Directed Learning (SDL) and the implementation of Moodle in various ways. By examining the interplay between SDL principles and the Moodle platform, this study aspires to deliver a detailed understanding of how to effectively design and implement SDL environments utilizing Moodle. Moreover, by scrutinizing the contextual factors that impact SDL within Moodle frameworks, this study aims to yield insights that can enhance SDL practices in a range of educational scenarios. The study also seeks to deepen our comprehension of SDL in online learning by addressing the distinct challenges and opportunities that Moodle-based environments present. This study presents several potential gaps and areas that warrant further investigation. Additional research is necessary to validate the conceptual framework and to examine the long-term sustainability of self-directed Learning within Moodle-based learning environments

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REFERENCES

Aboagye, E., Yawson, J.A., & Appiah, K.N. (2020). COVID-19 and E-Learning: The Challenges of Students in Tertiary Institutions. *Social Education Research*, 2(1), 1–8.

Acar, A., & Kayaoglu, M. N. (2020). Moodle as a potential tool for language education under the shadow of covid-19. *Eurasian Journal of Educational Research,* 90, 67-82.

Adigun et al. (2024). Fostering self-directed learning in blended learning environments: A constructivist perspective in Higher Education. Higher Education Quarterly. 79. 12572. 10.1111/hequ.12572.

Alharbi, H.A. (2018). Readiness for self-directed learning: How bridging and traditional nursing students differs? *Nurse Educ. Today*, 61, 231–234.

Almaiah, M. A., Al-Khasawneh, A., & Al-Lozi, E. (2020). Evaluating the usability and acceptance of Moodle as an e-learning platform by students. *International Journal of Interactive Mobile Technologies*, 14(1), 119-134.

Asfar, N., & Zainuddin, Z. (2015). Secondary students' perceptions of information, communication and technology (ICT) use in promoting self-directed learning in Malaysia. *The Online Journal of Distance Education and e-Learning*, 3(4), 67-82.

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Badaru, K., & Adu, E. (2022). Platformisation of Education: An Analysis of South African Universities' Learning Management Systems. *Research in Social Sciences and Technology*, *7*(2), 66-86.

Liyanagunawardena, T. R., & Williams, S. (2018). Social media in higher education: A systematic review. Journal of Educational Technology & Society, 21(4), 232-251.

Brockett, R. G., & Hiemstra, R. (1991). Self-direction in adult learning: Perspectives on theory, research, and practice. New York: Routledge.

Cadorin, L., Ghezzi, V., Camillo, M., & Palese, A. (2017). The self-rating scale of self-directed learning tool: findings from a confirmatory factor analysis. J Nurs Educ Pract 7, 31-37.

Candy, P.C. (1991). Self-direction for lifelong learning: A comprehensive guide to theory and practice. San Francisco: Jossey-Bass.

Coman, C., T, Tîru, L.G., Meseșan-Schmitz, L., Stanciu, C., & Bularca, M.C. (2020). Online Teaching and Learning in Higher Education during the Coronavirus Pandemic: Students' Perspective. *Sustainability*, 12(4), 1-24.

Du Preez, P. & Le Grange, L. (2020) The COVID-19 Pandemic, Online Teaching/ Learning, the Digital Divide, and Epistemological Access. *Alternation,* 1(7), 90-106.

Du Toit-Brits, C. (2020). Towards a Transformative and Holistic Continuing Self-Directed Learning Theory. *South African Journal of Higher Education,* 32 (4), 51-65.

Ercikan, K., Asil, M., & Grover, R. (2018). Digital divide: A critical context for digitally based assessments. *Education Policy Analysis Archives*, 26, 51.

Faloye, S.T. & Ajayi, N. (2021): Understanding the impact of the digital divide on South African students in higher educational institutions. *African Journal of Science, Technology, Innovation and Development*, 14(43), 1-11.

Garrison, D.R. (1997). Self-directed learning: Toward a comprehensive model. *Adult Education Quarterly*, 48(1), 18–33.

Geng, S., Law, K.M.Y., & Niu, B. (2019). Investigating self-directed learning and technology readiness in blending learning environment. *International Journal of Educational Technology in Higher Education*, 16 (17), 1-22.

Henry, K. (2015). Measuring Self-Directed Learning: A Diagnostic Tool for Adult Learners. *Journal of University Teaching & Learning Practice*, 12(2), 1-15.

Hill, M., Peters, M., Salvaggio, M., Vinnedge, J., & Darden, A. (2020). Implementation and evaluation of a self-directed learning activity for first-year medical students. *Medical Education Online*, 25(1), 1-10.

Jantjies, M. (2020) *How South Africa can address digital inequalities in e-learning. https://theconversation.* com/how-south-africa-can-address-digital-inequalities-in-e-learning-137086. Accessed July 12, 2023.

Joubert, Y., & Snyman, A. (2017). Challenges experienced with online tutoring in an old institution. *Progressio*, 39 (1), 126-145.

Kim, R., Olfman, L., Ryan, T., & Eryilmaz, E. (2014). Leveraging a personalized system to improve self-directed learning in online educational environments. *Computers & Education*, 70, 150–160.

Corresponding author: Makhubele Yeyisani Evans (yeyisani@gmail.com)

Knowles, M. S. (1975). Self-directed learning. A guide for learners and teachers. Englewood Cliffs: Prentice Hall.

Long, H. B. (1989). Self-directed learning: merging theory and practice. (In Long, H. B. Self-directed learning merging theory and practice. Oklahoma: Research Center for Continuing Professional and Higher Education of the University of Oklahoma.

Mahabeer, M. & Pintheepal, T. (2019). Online Formative Assessment Tools: Lecturers Experiences of Using Moodle at a University in South Africa. *Journal of Educational Studies*, 18(1), 46-63.

Makhubele Y.E. (2024). The Investigation of First Year University Students' Online Self-Directed Readiness Level. *Journal of Education and Teaching (JET)*, 5(2).

Moonasamy, A, R, & Naidoo, G. M. (2022). Digital Learning Challenges experienced by South African university students' during the COVID-19 pandemic. *The Independent Journal of Teaching and Learning*, *17*(2), 76-90.

Mtebe, J.S. & Raphael, C. (2018). Key factors in learners' satisfaction with the e-learning system at the University of Dar es Salaam, Tanzania. *Australasian Journal of Educational Technology*, 34(4), 107-122.

Naidoo, G.M. & Israel, C. (2021) A Critique of Online Learning in Higher Education during the Coronavirus Lockdown Level 5 in South Africa. *African Journal of Development Studies,* 11(1), 127-146.

Pather, S., Booi, E. & Pather, S. (2020). An assessment of student resource readiness for online learning during COVID-19: A South African case study. *Proceedings of ICERI2020 Conference*, doi:10.21125/ iceri.2020.2186. Accessed July 12, 2023.

Palvia, S., Aeron, P., Gupta, P., Mahapatra, D., Parida, R., Rosner, R., et al. (2018). Online Education: Worldwide Status, Challenges, Trends, and Implications. *Journal of Global Information Technology Management*, 21 (4), 233-241.

Premkumar, K., Pahwa, P., Banerjee, A., Baptiste, K., Bhatt, H. & Lim, H.J. (2013). Does Medical Training Promote or Deter Self-Directed Learning? A Longitudinal Mixed-Methods Study". *Academic medicine: Journal of the Association of American Medical Colleges*, 88(11):1754-1764.

Rabaa'i, A.A. (2016). Extending the Technology Acceptance Model (TAM) to assess Students' Behavioural Intentions to adopt an e-Learning System: The Case of Moodle as a Learning Tool. *Journal of Emerging Trends in Engineering and Applied Sciences*, 7(1): 13- 30.

Martínez-Argüelles, M.J., Plana-Erta, D. & Fitó-Bertran, À. (2023). Impact of using authentic online learning environments on students' perceived employability. *Education Tech Research Dev* 71, 605–627. https://doi.org/10.1007/s11423-022-10171-3

Senol, l., Gecili, H., & Durdu, P. (2014). Usability evaluation of a Moodle based learning management system. In Proceedings of EdMedia 201, Tampere, Finland, June 23-26.

Sevnarayan, K. (2023). Moodle as a Tool to Reduce Transactional Distance at an Open Distance and e-Learning University. *Studies in Learning and Teaching*, *4*(1), 13-29.

Singh, I., & Paudel, B. (2020). Readiness for self-directed learning among nursing students in a medical college, Chitwan. *Journal of Chitwan Medical College*. 10(31), 27-30.

Teo, T., Tan, S. C., Lee, C. B., Chai, C. S., & Koh, J. H. L. (2010). The self-directed learning with technology scale (SDLTS) for young students: An initial development and validation. *Computers & Education*, 55(4), 1764–1771.

Thuseethan, S., Achchuthan, S., & Kuhanesan, S. (2014). Usability evaluation of learning management systems in Sri Lankan universities. *Global Journal of Computer Science and Technology*, 15(1), 1-13.

Williamson, S. N. (2007). Development of a self-rating scale of self-directed learning. *Nurse Researcher*, 14, 66–83.

Zainuddin, Z., & Perera, C.J. (2018). Supporting students' self-directed learning in the flipped classroom through the LMS TES BlendSpace. *On the Horizon*, 26 (4), 281-290.

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