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Perceived readiness for self-directed e-learning in undergraduate physiotherapy education: Insights for future curriculum development

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Background. Self-directed learning (SDL) is an essential competency for health sciences students, particularly as higher education increasingly integrates blended- and e-learning approaches. In South Africa where students enter tertiary education from diverse socioeconomic and educational backgrounds, the readiness of physiotherapy students to engage in SDL within e-learning environments remains underexplored.
Objectives. To investigate the perceived readiness of undergraduate physiotherapy students to participate in self-directed e-learning at a South African tertiary institution.
Methods. A descriptive, cross-sectional study was conducted among first- to fourth-year physiotherapy students (*N*=217). Participants voluntarily completed the UniSIM questionnaire, a validated tool assessing 10 SDL readiness domains. Responses were rated on a 7-point Likert scale, with descriptive statistics used for analysis.
Results. A total of 94 students (43%) completed the questionnaire. Most reported readiness in key SDL areas, including motivation and planning (85.80%), comprehension competence (95.45%), time management (79.17%) and online learning proficiency (72.27%). However, only 52.27% felt confident managing tests and examinations, and 71.82% reported difficulty managing stress. Despite overall readiness for SDL, 76.89% preferred guided learning formats, such as lectures.
Conclusion. Undergraduate physiotherapy students demonstrated overall readiness for self-directed e-learning, particularly in areas critical for academic autonomy. However, stress management emerged as a notable barrier, and the preference for guided instruction suggests a need for structured support. Future initiatives should incorporate strategies to strengthen emotional resilience and gradually foster SDL competencies across all years of study.

Keywords: self-directed learning, physiotherapy students, e-learning, digital competence, learner autonomy, perceived readiness, online education, learning readiness

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Self-directed, lifelong learning is a critical competence for healthcare students to develop during their undergraduate studies.[1] This competency not only enhances individual knowledge and skills, but also contributes to improved healthcare service delivery and interdisciplinary collaboration.[2] In physiotherapy, a profession focused on optimising movement and function across the lifespan, students are required to gain proficiency in a range of clinical areas over a 4-year period.[3] One of the areas in which physiotherapy students are required to gain proficiency is paediatrics. In the curriculum, the paediatrics module spans all 4 years of study, ensuring the gradual building of knowledge and clinical skills.[3] As students progress through the curriculum, they are continually challenged to integrate theory with practice, which creates meaningful opportunities to develop the habits of inquiry, reflection and adaptability that underpin lifelong learning.[4,5] One way to cultivate lifelong learning is through the promotion of self-directed learning (SDL).[6] SDL involves setting personal learning goals, identifying resources, implementing strategies and evaluating outcomes, all of which are metacognitive skills vital for future healthcare professionals.[7]

Although SDL has gained traction in health professions education, there is limited literature on its implementation in the early years of undergraduate health sciences training, particularly in physiotherapy.[8] The shift to blended learning and e-learning, accelerated by the COVID-19 pandemic, has further emphasised the need for students to engage with teaching materials and content independently.[9] South African (SA) higher education institutions now commonly utilise digital platforms and e-learning pedagogies, encouraging students to adopt SDL approaches.[10] However, many South African students entering tertiary education have previously been exposed to more structured, guided learning environments during their primary and secondary schooling. As a result, transitioning to self-directed e-learning may pose challenges, particularly for those with limited digital literacy or access.[11] This highlights the importance of designing SDL opportunities that not only support autonomy and motivation, but also address varying levels of technological readiness.

Despite growing interest in blended learning and digital e-learning pedagogies, little is known about the readiness of SA undergraduate physiotherapy students to engage in self-directed e-learning.[12] Given the country's diverse socioeconomic and educational landscape, understanding students' perceptions of their readiness becomes paramount. This study therefore aimed to explore the perceived readiness of undergraduate physiotherapy students to participate in self-directed e-learning with the intention of informing future curriculum improvements. Insights gained may inform curriculum design and support strategies to better facilitate students' transition into autonomous, technology-enhanced learning environments.

Methods

A descriptive, observational, cross-sectional study was conducted among first- to fourth- year physiotherapy students at a tertiary institution in SA.[13] Students in the physiotherapy department were selected as they were from diverse socioeconomic backgrounds. All registered physiotherapy students, at any level of study, were recruited for participation in the study (*N*=217). The authors considered a 40% completion rate of the questionnaire to be satisfactory.[14]

Participants in the study were recruited from the physiotherapy department through in-person engagements and posters displayed in the department. No incentives were offered, but two emails and multiple WhatsApp reminders were sent to students via class representatives. The potential for response bias exists with this recruitment method, as students more interested in SDL or digital learning may have been more likely to participate. Interested participants were asked to scan a QR code, which provided them access to information about the study and an informed consent document. Once the completed consent documents were received, participants received a link to the questionnaire. Data collection was conducted over a period of 4 months (July - October 2024) to allow sufficient time for participants to complete the questionnaire. The study received ethical approval from the institutional research and ethics committee (ref. no. 264/2024).The UniSIM questionnaire (Supplementary Materials 1) was used to assess students' perceived readiness for self-directed e-learning.[15] The questionnaire was specifically selected for its focus on e-learning and for allowing comparison between online and didactic teaching preferences and readiness. The UniSIM questionnaire consisted of 70 questions, which were grouped according to factors that are essential for self-directed e-learning, i.e. online learning proficiency; assignment management, stress management, technical proficiency, procrastination, comprehension competence, online discussion proficiency, assessment management, time management, and motivation and planning. Questions were phrased as negative and positive statements (e.g. I do not know/I cannot vs. I know/I can) to reduce the likelihood of participants selecting a single response type throughout, therefore encouraging more thoughtful and accurate answers. Participants responded to statements by selecting options on a 7-point Likert scale, where 1 indicated 'strongly disagree' and 7 indicated 'strongly agree'. Data analysis was conducted using descriptive statistics. Cronbach's alpha for the UniSIM tool in this sample was calculated and found to be 0.88, indicating strong internal consistency.

Results

The response rate for the 217 physiotherapy students was 43% (*n*=94), of whom five (5.13%) were male students and 89 (94.67%) were females. All participants completed all questions of the questionnaire, and all data were included in the final analysis. The majority of participants were in their first year of study (*n*=38; 40.43%), followed by second year (*n*=26; 27.66%), third year (*n*=19; 20.21%) and final year (*n*=11; 11.70%). Third- and final-year students were engaged in clinical rotations during the data collection period, which may have limited their participation.

Figs 1 and 2 indicate results for each group factor on the UniSIM questionnaire for the total sample (*n*=94). Positive and negative statements

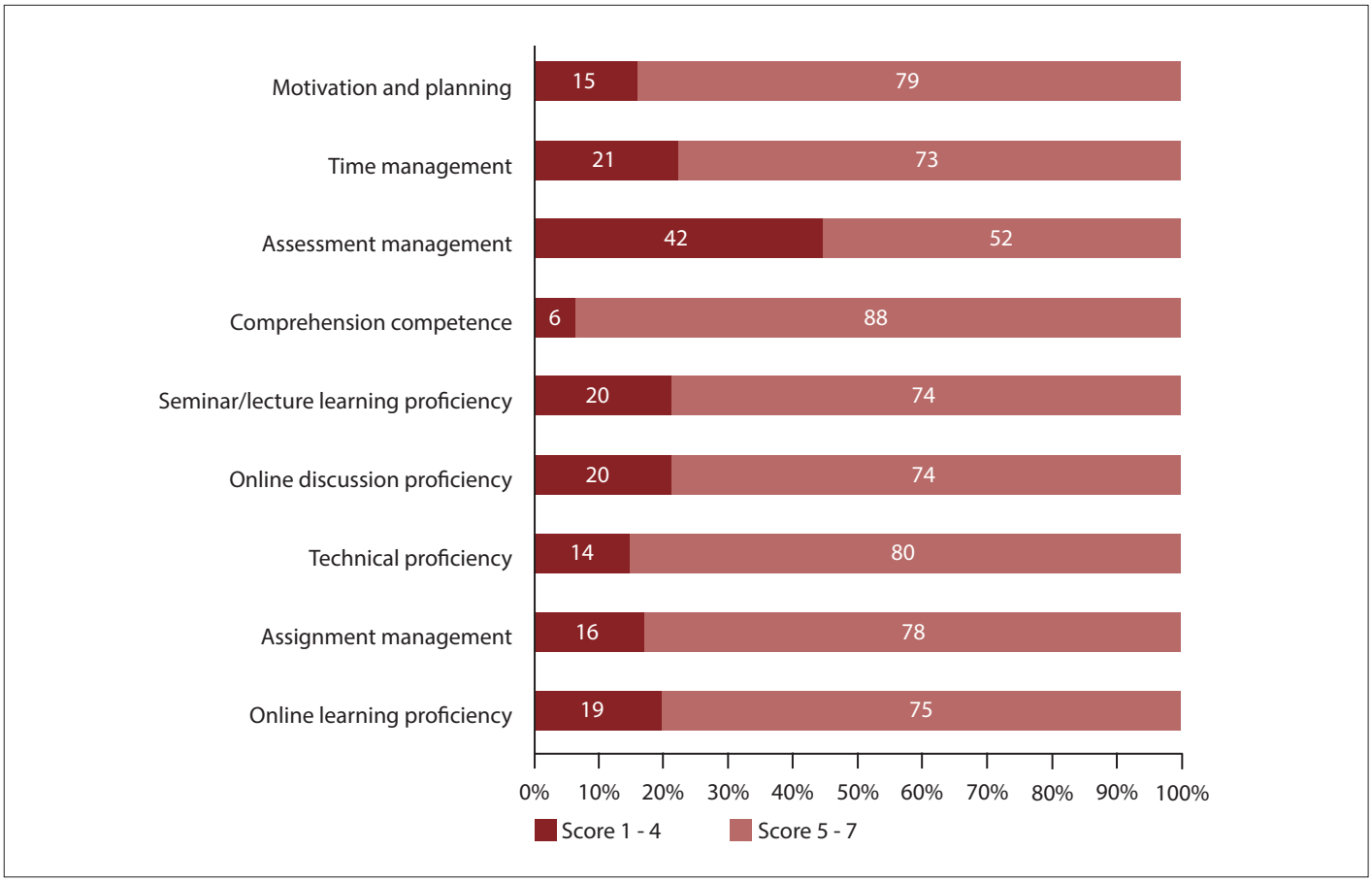

Fig. 1. Participants' perceived readiness for participation in self-directed e-learning: positive statements.

are presented separately: positive Likert scale items were considered 'good' if the participants selected 5, 6 or 7 (agree to strongly agree), while negative Likert scale items were considered 'good' if participants selected 1, 2, 3 or 4 (strongly disagree to neutral).

Most participants reported the ability to learn autonomously, as they indicated that they possess sufficient motivation and planning skills (85.80%); are competent in comprehending materials (95.45%); can manage their time well (79.17%); and can limit procrastination (68.89%). Regarding their e-learning abilities, most participants indicated that they are proficient in online learning (72.27%); technical competencies associated with online learning (81.82%); and the ability to participate in online discussions (64.44%). The majority of participants also reported that they managed assessment scenarios well, as most managed assignments competently (83.12%). Interestingly, slightly over half of the participants (52.27%) indicated that they can manage tests and examinations competently. Stress management among students was also a concern, as 71.82% indicated that they do not possess the ability to manage stress effectively.

Although the results from this survey are positive indicators that students are ready for e-learning, a large number (76.89%) reported that they are more proficient with guided learning presented in the form of lectures.

Additional statistical analysis was conducted to determine whether there were differences between students in different levels of study (Supplementary Materials 2). A summary of the Kruskal-Wallis test for composite scores is presented in Table 1.

The comparative analysis across year levels revealed that differences in SDL-related competencies were not uniform, with significant variation confined to a subset of domains. Senior students demonstrated stronger abilities in assignment management, online discussion proficiency, comprehension competence and assessment management, particularly in negatively phrased items, suggesting that these skills consolidate progressively across the programme. The absence of differences in online learning proficiency (positive items) further suggests that baseline familiarity with digital learning environments is consistent across the cohort, while the significant differences in negatively phrased online learning and technical proficiency items point to reduced difficulties among senior students. Collectively, these findings highlight that while some SDL competencies naturally improve with experience, others require explicit curricular scaffolding to ensure development across all levels of study.

Discussion

This study explored SA undergraduate physiotherapy students' readiness to participate in self-directed e-learning. The results revealed that most students perceived themselves as capable and ready for participation across several domains associated with SDL. Key competencies such as motivation and planning, time management, comprehension skills and online learning proficiency were rated positively by the majority of participants, indicating an encouraging level of readiness for engaging in autonomous, technology-enhanced learning.[16-18]

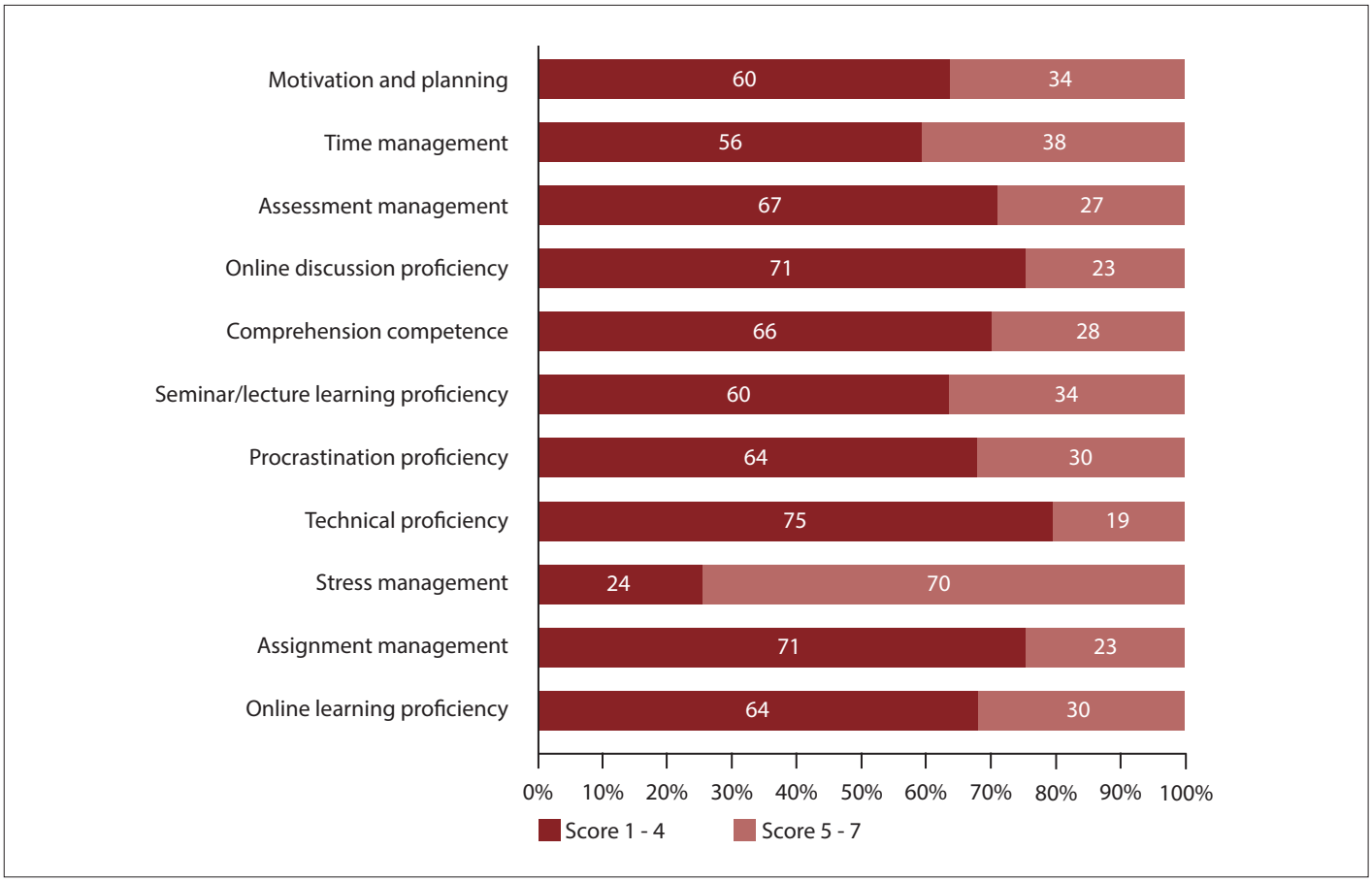

Fig. 2. Participants' perceived readiness for participation in self-directed e-learning: negative statements.

Table 1. Kruskal-Wallis analysis for composite scores per category

Category	Statement type	H	*p*-value
Assignment management	Positive	12.975	0.004*
	Negative	33.710	<0.001*
Online learning proficiency	Positive	0.592	0.898
	Negative	18.549	<0.001*
Stress management	Negative	0.658	0.607
Technical proficiency	Positive	0.271	0.965
	Negative	9.512	0.023*
Procrastination management	Negative	3.809	0.283
Online discussion proficiency	Positive	5.599	0.133
	Negative	20.596	<0.001*
Seminar/lecture learning proficiency	Positive	0.033	0.998
	Negative	4.698	0.195
Comprehension competence	Positive	0.119	0.989
	Negative	8.147	0.043*
Assessment management	Positive	1.359	0.715
	Negative	16.697	<0.001*
Time management	Positive	0.312	0.958
	Negative	3.157	0.368
Motivation and planning	Positive	0.328	0.955
	Negative	5.651	0.129

*$p<0.05$ denotes statistical significance.

The majority of students also reported adequate comprehension, motivation and assignment management skills, which aligns with international literature suggesting that health sciences students increasingly demonstrate readiness for SDL, particularly when curricula are intentionally scaffolded to develop these skills over time.[1,7,9] Education practices that are implemented in health sciences courses not only have to ensure that the fundamental knowledge of the field is conveyed and highlighted to students but also have to ensure that the knowledge that is gained can be implemented practically in various environments and contexts.[19] The fact that the final-year students in this study had the lowest response rate may suggest that students' academic and clinical workload may limit their capacity to engage in voluntary online activities such as surveys or SDL modules. This finding reinforces the importance of integrating SDL into formal curricular activities rather than treating it as an optional educational adjunct.

The high preference for guided instruction reported by 76.89% of participants suggests that while students may possess the underlying competencies for SDL participation, they continue to value structured learning experiences, particularly in the earlier years of training. This duality has been noted in previous studies, which emphasise the need to gradually transition students from lecturer-led instruction to more independent learning models.[6,10] The incorporation of self-directed, blended and e-learning strategies might pose a further challenge, as not all students may have had similar secondary training or access to technological resources.[20,21] Students engaged in e-learning successfully attain the objectives and outcomes of their learning modules, and report a positive experience with the online learning environment.[22,23] The development of online learning strategies and purposeful student preparation forms a critical part of the success attributed to the SDL educational method.[24,25]

The findings from this study reinforce the need for physiotherapy curricula to adopt a balanced approach, supporting the development of SDL skills while recognising students' ongoing need for structure and emotional support. Tailored SDL frameworks, integrated gradually from the first year, could support autonomy while reducing students' experiences of stress and anxiety. Such efforts are vital in preparing students not only for academic success, but also for the realities of lifelong learning in a rapidly evolving healthcare landscape.

A notable concern was students' low confidence in managing stress, with over 70% indicating that they lacked effective stress management strategies. This challenge, which compares with findings in similar populations,[15] poses a potential barrier to the successful implementation of SDL, particularly in an e-learning environment where students may feel isolated or overwhelmed. The stress associated with independent online learning could exacerbate feelings of disengagement or anxiety, especially in students who are still adjusting to the demands of tertiary education.[26,27] Inadequate stress management skills could also translate into a reduced ability to manage tests and exams, as indicated by almost half of the participants.[28] This finding underscores the importance of embedding psychological support structures, such as resilience training, stress management strategies, peer mentoring and wellbeing assessments, into blended- and e-learning initiatives.

Study limitations

The 43% response rate, while acceptable, may limit the generalisability of the findings. Male students were significantly fewer than female students (5% v. 95%). However, the number of participants proportionally reflects the demographic distribution of registered male physiotherapy students (total physiotherapy cohort comprises 14.8% males and 85.2% females). Most respondents were in the early years of study, with limited participation from final-year students. This uneven distribution may affect the applicability of findings across the full curriculum. Furthermore, the study did not explore associations between SDL domains or between demographic variables and SDL readiness. Future research may benefit from examining these relationships to provide deeper insight. Lastly, the potential for self-selection bias exists, as students more inclined toward e-learning or SDL may have been more likely to participate.

Recommendations and implications for curriculum development

To support SDL in physiotherapy education, educators could implement scaffolded learning strategies. In year 1, foundational skills may be developed through structured group activities, transitioning to more autonomous, self-directed projects in years 2, 3 and 4. Blended learning elements, such as short video tutorials, online forums and digital planning tools, can support students who prefer guided instruction. Furthermore, embedding resilience-building strategies, such as stress management workshops, peer mentoring and reflective journalling within the curriculum could better equip students to manage academic and personal demands.

Conclusion

This study provides insight into physiotherapy students' perceived readiness for self-directed e-learning at a SA tertiary institution, while acknowledging that perceived readiness may not always equate to actual competence. Stress management emerged as a notable area of concern, suggesting that psychological and contextual factors may influence students' capacity to fully engage in SDL. These findings highlight the importance of implementing

structured, scaffolded approaches to SDL alongside targeted support systems such as stress management interventions. Strengthening both the psychosocial and academic scaffolding available to students may enhance their capacity to transition from structured learning environments toward greater independence, thereby supporting more effective engagement with self-directed e-learning and ensuring broader academic success.

Data availability statement.

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