The Seybold Report

ISSN 1533-9211

DOI 10.17605/OSF.IO/NJ4UG

STUDY OF SELF-DIRECTED LEARNING READINESS SCALES IN THE MALAYSIAN UNIVERSITY STUDENT CONTEXT: A REVIEW AND CRITICISM

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Abstract

Introduction: This study describes a theoretical framework to construct a self-directed learning readiness scale (SDLRS) that evaluates self-directed learning readiness. **Purpose:** To discuss the theoretical and empirical research required to develop a valid and consistent SDLRS in the Malaysian higher education context. **Design:** Quantitative research. **Method:** A convenience sample of 400 participants was enrolled. The factorial structure was evaluated with confirmatory and exploratory factor analyses and structural equation modelling. **Findings:** The findings demonstrated that self-directed learning was used at all higher education levels, from certificate to doctorate. Self-directed learning is also used across a wide range of courses and disciplines in both public and private settings and is currently universally accepted. The self-directed learning approach is widely accepted, given that it aids instructors and students in understanding and gaining learning and teaching advantages. Nevertheless, self-directed learning has limitations as optimisation requires time and teachers require higher expertise to control the learning environment. **Originality:** There is no dedicated instrument to assess Malaysian university students' demographic characteristics. Accordingly, a new Self-Directed Learning Readiness Scale was developed for the Malaysian context. **Research implication:** The SDLRS developed in this study will be useful for educators, administrators, and policymakers to understand Malaysian university students' self-directed learning readiness. **Funding statement:** The study was self-funded. **Ethical compliance:** Ethical approval was not required for this study as its primary aim was to aid students' learning by using the SDLRS and to assist lifelong learning. All procedures that included human participants conformed to University Tun Abdul Razak standards.

Keywords: Education, Higher Education, Learning Approach, Motivation, Performance, Self-Directed Learning Readiness Scale, Self-Efficacy, Support

JEL Classification:

INTRODUCTION

Education has become an economic resource that promotes national market, economic, and financial principles, which facilitate national cultural and social policymaking in education system restructuring based on globalisation and telecommunications technology advances

The Seybold Report
ISSN 1533-9211
DOI 10.17605/OSF.IO/NJ4UG

(Ahmed, 2017). This education system restructuring enables teachers and students to continuously acquire vital information and knowledge from substantial resources. Thus, students' self-directed learning capacity is the most significant aspect in establishing whether they will utilise telecommunication technology in their education (Wang, 2017; Henderson and Milstein, 2018).

Students can strengthen their analytical thinking abilities and use effective learning strategies in a supportive learning environment (Senouci, 2015). At the school level, numerous constructivist- and student-centred learning approaches are utilised in classrooms. Inquiry-based learning (IBL) is a constructivist strategy that promotes information acquisition via classroom questioning. Problem-based learning is another technique that aids students in building metacognitive capacity and knowledge skills, which allows them to implement self-regulated learning in the classroom (Nelson et al., 2019). Using inquiry tactics, a small student group can collaboratively solve challenges by using problem-based learning. Based on these aforementioned examples, it is essential for universities to include self-directed learning as a primary education component (Jia and Wang, 2019; Guglielmino, 2013; Kidane et al., 2020).

Self-directed learning involves excellent learning strategies that have received much attention and has become a greatly popular learning style among 21st-century educators (Tekkol and Demirel, 2018). The approach is also considered a crucial talent for students' futures as it prepares them for a competitive work market (Tekkol and Demirel, 2018). Furthermore, self-directed learning is widely considered the most efficient means of rendering educational activities more successful. These self-directed learning characteristics include the characteristics of diversity, continuity, activity, and interdisciplinary. Nonetheless, how self-directed learning is investigated is not well understood. This study was prompted by the need to present self-directed learning recommendations to the Malaysian higher education sector and was conducted based on the following questions:

a) What is the number of studies on self-directed learning methods in higher education?

b) How many studies on self-directed learning have been published in higher education fields?

c) What are the primary characteristics of self-directed learning publications?

METHODOLOGY

This study identified Malaysian research articles on self-directed learning published from 2008 to 2021, where the academic literature was searched based on self-directed learning readiness scales (SDLRS). The publications were not distinguished according to academic field or publishing period, or whether they were produced by research groups, individuals, or governmental or non-governmental agencies.

The relevant publications were identified by searching the Malaysian Citation Index database (https://mycite.mohe.gov.my/) (Malaysian Ministry of Higher Education, 2017) with the keyword 'self-directed learning'. The database contains science and technology articles written

ISSN 1533-9211

DOI 10.17605/OSF.IO/NJ4UG

by Malaysian researchers. The keyword search yielded 37 arts and humanities documents, 26 engineering and technology documents, and 71 social sciences documents. Classification of the papers based on the title and abstract criteria yielded 134 documents. Subsequently, summarisation of study characteristics yielded 75 documents that contained the most pertinent materials. Of the 75 documents, 59 contained information related to the study issues and were examined in-depth.

The 59 articles were evaluated in ascending order of quality based on the following criteria: (1) complete scientific paper layout; (2) paper structure contained an introduction, and methods, results, discussion, conclusions, and references sections; (3) clearly described application of self-directed learning alone or combined with other learning methods; and (4) provided theoretical and practical suggestions for self-directed learning. The data related to self-directed learning approaches were as follows: first, articles that were not related to education were eliminated. Second, education-relevant items were organised according to higher education level (undergraduate and graduate). The data were compiled into author or publication year, topic or discipline, data collection, study design, and key findings categories. Lastly, the articles were examined and categorised based on efficacy, knowledge and skill advancement, instructional quality improvement, professional skills, benefits, and drawbacks.

FINDINGS

Table I demonstrates that self-directed learning was most frequently used in diverse higher education scenarios and was applied and studied across all educational sectors. These education scenarios were demonstrated by the author and study year, discipline or topic, study design methodologies, study goals, data collection methods, and most importantly, the major conclusions.

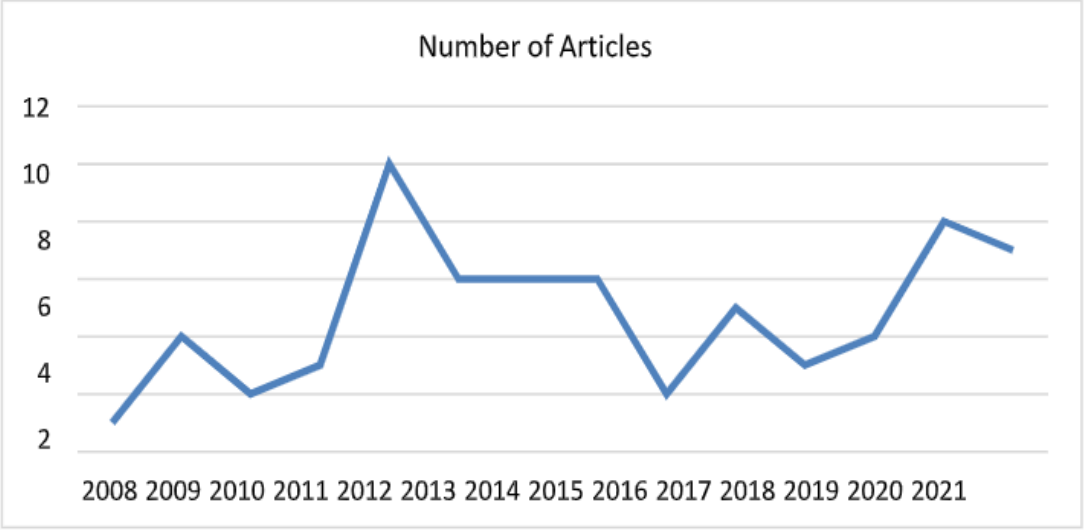

Figure 1: Quantity of Articles Published in 2008–2021

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ISSN 1533-9211
DOI 10.17605/OSF.IO/NJ4UG

Table 1: Characteristics of Articles and Key Findings

Author/Year	Topic/ Discipline	Study design	Aim	Data collection	Main findings
1. Chung et al. (2020a)	Online learning	experimenta lresearch	scientific discoveries to ensure all the classes continued as usual	Cross-sectional survey	there may be some drawbacks such as a lack of human touches such as sensing students' incomprehension through facial expressions, cracking small jokes to lighten the mood, and student engagement and interaction, which can be done more effectively
2. Chung et al. (2020b)	Students and professors at higher education institutions	Descriptive study	to achieve the objects of knowledge, attitude and the protection of the environment	Cross-sectional survey	Severely impacted by the unprecedented changes caused by the Covid-19 pandemic.
3. Kamarrudd in et al. (2014)	learning organization among lecturers	Conceptual analysis	Apply the method to organize the subject	Review	Relationship between self-directed learning, motivation to learn toward learning organization among lecturers at a selected public university in Malaysia
4. Hashim (2008)	Management and social subject of post-graduate student	Mixed method	Apply the method to learning management and social subject	Conceptual analysis and experiment	Competencies acquisition through self-directed learning among Malaysian managers
5. Nasri (2019)	Speaking skill of undergraduate students	Mixed method	Apply the method to teaching the presentation skills	Conceptual analysis and experiment	Self-directed learning through the eyes of teacher educators.
6. Saiboon et al. (2021)	performing critical emergency procedures among medical students in Malaysia	Mixed method	incorporates folk literature and implement a teaching theme	a single-blinded randomized controlled study	Effectiveness of self-directed small-group-learning against self-directed individual-learning using self-instructional-video
7. Ahmad and Majid (2010)	cultural instruction /undergraduat e	Theories analysis	How to apply the method to teach cultural	Review	Self-directed learning and culture: A study on Malay adult learners
8. Abdullah et al. (2008)	assignments written by undergraduate students	Autobio-grap hical narrative	develop a mindset of complex problem solving	based on the author's personal experiences	Adult participation in self-directed learning programs.

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ISSN 1533-9211
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9. Din et al. (2016)	Quality of life	Mixed method	Apply the method to measure quality of life	Theoretical analysis and Experiment	Can Self-directed Learning Environment Improve Quality of Life?
10. Hafit et al. (2021)	Technology Acceptance in Digital Learning	Mixed method	Apply the method to measure technology acceptance in digital learning	Indigenous Society in Malaysia	The Relationship Between Internet Self-Efficacy, Self-Directed Learning, and Motivation for Learning
11. Zainudin et al. (2019).	undergraduate	Conceptual analysis	Apply the method to teach biology	Review	to develop abilities to overcome the program's restrictions and widen their understanding of life collaborate to solve academic and practical problems
12. Chang et al. (2022)	Literature	Qualitative	reflects many current pedagogical viewpoints and contributes to the development of learner capacities	Case study	Self-directed learning readiness among nurses in Malaysia
13.Khan (2015)	Undergraduate students	Experiment	analyze and evaluate the effectiveness of the Self-Directed Learning project	A case from Malaysia	For the Students, By the Students'-An application of Self-Directed Learning

Figure 1 depicts the number of self-directed learning publications in Malaysian higher education over the past decade (2008–2021). Generally, the publication trend fluctuated within the 2008–2021 period. Specifically, one study was published in 2008, which indicated that self-directed learning was only recently studied in Malaysia. Subsequently, the number of self-directed learning publication increased to between two and four articles before peaking in 2012. Thereafter, the number of published articles decreased to six between 2013 and 2015, then decreased further to two articles in 2016. Seven and eight articles were published in 2020 and 2021, respectively, which indicated the growing trend of publications over the previous five years.

DISCUSSION

Self-directed learning is suitable for contemporary learning trends and is closely linked to various education methods and types. The contents of the examined articles ranged from certificate to post-graduate level. Furthermore, the articles generally represented diverse educational aspects, and learning specifically. The distinguishing characteristics of the articles were the significance of readiness for self-directed learning, the requirements of a SDLRS for Malaysian students, and the limitations of self-directed learning readiness measurements.

The importance of self-directed learning readiness

The significance of self-directed learning readiness continues to rise following the effects of the coronavirus disease 2019 (COVID-19) pandemic on the world, where many schools and

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ISSN 1533-9211
DOI 10.17605/OSF.IO/NJ4UG

universities closed. Consequently, many students and teachers shifted to online learning (Hussain and Al-Haddad, 2020). The shift to remote learning was described as a seismic shift in the education sector (Dell and Ertmer, 2019). In 2020, Malaysia implemented the Movement Control Order (MCO) to compress the distribution curve of COVID-19. All public and private universities in Malaysia restructured and conducted learning and teaching activities online (Malaysian Ministry of Higher Education, 2020), which was considered the best approach to ensure that all classes continued. The higher education academic fraternity demonstrated noteworthy adaptability, resilience, and proactiveness in addressing MCO-induced issues. In this regard, lessons, individual and group projects, assessments, and presentations were prepared and executed within two weeks utilising technology and virtual platforms.

Self-directed learning and motivation has been augmented based on each self-learner, where self-directed learning and student motivation are strongly related (Md. Yusoff, 2020). Students with self-directed learning skills demonstrate high persistence in their learning and increased online learning motivation. Nevertheless, students without such skills or who delay may encounter online learning barriers. These barriers would decrease the student's enthusiasm levels and they may not enthusiastically participate in online learning events. Accordingly, teachers must attain self-directed learning skills and be ready to conduct online classes (Sandars et al., 2020). Online learning is also subject to drawbacks, such as the inability to detect students' perplexity via their facial expressions, the absence of human touch, the inability to make jokes to improve students' moods, and reduced student interaction and engagement, which can be conducted more effectually in person (Chung et al., 2020a).

The extraordinary changes that stemmed from the COVID-19 pandemic substantially affected higher education teachers and students (Chung et al., 2020a). Students lacked social connections and were unable to join study groups, both of which were highly valued pre-pandemic. Additionally, unaccommodating home environments might have imperilled young people's learning opportunities (United Nations, 2020). To resolve these challenges, educational authorities must guarantee that a substantial number of learners have access to education. Therefore, teachers should have high-level decision-making independence when planning instructional activities and conditions. Thus, students' learning practices or "the advancement of pupils' educational trajectories" (Vanlommel et al., 2017) rely on teachers' assessments. Online learning has become a higher education lifeline, where technology can intensify self-directed learning by providing enduring self-directed learning outside the conventional classroom (Sajna and Anuroofa, 2017). Information and communication technologies (ICT) in education have increased substantially due to the disseminate of education globally, where ICT-enabled instrument availability has enhanced self-directed learning. Additionally, online learning, increased technological access, individualised learning experiences, and access to previously inaccessible information sources have developed the self-directed learning setting (Khan and Khan, 2020). Not all university communities are prepared for online learning, which requires both curricula digitalisation and students' readiness. Students who participate in online learning must possess high self-direction levels (Burkšaitiene and Šliogeriene, 2021). Fundamentally, students learn more efficiently when they regulate the course of their experiences or when self-directing their learning. Consequently,

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teachers highly value technology-based education, which includes hands-on training, technology-based education, student-centred education, lab-based education, and electronic learning. Teachers are also crucial in the self-directed learning environments of students, where teachers' continuous support and inspiration are essential to increase academic achievement and learning effectiveness (Sajna and Anuroofa, 2017).

The need for a Malaysian student-specific SDLRS

Self-directed learning has attracted the interest of many countries, which includes Malaysia. Therefore, a learning diagnostic tool that allows students to ascertain their strengths and limitations is important in self-directed learning. Given educators' significance in supporting students' self-directed learning, such a tool would enable educators to plan teaching strategies to aid students in overcoming their academic weaknesses (Goh and Lim, 2019). Currently, students' self-directed learning is measured with three SDLRS: the Guglielmino SDLRS (Guglielmino, 1977) the Fisher SDLRS (Fisher et al., 2001), and the Williamson Self-rated SDLRS (SSDLRS) (Williamson, 2007). Nonetheless, these instruments cannot be used in Malaysia due to demographic differences and no researcher has constructed an instrument to measure self-directed learning among Malaysian students. Moreover, the three aforementioned SDLRS cannot precisely forecast the relationship between academic performance and self-directed learning. Therefore, an appropriate instrument that measures Malaysian students' performance should be developed to bridge this gap. It is also vital for Malaysia to possess an instrument that aids stakeholders in determining students' self-directed learning performance. Such an instrument would enable stakeholders to make better decisions and take beneficial action, which would be advantage for the Malaysian education system and government in the future.

LIMITATIONS OF CURRENT SDLRS

The Guglielmino SDLRS (Guglielmino, 1977) is used to determine whether a person has the right attitude, skills, and abilities to learn independently. Nevertheless, the validity of the Guglielmino SDLRS has been questioned. Specifically, it was argued that the Guglielmino SDLRS does not precisely measure the self-directed learning readiness construct (Hou et al., 2018; See et al., 2014). Hou et al. (2018) reported that the Self-Directed Learning Readiness Scale was a valid measure of self-directed learning readiness among Taiwanese high school students. Given that the subscales demonstrated low internal consistency, they were required to have discriminant validity. See et al. (2014) examined 11 studies using Guglielmino SDLRS and reported that the scale did not measure self-directed learning readiness satisfactorily and required modification to do so. Xu and Wang (2018) reported that the Guglielmino SDLRS demonstrated low internal consistency, where the Chinese and English versions of the scale yielded Cronbach's alpha values of 0.50 and 0.51, respectively.

Second, new research suggested that the Guglielmino SDLRS may not be a good means of measuring self-directed learning readiness in groups from different cultural backgrounds (Ancheta, 2020; Behar-Horenstein et al., 2018). Specifically, the scale might not accurately measure how non-Western students' backgrounds and experiences differ from one another

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culturally. This finding was supported by Ancheta (2020), who suggested that the scale might not be a good means of measuring self-directed learning among students from the Philippines.

Third, recent research suggested that the Guglielmino SDLRS lacked an explicit theoretical framework to conduct self-directed learning readiness measurement (Pang et al., 2019). Another area for improvement is the need for a standardised approach to interpret scale scores (Riabov et al., 2020). Additionally, recent research demonstrated that Guglielmino SDLRS may not be sufficiently sensitive to measure self-directed learning readiness changes over time (Prusty et al., 2020). It was suggested that "Guglielmino's SDLRS should no longer be used to measure self-directed learning readiness" (Lachowetz and O'Dwyer, 2018). The authors argued that the scale does not accurately measure self-directed learning readiness and that other measures should be used instead.

Acknowledging these issues, Fisher et al. (2001) developed and evaluated a SDLRS using factor analysis. The Fisher SDLRS is free as the developers were prepared to share it with other researchers to resolve the cost restrictions of the Guglielmino SDLRS (Guglielmino, 1977). Nonetheless, recent studies identified several potential limitations of the Fisher SDLRS. First, it lacks evidence regarding its reliability and validity (Liao and Tsai, 2017; Ting and Tsai, 2017; Wang, 2018; Xiao and Yang, 2015). Therefore, the Fisher SDLRS validity and reliability must be tested, where alternative measures and research methods can be used to assess student preparedness for self-directed learning more accurately. These measures include interviews, surveys, questionnaires, and tests. Additionally, the validity and reliability of the Fisher SDLRS can be investigated further with qualitative and quantitative analyses, structural equation modeling, and predictive analytics research methods. Smith (2017) concluded that the Fisher SDLRS was an excellent means of determining whether a student was ready for self-directed learning but required more accuracy.

Second, the Fisher SDLRS consists of the dimensions goal setting, self-efficacy, resource management, and learning strategies, which are not well measured (Ting and Tsai, 2017; Wang, 2018; Xiao and Yang, 2015). Unsuitable measures can present teachers with insufficient information to accurately evaluate whether a student is ready for self-directed learning. Consequently, students' needs might be underestimated and inadequate educational strategies might be implemented (Wang, 2018). Furthermore, the absence of assessment measures will result in a lack of feedback to teachers, which would render it challenging for them to determine whether their teaching strategies are effective (Ting and Tsai, 2017). Additionally, the lack of assessment measures can render it more challenging to establish which strategies yield the best results for different types of learners (Xiao and Yang, 2015). Ultimately, this can be detrimental to students' learning outcomes.

Third, in addition to the need for adequate measures, additional factors that might influence self-directed learning readiness should be considered (Xiao and Yang, 2015), such as prior experience, background knowledge, and sociocultural context. Thus, the available evaluation tools should focus more on these factors and consider their effects. Finally, a systematic approach is needed to assess the Fisher SDLRS (Ting and Tsai, 2017). The current assessment tools are frequently expedient and lack a consistently structured approach. Therefore, the

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ISSN 1533-9211
DOI 10.17605/OSF.IO/NJ4UG

Learning Readiness Scale could be more reliable and consistent, which can yield results that do not require correction or supplementation. Recent research identified several limitations to the Williamson SSDLRS (Williamson, 2007). Spitzer et al. (2018) demonstrated that the SSDLRS is not a satisfactory means of measuring how culture and society affect students' abilities to learn independently. Assessment tools must be tested in diverse groups as people from different backgrounds may have different learning expectations and experiences. González-Hernández (2020) reported that cultural and social factors significantly affected students' autonomy, self-efficacy, and motivation. Furthermore, Sparks and Louw (2019) stated that testing an instrument with various types of students would enable the determination of how well it matches the students' experiences and expectations. For example, students from lower socioeconomic backgrounds may have less access to educational resources and may be unprepared to attend school. Thus, cultural differences may lead to different learning approaches (Sparks and Louw, 2019).

The Williamson SSDLRS also does not consider the learning environment or available resources (Brown, 2018; Bouhnik et al., 2020). Brown (2018) stated that the Williamson scale "fails to capture the essential aspects of the learner's environment and the effect of technology on self-directed learning". Bouhnik et al. (2020) stated that a measure other than the Williamson scale might be suitable for online learning, given that the Williamson scale does not consider the resources available to the learner when evaluating whether they are suited to online learning. Therefore, a more appropriate scale should examine the student's learning environment and tools.

CONCLUSION

A learning diagnostic tool that allows students to understand their self-directed learning strengths and flaws is crucial. Such a tool would enable educators to organise their teaching strategies to aid students in overcoming their deficiencies, as educators are critical in supporting self-directed learning. Furthermore, responding to the SDLRS items would enable students to gain a clearer understanding of their self-directed learning behaviour and the key elements that influence their learning process. The students would also be able to identify their strengths and limitations and choose the suitable strategies to develop self-directed learning skills. Lastly, teachers would be able to construct 'smart' instructional materials with care and sensitivity and assist pupils in expending deliberate efforts toward self-improvement.

References

1. Abdullah, M.M.B., Koren, S.F., Muniapan, B., Parasuraman, B. and Rathakrishnan, B. (2008), "Adult participation in self-directed learning programs", International Education Studies, Vol. 1 No. 3, pp.66-72. http://doi.org/10.5539/ies.v1n3p66
2. Ahmad, B.E. and Majid, F.A. (2010), "Self-directed learning and culture: A study on Malay adult learners", Procedia-Social and Behavioral Sciences, Vol. 7, pp.254-263. https://doi.org/10.1016/j.sbspro.2010.10.036
3. Ahmed, M. (2017), Education and Globalization: Implications for Education Policy, Access and Quality, Routledge. https://doi.org/10.4324/9781315621702

The Seybold Report
ISSN 1533-9211
DOI 10.17605/OSF.IO/NJ4UG

4. Ancheta, M. (2020), "Cultural issues with Guglielmino's self-directed learning readiness scale", International Journal of Learning, Teaching and Educational Research, Vol. 19 No. 2, pp.19-25. https://doi.org/ 10.26803/ijlter.19.2.2
5. Behar-Horenstein, L.S., Beck, D.E. and Su, Y. (2018), "An initial validation study of the self-rating scale of self-directed learning for pharmacy education", American Journal of Pharmaceutical Education, Vol. 82 No. 3, pp.280-286.
6. Bouhnik, D., Kuflik, T. and Shoham, Y. (2020), "Exploring self-directed learning readiness in online learning contexts", British Journal of Educational Technology, Vol. 51 No. 2, pp.608-622. https://doi.org/ 10.1111/bjet.1300
7. Brown, K. (2018), "Exploring self-directed learning readiness in a blended learning environment", International Journal of Educational Technology in Higher Education, Vol. 15 No. 1. https://doi.org/ 10.1186/s41239-018-0091-2
8. Burkšaitiene, N. and Šliogeriene, J. (2021), "Lithuanian undergraduate students' approaches to learning English for Specific Purposes", Journal of Education Culture and Society, Vol. 12, pp.469–477. https://doi.org/10.15503/jecs2021.1.469.477
9. Chang, W.C., Jun, E.E., Souriappan, E.S., Kanagasundram, N. and Mani, S. (2022), "Self-directed learning readiness among nurses in Malaysia", REAL in Nursing Journal, Vol. 5 No. 1, pp. 1-7. http://doi.org/10.32883/rnj.v5i1.1651
10. Chung, E., Noor, N.M. and Mathew, V.N. (2020a), "Are you ready? An assessment of online learning readiness among university students", International Journal of Academic Research in Progressive Education and Development, Vol. 9 No.1, pp.301–317. https://doi.org/10.6007/IJARPED/v9-i1/7128
11. Chung, E., Subramaniam, G. and Dass, L.C. (2020b), "Online learning readiness among university students in Malaysia amidst COVID-19", Asian Journal of University Education, Vol. 16 No. 2, pp.46-58. https://doi.org/10.24191/ajue.v16i2.10294
12. Dell, B.G. and Ertmer, P.A. (2019), "Reframing the challenges of the digital divide: Redefining equity, access, and the role of technology in education", Educational Technology Research and Development, Vol. 67 No. 5, pp.1583–1595. https://doi.org/10.1007/s11423-019-09710-2
13. Din, N., Haron, S. and Rashid, R.M. (2016), "Can self-directed learning environment improve quality of life? Procedia-Social and Behavioral Sciences, Vol. 222, pp.219-227. https://doi.org/ 10.1016/j.sbspro.2016.05.034
14. Fisher, M., King, J. and Tague, G. (2001), "Development of a self-directed learning readiness scale for nursing education", Nurse Education Today, Vol. 21 No. 7, pp.516-525. https://doi.org/10.1054/nedt.2001.0589
15. Goh, C.H. and Lim, J.Y. (2019), "Supporting self-directed learning in higher education: A review of the literature", Studies in Higher Education, Vol. 44 No. 4, pp. 751-767. https://doi.org/10.1080/03075079.2016.1209627
16. González-Hernández, G. (2020), "Cultural and social factors influencing students' autonomy, self-efficacy, and motivation", Frontiers in Psychology, Vol. 11, p. 538. https://doi.org/10.3389/fpsyg.2020.00538
17. Guglielmino, L.M. (1977), "Development of the Self-Directed Learning Readiness Scale", Doctoral dissertation, University of Georgia, Athens, available at: http://psycnet.apa.org/psycinfo/1979-14573-001
18. Guglielmino, L.M. (2013), "The case for promoting self-directed learning in formal educational institutions", South African Education Journal, Vol. 10 No. 2, pp.1-18. https://doi.org/10.1080/02568540.2013.10597563
19. Hafit, N.I.A., Anis, A., Shuhaime, N.L.S. and Miah, M.M. (2021), "The relationship between internet self-

The Seybold Report
ISSN 1533-9211
DOI 10.17605/OSF.IO/NJ4UG

efficacy, self-directed learning, and motivation for learning towards technology acceptance in digital learning among indigenous society in Malaysia", International Journal of Advanced Research in Education and Society, Vol. 3 No. 1, pp.142-150. https://doi.org/10.29333/ijares/v3i1.83

20. Hashim, J. (2008), "Competencies acquisition through self-directed learning among Malaysian managers", Journal of Workplace Learning, Vol. 20 No. 4, pp.259-271. https://doi.org/10.1108/13665620810871114
21. Henderson, M. and Milstein, M. (2018), "The impact of technology on self-directed learning", International Journal of Instruction, Vol. 11 No. 3, pp.41-52. https://doi: 10.12973/iji.2018.113a3
22. Hou, C.Y., Chen, Y.T. and Hwang, Y.S. (2018), "Examining the validity of Guglielmino's self-directed learning readiness scale for Taiwanese high school students", International Journal of Science and Mathematics Education, Vol. 16 No. 8, pp.1835–1849. https://doi: 10.1007/s10763-017-9810-7
23. Hussain, J. and Al-Haddad, S. (2020), "Self-directed learning readiness during the Covid-19 pandemic", International Journal of Educational Technology in Higher Education, Vol. 17 No. 1, pp.1-9. https://doi.org/10.1186/s41239-020-00180-8
24. Jia, Y. and Wang, Y. (2019), "The role of self-directed learning in university teaching", Higher Education, Vol. 78 No. 3, pp.517-531. https://doi.org/10.1007/s10734-018-0286-6
25. Kamarruddin, N., Abiddin, N.Z. and Idris, K. (2014), "Relationship between self-directed learning, motivation to learn toward learning organization among lecturers at a selected public university in Malaysia", International Journal of Education Vol. 8 No. 1, pp.23-35. https://doi.org/10.17509/IJE.V8I1.1766
26. Khan, G. (2015). "For the students, by the students'-An application of self-directed learning: A case from Malaysia", Academy of Marketing Conference 2015: The Magic in Marketing (pp. 1-12).
27. Khan, G.M.A. and Khan, M.A. (2020), "Impact of information and communication technology (ICT) on self-directed learning," International Journal of Information and Education Technology, Vol. 10 No. 7, pp.658-662. https://doi.org/10.18178/ijiet.2020.10.7.1241
28. Kidane, H.H., Roebertsen, H. and van der Vleuten, C.P. (2020), "Students' perceptions towards self-directed learning in Ethiopian medical schools with new innovative curriculum: A mixed-method study", BMC Medical Education, Vol. 20 No.1, pp.1-10. https://doi.org/10.1186/s12909-019-1924-0
29. Lachowetz, T. and O'Dwyer, M. (2018), "The use of Guglielmino's self-directed learning readiness scale in today's higher education classroom", International Journal for the Scholarship of Teaching and Learning, Vol. 12 No. 2, pp.1-15. https://doi.org/10.20429/ijsotl.2018.120213
30. Liao, Y.S. and Tsai, S.Y. (2017), "An assessment of self-directed learning readiness in college students: A study based on the Fisher self-directed learning readiness scale", International Education Studies, Vol. 10 No. 7, pp.91–103. https://doi.org/10.5539/ies.v10n7p91
31. Malaysian Ministry of Higher Education (2017), "Ministry of Higher Education: Number of higher education institutions by types (as in 2015)", available at: https://mycite.gov.my/. https://doi.org/10.1080/10508400.2017.1396923
32. Malaysian Ministry of Higher Education (2020), "Press release by the Malaysian Ministry of Higher Education", available at: https://www.nst.com.my/education/. https://doi.org/10.1080/10508400.2020.1793231
33. Md. Yusoff, S. (2020), "The relationship between self-directed learning and motivation among Malaysian undergraduate students", Review of Educational Research, Vol. 90 No. 4, pp. 545–572. https://doi.org/10.1007/s11144-020-01163-0
34. Nasri, N.M. (2019), "Self-directed learning through the eyes of teacher educators", Kasetsart Journal of Social Sciences, Vol. 40 No. 1, pp.164-171.

The Seybold Report
ISSN 1533-9211
DOI 10.17605/OSF.IO/NJ4UG

35. Nelson, L.C., Smith, J.K. and Radford, A.L. (2019), "Teaching self-regulation through problem-based learning: A case study", Thinking Skills and Creativity, Vol. 31, 100295. https://doi.org/10.1016/j.tsc.2019.100295

36. Pang, F., Zhang, L., Fan, X., Wang, M. and Liu, P. (2019), "Exploring the psychometric properties of the Guglielmino self-directed learning readiness scale in a Chinese context", Frontiers in Psychology, Vol. 10, 1567. https://doi.org/10.3389/fpsyg.2019.01567

37. Prusty, M., Lai, Y.Y., Srivastava, S., Mahto, N. and Singh, M. (2020), "Evaluation of the validity and reliability of Guglielmino's self-directed learning readiness scale", International Journal of Scientific Research and Education, Vol. 8 No. 7, pp.2439-2445. https://doi.org/10.18535/ijsre/v8i7.03

38. Riabov, O., Derks, S. and van der Kloet, L. (2020), "Psychometric properties of the Guglielmino self-directed learning readiness scale: A systematic review", Educational Psychology Review, Vol. 32 No. 4, pp.717–742. https://doi.org/10.1007/s10648-020-09469-z

39. Saiboon, I.M., Musni, N., Daud, N., Shamsuddin, N.S., Jaafar, M.J., Hamzah, F.A. and Bakar, A.A. (2021), "Effectiveness of self-directed small-group-learning against self-directed individual-learning using self-instructional-video in performing critical emergency procedures among medical students in Malaysia: A single-blinded randomized controlled study", Clinical Simulation in Nursing, Vol. 56, pp.46-56. https://doi.org/10.1016/j.ecns.2021.02.006

40. Sajna, J. and Anuroofa, O.M. (2017), "A study on the relationship between self-directed learning and achievement in information technology of students at secondary level", Universal Journal of Educational Research, Vol. 5 No. 10, pp.1849-1852. https://doi.org/10.13189/ujer.2017.051024

41. Sandars, J., Correia, R., Dankbaar, M., de Jong, P., Goh, P.S., Hege, I., Masters, K., Oh, S.Y., Patel, R., Premkumar, K., Webb, A. and Pusic, M. (2020), "Twelve tips for rapidly migrating to online learning during the COVID-19 pandemic", MedEdPublish, Vol. 9 No. 1, p.82. https://doi.org/10.15694/mep.2020.000082.1

42. See, P.J., Chai, C.S., Neo, M., Goh, Y.S. and Chong, S.M. (2014), "The construct validity of Guglielmino's self-directed learning readiness scale: A meta-analysis. Research and Practice in Technology Enhanced Learning, Vol. 9 No. 3, pp.281–291. https://doi.org/10.1186/s41039-014-0003-2

43. Senouci, A. (2015), "The Impact of Globalization on Education", Doctoral dissertation, University of Tlemcen, Algeria, available at: https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=a0e3358969000382245bd32e410b50ad1d766ba4

44. Smith, G. (2017), "An evaluation of the Fisher self-directed learning readiness scale", Education Research and Perspectives, Vol. 44 No. 2, pp.1-14. https://doi.org/ 10.18848/2201-6333/CGP/v44i02/1-14

45. Sparks, B. and Louw, M. (2019), "Exploring the limitations of the self-directed learning readiness scale in a South African context", South African Journal of Higher Education, Vol. 33 No. 2, pp.27-41. https//doi.org/10.20853/33-2-1270

46. Spitzer, K.M., Czerniak, C.M. and Stuhlman, M.W. (2018), "Assessing self-directed learning readiness: Examining the influence of cultural and social contexts", Education Research International, Vol. 2018, pp.1-14. https://doi.org/10.1155/2018/7690362

47. Tekkol, İ.A. and Demirel, M. (2018), "An investigation of self-directed learning skills of undergraduate students", Frontiers in Psychology, p.2324. https://doi.org/10.3389/fpsyg.2018.02324

48. Ting, T.H. and Tsai, S.Y. (2017), "A study of the Fisher self-directed learning readiness scale among college students in Taiwan", International Education Studies, Vol. 10 No. 7, pp.73–82. https://doi.org/ 10.5539/ies.v10n7p73

49. United Nations. (2020), "Growing up in an Urban World", available at:

The Seybold Report
ISSN 1533-9211
DOI 10.17605/OSF.IO/NJ4UG

https://www.unicef.org/publications/files/Growing_Up_in_an_Urban_World.pdf

50. Vanlommel, K., Van Gasse, R., Vanhoof, J. and Van Petegem, P. (2017), "Teachers' decision-making: Data based or intuition driven? International Journal of Educational Research, Vol. 83, pp.75-83. https://doi.org/10.1016/j.ijer.2017.02.013
51. Wang, L. (2017), "Self-directed learning and the use of telecommunications technology in middle school education", Journal of Educational Technology & Society, Vol. 20 No. 3, pp.252-261. https://doi: 10.18848/1436-4522/CGP/v20i03/252-261
52. Wang, Y.H. (2018), "A study of self-directed learning readiness among college students in Taiwan", International Education Studies, Vol. 11 No. 5, pp.1–7. https://doi.org/ 10.5539/ies.v11n5p1
53. Williamson, S.N. (2007), "Development of self-rating scale of self-directed learning", Nurse Researcher, Vol. 14 No. 2, pp.66-83. https://doi.org/10.7748/nr2007.01.14.2.66.c6022
54. Xiao, Y. and Yang, Y. (2015), "Self-directed learning readiness among college students: A study based on the Fisher self-directed learning readiness scale", International Education Studies, Vol. 8 No. 5, pp.54–64. https://doi.org/ 10.5539/ies.v8n5p54
55. Xu, D. and Wang, P. (2018), "An exploratory study of the reliability and validity of the Chinese version for Guglielmino's self-directed learning readiness scale", Educational Psychology, Vol. 38 No. 5, pp.664-676. https://doi.org/ 10.1080/01443410.2017.1360720
56. Zainudin, A.A., Ahmad, N. and Mohadis, H.M. (2019), "Challenges of self-directed clinical skill learning: Experience among undergraduate nursing students in Malaysia", Universal Journal of Educational Research, Vol. 7 No. 12A, pp.60-67. https://doi.org/10.13189/ujer.2019.071908