Unlocking Self-Directed Learning Readiness: A Systematic Exploration of Influential Factors

Piratheeban.K[1] and Bandara.K[2]

[1,2]*Faculty of Education, University of Colombo, Sri Lanka*

Abstract

Self-Directed Learning Readiness (SDLR) is critical in contemporary education, enabling learners to take ownership of their learning processes. This systematic literature review consolidates insights from 23 studies published between 1986 and 2023 to analyze factors influencing SDLR across diverse educational contexts. The objectives were to identify, categorize, and understand the factors affecting SDLR, providing a comprehensive framework to inform educational strategies and policies. The methodology involved a rigorous selection process using databases such as PubMed, Google Scholar, JSTOR, ERIC, and Science Direct. Inclusion criteria were established to ensure relevance and quality, focusing on studies specifically addressing SDLR and pertaining to educational settings. A standardized extraction form was used to capture study details, and thematic analysis was employed to identify recurring themes and variations. Biases were minimized through a systematic approach to literature selection and data extraction. The review identified 50 factors influencing SDLR, categorized into five primary themes: student-related, contextual, teacher-related, sociocultural, and technological factors. Student-related factors were further divided into personal attributes, psychological factors, cognitive factors, and behavioral factors. Contextual factors were grouped into environmental, interpersonal, and institutional subthemes. Teacher-related factors were categorized into instructional approaches and support and feedback. Sociocultural factors included cultural influences and academic landscape, while technological factors were divided into technology access and competencies, and integration and utilization. Key findings reveal that student traits like motivation and self-efficacy, contextual elements such as family support and learning environments, and teacher-related practices significantly shape readiness for self-directed learning. Sociocultural influences and technological advancements also play critical roles in enhancing SDLR by shaping learning approaches and providing supportive tools. This study provides a comprehensive framework to identify and categorize factors influencing SDLR, emphasizing the importance of understanding these dynamics to inform tailored educational strategies and policies. By addressing these factors, educators and policymakers can foster environments conducive to self-directed learning, equipping students with essential skills for lifelong learning and success in an increasingly complex world.

Keywords: Self-Directed Learning Readiness, Factors affecting, online learning, student autonomy, Self-efficacy

Background of the Study

Self-Directed Learning (SDL) has been extensively researched and implemented over the past five decades, emphasizing its critical role in fostering lifelong learning and aligning with Sustainable Development Goal 4, which advocates for inclusive and equitable quality education. In contemporary educational discourse, SDL is recognized as a pivotal determinant of student success and achievement. First popularized within discussions on adult education by Malcolm Knowles in 1968, SDL represents an educational approach wherein learners assume responsibility for their learning (Bosch, 2017). Knowles' seminal work delineated the distinction between adult and child learners, proposing an educational model termed andragogy, where SDL emerged as a fundamental component (Merriam, 2001). He defined SDL as a process in which individuals take the initiative in diagnosing their learning needs, formulating goals, identifying resources, selecting strategies, and evaluating outcomes (Knowles, 1975).

Research underscores that SDL is influenced by various factors, including the facilitator, learner, teaching–learning strategies, and the environment, all of which impact the promotion of SDL among learners (Mentz et al., 2018). This, in turn, influences Self-Directed Learning Readiness (SDLR), which refers to the extent to which individuals have the attitudes, aptitudes, and personal characteristics required for SDL (Wiley, 1983). Evidence suggests that not all students are equally skilled or willing to make decisions about their learning. Some learners prefer to rely on their teachers for determining learning objectives and planning study (O'Shea, 2003).

Globally, various initiatives have been taken to develop SDL skills among students. The Sri Lankan Ministry of Higher Education has implemented policies such as the Sri Lanka Qualification Framework (SLQF), outcome-based education, and the K-SAM model to promote SDL in higher education (Bandara, 2022). However, Bandara (2022) observed that the current academic environment and culture in the fields of humanities and social sciences in Sri Lankan higher education institutions fail to encourage undergraduates to develop SDL skills. This reveals a disparity between policy initiatives and the actual development of SDL skills among students.

If a student has a high level of SDL skills, they are likely to have a high level of SDLR. However, if policy initiatives are to be successful, it is crucial that SDLR is high among students. If SDLR is not sufficiently developed, appropriate measures must be taken to improve it. To take these measures, the factors influencing SDLR must be identified. Therefore, synthesizing the globally identified factors influencing SDLR through a systematic literature review is essential. This synthesis will aid in the successful implementation of policy initiatives aimed at enhancing SDLR, ultimately fostering an educational environment conducive to SDL.

Problem Statement of the Study

Despite various global and national policy initiatives aimed at fostering Self-Directed Learning (SDL) skills among students, there remains a significant gap in understanding the comprehensive factors influencing Self-Directed Learning Readiness (SDLR), necessitating a systematic literature review to identify and categorize these factors for effective implementation of SDL strategies.

Aim of the Study

The aim of this study is to systematically review and synthesize existing literature on the factors influencing Self-Directed Learning Readiness (SDLR).

Objectives of the Study

1. To examine the available literature on SDLR to identify and categorize the influencing factors.

2. To construct a comprehensive theoretical framework to identify the factors influencing SDLR.

Research Design and Methods

Literature Search and Selection

This systematic literature review investigates factors influencing Self-Directed Learning Readiness (SDLR) across diverse educational contexts by analyzing 23 studies from 1986 to 2023. Comprehensive searches were conducted using databases such as PubMed, Google Scholar, JSTOR, ERIC, and Science Direct. The search terms employed included "Self-Directed Learning Readiness," "SDL factors," and "educational contexts" to ensure a broad and relevant collection of studies.

Inclusion Criteria

The inclusion criteria for selecting studies were as follows: Studies must specifically address factors influencing Self-Directed Learning Readiness (SDLR). Furthermore, the studies had to pertain to educational settings, such as higher education, medical education, and other relevant educational contexts. Additionally, only studies published between 1986 and 2023 were considered to offer a comprehensive historical perspective on the topic.

Data Extraction and Analysis

A standardized data extraction form was utilized to systematically capture critical details from each study. This form included sections for the study's context, sample characteristics, and factors influencing SDLR. The extraction process comprised two main steps: an initial review to assess relevance based on the

inclusion criteria, followed by detailed extraction of data such as sample size, educational context, identified factors, and key findings from the studies deemed relevant.

Categorization of Factors

The factors identified in the studies were categorized into five major themes, each consisting of several subthemes. These themes were: (1) Student-Related Factors, which include personal attributes, psychological factors, cognitive factors, and behavioral factors; (2) Contextual Factors, encompassing environmental, interpersonal, and institutional elements; (3) Teacher-Related Factors, covering instructional approaches and support/feedback; (4) Sociocultural Factors, including cultural influences and the academic landscape; and (5) Technological Factors, focusing on technology access, competencies, integration, and utilization.

Analytical Approach

Descriptive analysis was employed to summarize the prevalence of each factor across the selected studies, providing an overview of the most frequently identified influences on SDLR. Thematic analysis was conducted to identify recurring themes and variations in the factors affecting SDLR across different educational contexts. This analysis involved coding the extracted data and organizing it into the previously mentioned themes and subthemes.

Justification of Literature Selection and Chronological Distribution

This systematic review examines literature published between 1986 and 2023 to provide a comprehensive analysis of factors influencing Self-Directed Learning Readiness (SDLR). The starting point of 1986 was chosen because it marks the period when significant theoretical developments in self-directed learning, particularly Malcolm Knowles' work on andragogy, began gaining traction. Knowles' contributions laid the groundwork for understanding self-directed learning as a key component of adult education, making this an appropriate starting point for our review.

The literature searches spans until 2023 to ensure the inclusion of the most recent studies, reflecting current trends and technological advancements that impact SDLR. By covering this extensive time frame, the review captures the evolution of SDL theories and practices, providing a historical context while also highlighting recent innovations and findings.

To ensure the analysis is up to date, the chronological distribution of the literature is indicated in Table 1, showing the frequency of publications and key developments over the years. This approach not only validates the relevance of older foundational studies but also underscores the importance of incorporating recent research to address the rapidly evolving educational landscape.

Table 1: Chronological distribution of selected literature

Time period	Number of studies	Key developments
1986-2005	03	Foundational theories on SDL, Growth in empirical studies, introduction of new SDL models
2006-2015	06	Advances in technology integration, increased focus on SDL in higher education
2016-2023	14	Recent innovations in digital learning, emphasis on SDLR in diverse educational contexts

(Source: Researcher)

By including literature from this extensive period, the review aims to offer a balanced and comprehensive perspective, bridging historical insights with contemporary advancements to inform educators and policymakers on effective strategies for enhancing SDLR.

Results and Findings

Factors Influencing Self-Directed Learning Readiness

The systematic literature review identified and analyzed factors influencing Self-Directed Learning Readiness (SDLR) across diverse educational contexts, drawing on 23 studies published between 1986 and 2023. The findings are categorized into five primary themes: student-related factors, contextual factors, teacher-related factors, sociocultural factors, and technological factors.

1. **Student-related Factors**: Student-related factors encompass personal attributes and characteristics that impact a student's ability to engage in self-directed learning. These include learning style (O'Kell, 1988), Leaning strategies (Alegado et al., 2023), year of training (Nyambe et al., 2016; O'Kell, 1988), desire to learn (Nyambe et al., 2016), self-control (Nyambe et al., 2016), self-management (Nyambe et al., 2016; Ramli et al., 2018), problem-solving ability (Wong et al., 2021), self-efficacy (Wong et al., 2021; Vaiciūnienė & Kazlauskienė, 2023; Oddi, 1986; Guglielmino, 2008; Kim & Park, 2011, Alegado et al., 2023), age (Wong et al., 2021; Slater & Cusick, 2017; Yang et al., 2021; Monkaresi et al., 2015; Koirala et al., 2021, Piratheeban, 2023), gender (Wong et al., 2021; Slater & Cusick, 2017; Monkaresi et al., 2015, Hussain et al., 2019), Vandanah Gooria

et al., 2021), learning attitude (Wong et al., 2021), interest in subjects (Munasinghe et al., 2020; Ramli et al., 2018), perceptions of topics (Munasinghe et al., 2020; Leatemia et al., 2016), mood and emotional state (Leatemia et al., 2016; Kim & Park, 2011), prior knowledge (Munasinghe et al., 2020), future goals (Munasinghe et al., 2020), time management skills (Vaiciūnienė & Kazlauskienė, 2023; Oddi, 1986; Guglielmino, 2008), marital status (Koirala et al., 2021, Hussain et al., 2019), confidence (Yang et al., 2021), self-esteem (Kim & Park, 2011), achievement motivation (Ramli et al., 2018), academic self-concept (Ramli et al., 2018), intelligence (Nyambe et al., 2016), academic performance (Yang et al., 2021; Monroe, 2016, Vandanah Gooria et al., 2021), Alegado et al., 2023)), learning goals (Yang et al., 2021), learning approach (Monkaresi et al., 2015; Kek & Huijser, 2011), physical health (Nyambe et al., 2016), self-motivation (Piratheeban, 2023), Alegado et al., 2023), self-regulation (Piratheeban, 2023), Alegado et al., 2023), Collaboration and Communication (Piratheeban, 2023), and leisure time (Nyambe et al., 2016).

For student-related factors, four subthemes have been identified encompassing 30 factors: Personal Attributes (3 factors) including age, gender, and marital status; Psychological Factors (14 factors) such as motivation, self-efficacy, and self-control; Cognitive Factors (6 factors) including learning strategies and prior knowledge; and Behavioral Factors (7 factors) such as time management skills and collaboration.

2. **Contextual Factors**: Contextual factors refer to external elements in the student's immediate learning environment that affect their readiness for self-directed learning. These include family support (Nyambe et al., 2016; Ramli et al., 2018), peer relationships (Nyambe et al., 2016; Ramli et al., 2018), learning environment (Nyambe et al., 2016; Wong et al., 2021; Vaiciūnienė & Kazlauskienė, 2023; Monkaresi et al., 2015; Kek & Huijser, 2011; Leatemia et al., 2016), access to resources (Munasinghe et al., 2020; Vaiciūnienė & Kazlauskienė, 2023; Yang et al., 2021), physical environment (Vaiciūnienė & Kazlauskienė, 2023), feedback mechanisms (Vaiciūnienė & Kazlauskienė, 2023; Monroe, 2016), Course persuade (Piratheeban, 2023), Prior exposure to online courses (Vandanah Gooria et al., 2021), and Awareness of self-directed learning strategies (Alegado et al., 2023).

Contextual factors are divided into three subthemes with 6 factors: Environmental Factors (2 factors) including physical environment and access to resources; Interpersonal Factors (2 factors) like family support and peer relationships; and Institutional Factors (2 factors) such as course persuade and prior exposure to online courses.

3. **Teacher-Related Factors:** Teacher-related factors include characteristics and actions of teachers that influence students' self-directed learning. This encompasses teaching methods (O'Kell, 1988; Munasinghe et al., 2020; Wong et al., 2021; Kek & Huijser, 2011), support from educators (Wong et al., 2021; Vaiciūnienė & Kazlauskienė, 2023; Grow, 1991), facilitative teaching style (Grow, 1991), and constructive feedback (Grow, 1991).

   Teacher-related factors have two subthemes covering 4 factors: Instructional Approaches (2 factors) such as teaching methods and facilitative teaching style; and Support and Feedback (2 factors) including support from educators and constructive feedback.

4. **Sociocultural Factors**: Sociocultural factors encompass broader cultural and social influences that shape a student's approach to learning. These include area of specialization (O'Kell, 1988), cultural factors (Wong et al., 2021; Brookfield, 2009), support (Alegado et al., 2023), and parental involvement (Kek & Huijser, 2011).

   Sociocultural factors are classified into two subthemes with 4 factors: Cultural Influences (2 factors) including cultural factors and parental involvement; and Academic Landscape (2 factors) such as area of specialization and institutional support.

5. **Technological Factors**: Technological factors highlight the role of technology in facilitating or hindering self-directed learning. This encompasses technological resources (Vaiciūnienė & Kazlauskienė, 2023; Barnard-Brak et al., 2010), online learning platforms (Barnard-Brak et al., 2010), digital resources (Barnard-Brak et al., 2010), technology integration and online learning (Vandanah Gooria et al., 2021), Computer/technology skills (Vandanah Gooria et al., 2021), and utilization of library resources (Yang et al., 2021).

   Technological factors are grouped into two subthemes with 6 factors: Technology Access and Competencies (4 factors) including technological resources and computer/technology skills; and Integration and Utilization (2 factors) such as technology integration and utilization of library resources.

The study categorizes 50 factors impacting SDLR into five main themes and their respective subthemes, providing a comprehensive framework for understanding these influences across diverse educational contexts. These themes encompass student-related, contextual, teacher-related, sociocultural, and technological factors, each with specific subthemes that highlight the multifaceted nature of SDLR. Table 2 below summarizes the factors, subthemes, and themes identified in this review, offering a detailed overview of the various elements that contribute to students' readiness for self-directed learning.

Table 2: Summary of identified Factors, Subthemes, and Themes

Factors	Sub themes	Themes
Age, Gender, Marital status	Personal Attributes	Student-related Factors
Motivation, Desire to learn, Self-control, Self-management Self-efficacy, Learning attitude Mood and emotional state, Confidence, Self-esteem, Achievement motivation, Academic self-concept, Intelligence, Self-motivation, and Self-regulation	Psychological Factors	
Learning style, Learning strategies, Problem-solving ability, Prior knowledge, Learning goals, Learning approach	Cognitive Factors	
Time management skills, Collaboration and communication, Leisure time Interest in subjects, Perceptions of topics, Future goals, Academic performance	Behavioral Factors	
Physical environment, Access to resources	Environmental Factors	Contextual Factors
Family support, Peer relationships	Interpersonal Factors	
Course persuade, Prior exposure to online courses	Institutional Factors	
Teaching methods, Facilitative teaching style	Instructional Approaches	Teacher-related Factors
Support from educators, Constructive feedback	Support and Feedback	
Cultural factors, Parental involvement	Cultural Influences	Sociocultural Factors
Area of specialization, Institutional Support	Academic Landscape	
Technological resources, Online learning platforms, Digital resources, and Computer/technology skills	Technology Access and Competencies	Technological Factors
Technology integration and online learning, and Utilization of library resources	Integration and Utilization	

(Source: Researcher)

Based on the above findings, the constructed theoretical framework for factors influencing SDLR is provided below (Figure 1).

Theoretical Framework for Factors influencing SDLR

Personal Attributes
Age, Gender, Marital status

Psychological Factors
Motivation, Desire to learn, Self-control, Self-management, Self-efficacy, Learning attitude, Mood and emotional state, Confidence, Self-esteem, Achievement motivation, Academic self-concept, Intelligence, Self-motivation, Self-regulation

Cognitive Factors
Learning style, Learning strategies, Problem-solving ability, Prior knowledge, Learning goals, Learning approach

Behavioral Factors
Time management skills, Collaboration and communication, Leisure time, Interest in subjects, Perceptions of topics, Future goals, Academic performance

Environmental Factors
Physical environment, and Access to resources

Interpersonal Factors
Family support, and Peer relationships

Institutional Factors
Course persuade, and Prior exposure to online courses

Instructional Approaches
Teaching methods, and Facilitative teaching style status

Support and Feedback
Support from educators, and Feedback

Cultural Influences
Cultural factors, and Parental involvement

Academic Landscape
Area of specialization, Institutional Support

Technology Access and Competencies
Technological resources, Online learning platforms, Digital resources, and technology skills

Integration and Utilization
Technology integration and online learning, and Utilization of library resources

Student-related Factors

Contextual Factors

Teacher-related Factors

Sociocultural factors

Technological Factors

SDLR
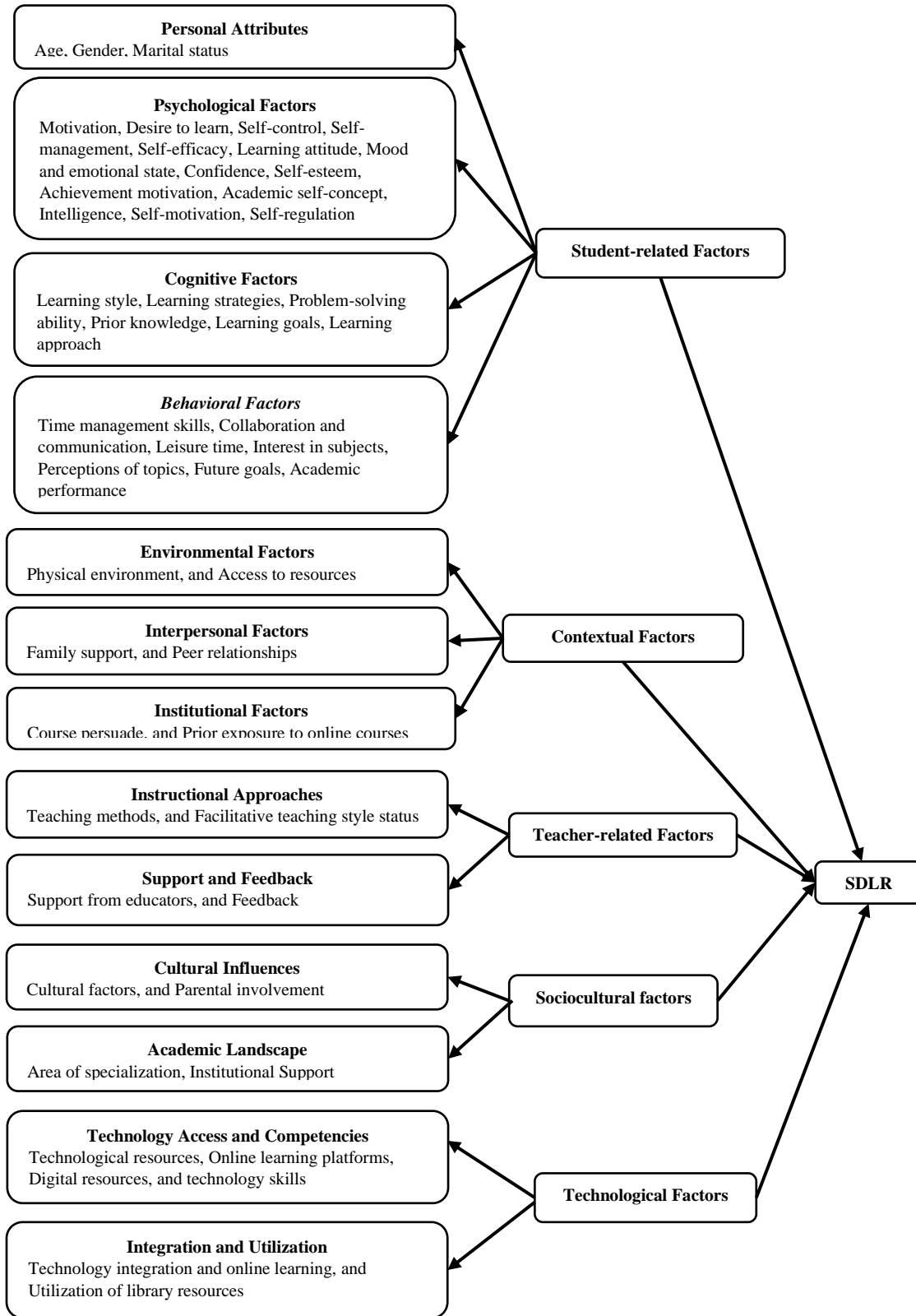
Figure 1: Theoretical Framework   Source: Researcher

Conclusion

This systematic literature review highlights the importance of Self-Directed Learning Readiness (SDLR) in modern education, emphasizing learners' abilities to manage their learning, adapt to different educational contexts, and cultivate lifelong learning skills. The study identified several key factors influencing SDLR, including student-related traits such as motivation and self-efficacy, contextual elements like family support and conducive learning environments, and teacher-related practices that promote self-directed learning. Sociocultural influences and technological advancements were also found to significantly shape learning approaches and provide essential tools for enhancing SDLR.

References

Alegado, E. S., Mae, E., Princes Joy Roxas, & Mae, A. (2023). S*elf-directed learning among secondary education students specializing in english at um digos college, philippines*. *10*(8). https://doi.org/10.46827/ejes.v10i8.4908

Bandara, K. (2022). Self-directed learning in higher education in Sri Lanka: Challenges in implementing policy. Sri Lanka Journal of Education, 1(1), 89–104. (n.d.).

Barnard-Brak, L., Paton, V. O., & Lan, W. Y. (2010). Profiles in self-regulated learning in the online learning environment. *The International Review of Research in Open and Distributed Learning*, *11*(1), 61. https://doi.org/10.19173/irrodl.v11i1.769

Bosch, C., 2017, "Promoting self-directed learning through the implementation of cooperative learning in a higher education blended learning environment", PhD thesis, Faculty of Education, North-West University. (n.d.).

Brookfield, S. D. (2009). Self-Directed Learning. International Handbook of Education for the Changing World of Work, 2615–2627. doi:10.1007/978-1-4020-5281-1_172 . (n.d.).

Grow, G. O. (1991). Teaching Learners To Be Self-Directed. *Adult Education Quarterly*, *41*(3), 125–149. https://doi.org/10.1177/0001848191041003001

Guglielmino, L. M. (2008). Why self-directed learning? *International Journal of Self-Directed Learning*, *5*(1), 1–14.

Hussain, T., Sabar, A., & Jabeen, R. (2019). A Study of the Association between Self-Directed Learning Readiness and Academic Achievement of Student-Teachers in Pakistan. *Bulletin of Education and Research*, *41*(3), 193–202. https://eric.ed.gov/?id=EJ1244640

Kek, M., & Huijser, H. (2011). Exploring the combined relationships of student and teacher factors on learning approaches and self-directed learning readiness at a Malaysian university. *Studies in Higher Education*, *36*(2), 185–208. https://doi.org/10.1080/03075070903519210

Kim, M., & Park, S.-Y. (2011). Factors Affecting the Self-directed Learning of Students at Clinical Practice Course for Advanced Practice Nurse. *Asian Nursing Research*, *5*(1), 48–59. https://doi.org/10.1016/s1976-1317(11)60013-3

Koirala, N., Kafle, S. P., & Koirala, A. (2021). Factors affecting self-directed learning readiness of the undergraduate nursing students from purbanchal university, nepal: a cross-sectional study. *Journal of Chitwan Medical College*, *11*(3), 31–35. https://doi.org/10.54530/jcmc.480

Leatemia, L. D., Susilo, A. P., & van Berkel, H. (2016). Self-directed learning readiness of Asian students: students perspective on a hybrid problem based learning curriculum. *International Journal of Medical Education*, *7*, 385–392. https://doi.org/10.5116/ijme.582e.021b

Malcolm Shepherd Knowles. (1975). *Self-directed Learning: A Guide for Learners and Teachers* (p. 18). Cambridge Adult Education, Prentice Hall Regents.

Merriam, S. B., & Bierema, L. L. (2014). *Adult learning : Linking theory and practice*. Jossey-Bass, a Wiley Brand.

Merriam, S. B. (2001). Andragogy and Self-Directed Learning: Pillars of Adult Learning Theory. *New Directions for Adult and Continuing Education*, *2001*(89), 3–13. https://doi.org/10.1002/ace.3

Mentz, E., Bailey, R., Verster, M. & Breed, B. 2018, 'Incorporating Active Teaching– Learning Strategies to Enhance Self-Directed Learning within the Curriculum as Praxis: An Imperative for the 21st Century', in C.C. Wolhuter (ed.), *Raising the Impact of Education Research in Africa*, pp. 151–180, AOSIS, Cape Town. https://doi.org/10.4102/aosis.2018.BK53.08

Monkaresi, H., Abbasi, A., & Razyani, R. (2015). Factors Affecting the Self-directed Learning Readiness. *European Online Journal of Natural and Social Sciences*, *4*(4), pp. 865–874. https://european-science.com/eojnss/article/view/3161

Monroe, K. S. (2016). The relationship between assessment methods and self-directed learning readiness in medical education. *International Journal of Medical Education*, *7*, 75–80. https://doi.org/10.5116/ijme.56bd.b282

Munasinghe, D. S., Sutha, J., & Perera, K. J. T. (2020). A Study of Factors Influences on Self-Directed Learning of Undergraduates (With Special Reference to Sri Lankan Universities). *Www.erepo.lib.uwu.ac.lk*. http://www.erepo.lib.uwu.ac.lk/handle/123456789/1731

Nyambe, H., Harsono, & Rahayu, G. R. (2016). Factors influence self-directed learning readiness of first, second and third years students at medical faculty of Hasanuddin University in PBL . *Indonesiyan Journal of Medical Education*, *5*(2), 67–77.

Oddi, L. F. (1986). Development and Validation of an Instrument to Identify Self-Directed Continuing Learners. *Adult Education Quarterly*, *36*(2), 97–107. https://doi.org/10.1177/0001848186036002004

O'Kell, S. (1988). A study of the relationships between learning style, readiness for self-directed learning and teaching preference of learner nurses in one health district. *Nurse Education Today*, *8*(4), 197–204. https://doi.org/10.1016/0260-6917(88)90149-9

O'Shea, E. (2003). Self-directed learning in nurse education: a review of the literature. *Journal of Advanced Nursing*, *43*(1), 62–70. https://doi.org/10.1046/j.1365-2648.2003.02673.x

Piratheeban, K. (2023, November). Unravelling the Nexus between Self-directed Learning Readiness and Academic Attainment: A Study on Student-Teachers in Sri Lanka. *Symposium Proceedings*. 3 rd

International Research Symposium - 2023, Colombo.

Ramli, N., Muljono, P., & Afendi, F. M. (2018). External Factors, Internal Factors and Self-Directed Learning Readiness. *Journal of Education and E-Learning Research*, *5*(1), 37–42. https://doi.org/10.20448/journal.509.2018.51.37.42

Slater, C. E., & Cusick, A. (2017). Factors related to self-directed learning readiness of students in health professional programs: A scoping review. *Nurse Education Today*, *52*, 28–33. https://doi.org/10.1016/j.nedt.2017.02.011

Vaičiūnienė, A., & Kazlauskienė, A. (2023). Liberating and Oppressive Factors for Self-Directed Learning: A Systematic Literature Review. *Education Sciences*, *13*(10), 1020. https://doi.org/10.3390/educsci13101020

Vandanah Gooria, Perienen Appavoo, Upasna Bhunjun, & Abheenaye Chauhan Gokhool. (2021). Self-directed Learning: Readiness of Secondary School Students in Mauritius. *Lecture Notes in Educational Technology*, 251–275. https://doi.org/10.1007/978-981-16-4099-5_13

Wiley, K. (1983). Effects of a Self-Directed Learning Project and Preference for Structure on Self-Directed Learning Readiness. *Nursing Research*, *32*(3), 181???185. https://doi.org/10.1097/00006199-198305000-00011

Wong, F. M. F., Tang, A. C. Y., & Cheng, W. L. S. (2021). Factors associated with self-directed learning among undergraduate nursing students: A systematic review. *Nurse Education Today*, *104*, 104998. https://doi.org/10.1016/j.nedt.2021.104998

Yang, C., Zhu, Y., Jiang, H., & Qu, B. (2021). Influencing factors of self-directed learning abilities of medical students of mainland China: a cross-sectional study. *BMJ Open*, *11*(10), e051590. https://doi.org/10.1136/bmjopen-2021-051590