Pharmacy Education (2023) 23(1) 656 - 664
https://doi.org/10.46542/pe.2023.231.656664

RESEARCH ARTICLE

Exploring learning analytics and motivated strategies for learning questionnaire (MSLQ) to understand pharmacy students' learning profiles, motivation and strategies post-COVID

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Keywords
Learning analytic
Learning strategy
Motivation
MSLQ
Profile

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Abstract

Background: First-year pharmacy students experienced on-site education after three years of studying online in isolation. **Objectives:** This study aimed to analyse newly enrolled first-year pharmacy students' learning profiles using learning analytics from YouTube, and further understand their motivation and learning strategy during the transition period. **Method:** Learning Analytics (LA) were retrieved from YouTube analytics on instructor-generated videos. Students' motivation and learning strategies were acquired using the Motivated Strategies for Learning Questionnaire (MSLQ) with a seven-point Likert score distributed online using Google Forms. Data were analysed using SPSS, and interview sessions were conducted with some of the students. **Results:** The LA showed most students referred to the instructor-generated video during study week. Students avoided the tutorial video with a view ratio lower than 1.0. This result correlated with the lower metacognitive mean compared to the cognitive level in the MSLQ analysis. Dependant on extrinsic components has increased their anxiety level. The peer learning scored higher than the help-seeking and was confirmed through interviews. **Conclusion:** This study offers insights into students learning motivation and strategies. Well-designed instructional learning activities may help in improving their problem-solving skills to boost their motivation. The teacher-student relationship may need more effort to build.

Introduction

As the COVID-19 pandemic transitioned to the endemic phase, teaching and learning activities gradually shifted from online learning to blended learning. During the first and second years of the Movement Control Order (MCO) imposed by the Malaysian government to curb the spread of the virus, all Teaching and Learning (T&L) activities were conducted entirely online. In the third year, laboratory practicals with limited numbers of students were held physically, while lectures and problem-based learning remained online. By the second term of the third year, all T&L activities had finally returned to pre-COVID conditions. Pre-university courses experienced a similar trajectory.

Over the three years of online learning, students studied at their own pace and were assessed through either proctored or non-proctored online examinations. As a result, some students have found it challenging to adjust to the structured onsite lectures scheduled for a minimum of eight hours daily. During this transition period, it was crucial for students to remain motivated to achieve their learning goals.

To support students during the adjustment period, recorded presentations on lecture content were uploaded to YouTube in video format, making them accessible to students. Questions were embedded within these video lectures, allowing students to self-evaluate their understanding. Answers to the questions were provided along with audio-video explanations in separate YouTube videos. Uploading lecture content and questions to YouTube facilitated the collection of authentic raw data on student usage through the YouTube Analytics or Learning Analytics (LA) tool. Learning Analytics tools, such as YouTube Analytics, enable instructors to identify usage patterns for their instructional videos and gain insights into their effectiveness. Data mining from LA helps instructors evaluate student behaviour and performance (Li *et al*., 2022). The primary purpose of LA models is to enhance learning and examine the learning process (Heikkinen *et al*., 2023).

Another aspect that has raised concerns as the pandemic ends is students' mental states (anxiety, depression, panic, anger, and rebellion) resulting from the movement control orders and the turmoil created by the pandemic (Stoian *et al*., 2022). The group were interested in understanding the level of motivation and learning strategies of newly enrolled first-year undergraduates in the pharmacy programme. They had been studying online in isolation for the last three years during the most critical academic years, the pre-university phase, of their lives. This group of students has undergone two major national examinations, similar to the "*O-level*" and "*A-level*" pre-university programmes, which affect their selection of courses to study at university and subsequently shape their career paths.

This study aims to 1) analyse student learning profiles using learning analytics from YouTube Analytics; and 2) understand students' motivation and learning strategies using the Motivated Strategies for Learning Questionnaire (MSLQ) model. The MSLQ model was chosen as this group of students transitioned from online learning to blended learning and were self-regulating their learning during online learning, with the need to adjust for blended learning. This study serves to establish a baseline to identify pharmacy students' predominant learning approaches toward the fundamentals of organic chemistry. By identifying their learning approaches, tailored interventions can be made to modify and improve their learning strategies.

Theoretical framework

Learning Analytics (LA) is commonly defined as "*the measurement, collection, analysis, and reporting of data about learners and their contexts, for purposes of understanding and optimising learning and the environments in which it occurs*" (Vilberg *et al*., 2020). It has been repeatedly reported as an essential educational technology to support learning and enhance the learning experience. LA could transform educational data into useful information for decision-making. The application of the LA technique allowed a considerable volume of raw data extraction and enabled pattern identification of learning styles and relationships (Geng *et al*., 2024).

Self-regulated learning (SRL) is a self-directed learning process involving monitoring, control, and reaction in the learning process (Pintrich, 2000; Esnaashari *et al*., 2023). Self-regulation theory consists of four basic components: Determining a standard, monitoring, willpower, and motivation. SRL indicates a presence of "*personal initiative, perseverance, and adoptive skill*" (Zimmerman, 2011) which is needed during online learning. It is a multi-dimensional consideration of where, why, and how some learners employ self-regulation in their learning experiences, while others do not (Zimmerman, 2011). The SRL model was analysed with the questionnaire-based model, namely, the Motivated Strategies for Learning Questionnaire (MSLQ) developed by Pintrich (Pintrich, 2000; Esnaashari *et al*., 2023). It is comprised of motivational scales and learning strategies scales. Both these scales influenced students learning.

Methods

Participants

There were 175 first-year students, and according to the Raosoft sample size with a 95% confidence level and 5% margin error, the minimum recommended number of respondents was 121. The respondents were newly enrolled first-year students. The MSLQ questionnaire (Pintrich *et al.*,1993) consisted of 81 questions and was distributed through Google Forms. To avoid repeated submission, the student identity number (I.D.) was used as an identifier in filling in the questionnaire survey. To ensure anonymity, all the student IDs were removed from the responses after the closing date for questionnaire submission. All the questions needed to be answered before they could move on to the next question. Additionally, questions on demographic distribution (sex and education background) and learning materials for the final exam were included in the questionnaire. The study was approved by the UiTM Research Ethics Committee (049/2023). Informed consent was obtained from all participants before data collection. Participation in this study was entirely voluntary.

Questionnaire development and validation

The questionnaire used for this research project was adopted from published reports. The validity and reliability of the full MSLQ were confirmed in the literature (Pintrich *et al*., 1993; Feiz *et al*., 2013; Esnaashari *et al*., 2023) and applied to various disciplines (Cook *et al*., 2011; Horne *et al*., 2018; Soemantri *et al*., 2018; Karaoglan Yilmaz & Yilmaz, 2021; Berdida & Grande, 2023; Galal *et al*., 2023) to understand the motivation and learning strategies of learners. Additionally, pilot testing of the questionnaire was conducted which demonstrated good face and content validity. The face validity that involved assessing the readability, length, and relevance of the online questionnaire was done by three senior pharmacy lecturers who had been trained in questionnaire design. Pre-testing was also conducted, where 38 students were involved. The internal consistency of the final questionnaire was determined using Cronbach's Alpha coefficient (Cronbach's Alpha value was 0.76).

The lectures on the fundamentals of chemistry were taught onsite. The topics covered were alkynes, polyunsaturated hydrocarbons, introduction to alkyl halides, substitution (Sn1 & Sn2) in alkyl halides, and elimination (E1 & E2) in alkyl halides. Instructor-generated videos on the lecture topics were accessible on YouTube. Each video lasted 15 to 30 minutes. Questions were embedded in the videos, and answers were explained by the instructor and recorded in video format, accessible on YouTube.

Students rated themselves on a seven-point Likert scale, ranging from "*not at all true of me*" with one point to "*very true of me*" with seven points. Scores were constructed by taking the mean of the items. Students were assessed on the nine scales of the MSLQ (Task value, Self-efficacy for learning and performance, Test anxiety, Rehearsal, Elaboration, Organisation, Metacognition, Time and study environment management, and Effort regulation). The questionnaire consisted of 31 questions on motivation (Task value, Self-efficacy for learning and performance, Test anxiety) and 50 questions on learning strategies (Rehearsal, Elaboration, Organisation, Metacognition, Time and study environment management, and Effort regulation).

The internal consistency of motivation and learning strategies showed adequate Cronbach Alpha reliability levels of 0.893 and 0.876, respectively. Students' backgrounds and prior knowledge of these topics were asked in the questionnaire. The quantitative data were analysed with SPSS Version 22. Interviews were conducted with a random selection of participants. Interview data were used only to enrich the discussion of the results of this study.

Results

The number of respondents was 130 and complied with the sample size with a 95% confidence level and 5% margin error. They were comprised of 14% male and 86% female. Most students have an education background in Diploma in Pharmacy (33%), UiTM Foundation Studies (33%), and Matriculation (31%). The rest of the respondents were from Diploma in Science (2%) and Foundation from other universities (1%).

Students' learning styles from learning analytics

In 2022, teaching and learning activities (lectures and assignments) except laboratory practicals were conducted online synchronously with the support of instructor-generated videos on the lecture content and were uploaded to YouTube. The student's engagement with the instructor-generated video was recorded with YouTube Analytics.

In 2023, all the teaching and learning activities were conducted face-to-face. Nonetheless, students were given access to instructor-generated video lectures as well. For both 2022 and 2023, learning analytics consistently recorded a higher number of viewers during the study week (Figure 1). There were no significant differences in the number of views between 2022 and 2023. Therefore, the average view numbers or view ratios for both 2022 and 2023 were reported.

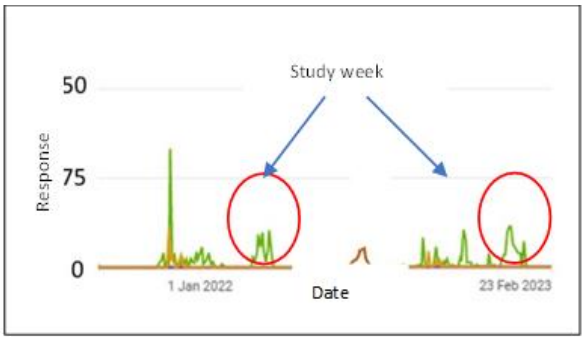

Figure 1: Learning analytics on the cumulative topics for two years

More than 60% (Table I) of students have learned four of the topics during their pre-university programme. The last topic elimination in alkyl halides was new to 60.6% of the students. About 30% of the students prefer learning these topics online.

Table I: Student's prior knowledge of the lecture topics

No.	Topics	Prior knowledge	
		Yes (%)	No (%)
1	Alkynes	60.6	39.4
2	Polyunsaturated hydrocarbons	69.1	30.9
3	Introduction to alkyl halides	70.2	29.8
4	Substitution (Sn1 & Sn2) in alkyl halides	59.6	40.4
5	Elimination (E1 & E2) in alkyl halides	39.4	60.6

From the learning analytics gathered from the instructor-generated YouTube, students viewed the video lecture at least once or twice (Table II) for either 2022 or 2023. There was no significant difference in the ratio of LA viewing between both years although it was conducted through synchronous live lectures in 2022 compared to physical lectures in 2023. Since there was no significant difference in the number of views for each topic, the average of the view ratio data was used to understand the student's learning profile.

The duration of the video on the lectures was short to avoid cognitive overload. The recorded video for Topics Four and Five (Table II) was split into two shorter or smaller sections to avoid cognitive overload. Each of the videos lasted between 15 to 31 minutes, with an average audience retention of 45% or between six to eleven minutes.

Table II: Average of student's video duration and audience retention

Week	Topics	Video duration (min)	Average audience retention in min (%)	LA view ratio		
				2022	2023	Average
	A. Lecture topics					
1	Alkynes	31:19	9:58 (31.8%)	2.7	2.2	2.4
	Polyunsaturated hydrocarbons	23:55	9:53 (41.4 %)	1.7	1.5	1.6
2	Introduction to alkyl halides	17:35	7:57 (45.3%)	1.4	1.3	1.4
	Sn1	20:35	9:45 (47.4%)	1.2	1.0	1.1
	Sn2	22:17	10:58 (49.2%)	1.2	1.1	1.1
3	E1	15:30	6:53 (44.5%)	1.1	1.1	1.1
	E2	16:31	9:06 (55.1%)	1.3	1.1	1.2
	B. Tutorials					
1	Tutorial 1	0:11	0:11 (105.5%)	1.6	1.0	1.3
	Tutorial 2	4:14	1:47 (42.3%)	1.0	0.7	0.8
2	Tutorial 3	1:35	0:51 (54.2%)	0.5	0.6	0.5
	Tutorial 4	5:05	2:30 (49.4%)	0.7	0.6	0.7
3	Tutorial 5	1:40	1:05 (65.7%)	0.5	0.7	0.6

*LA : Learning Analytics; View ratio=number of view/total number of students

Questions were embedded in the instructor-generated video of the lecture topics for the students to self-evaluate their comprehension of the knowledge content. The average view ratio of all the tutorial topics (Table II) was lower than 1.0 except for the first tutorial. This trend of the first tutorial having a higher viewer ratio was similar to the first lecture on the alkynes and polyunsaturated hydrocarbon topics. The rest of the tutorials register a lower view ratio of below 1.0.

Learning material for the final exam preparation

All the students (100%) referred to the lecture notes for final exam preparation (Table III). The number of students referring to instructor-generated videos (91.5%) was slightly higher than other online accessible videos (89.4%) available from YouTube. Only a small percentage of students (35.1%) referred to either books or ebooks.

Table III: Reference materials used for final exam preparation

No.	Reference materials	%
1	Lecture slides	100.0
2	Books/eBooks	35.1
3	Instructor-generated video lectures	91.5
4	YouTube videos on similar topics from the internet	89.4

Student's motivation

To succeed in education, students need to be motivated to study. The mean of the extrinsic goal orientation is higher than the intrinsic goal orientation (Table IV). The lowest score was from self-efficacy for learning and performance (Table IV). This refers to students' self-appraisal of their ability to master a task. The test anxiety score is high and can disrupt performance.

Table IV: Student's motivation and learning strategies

No.	Description	Mean	Std dev	Components	Mean	Std dev
A. Motivation						
1	Intrinsic goal orientation	4.7	1.1	Value	5.2	0.8
2	Extrinsic goal orientation	5.8	1.0			
3	Task value	5.5	0.7	Expectant	5.3	0.8
4	Control of learning beliefs	6.0	0.7			
5	Self-efficacy for learning and performance	4.4	0.9			
6	Test anxiety	5.6	0.8	Affective	5.6	0.8
B. Learning strategies						
1	Rehearsal	5.3	0.7	Cognitive learning skills	5.2	0.2
2	Elaboration	5.0	0.9			
3	Organisation	5.3	0.9			
4	Critical thinking	4.8	0.7	Metacognitive learning skills	4.8	0.1
5	Self-regulation	4.7	0.6			
6	Time and study environment	4.9	0.5	Resource management strategies	5.0	0.1
7	Effort regulation	5.0	0.9			
8	Peer learning	5.0	0.9	Seeking help	4.8	0.3
9	Help seeking	4.6	1.1			

Learning strategies

The mean score of metacognitive learning skills and seeking help were lower. The cognitive learning skills (rehearsal, elaboration, and organisation) scored higher than the metacognitive learning skills (critical thinking and self-regulation) (Table IV). Students have high scores on resource management skills comprised of time and study environment and effort regulation. Their peer learning score was higher than help seeking score (Table IV).

When the motivation six constructs were grouped according to Pintrich's value, expectant and affective components were correlated, and a significant correlation was observed between the expectant component and the value (r^2 = 0.708) component (Table V). When the learning strategy nine constructs were grouped into Pintrich's four groups of learning strategies, namely cognitive learning skills, metacognitive learning skills, resource management strategies, and seeking help were correlated amongst them, the cognitive learning skills were significantly correlated to their metacognitive skills (r^2 = 0.840) and seeking help (r^2 = 0.647) (Table V). The correlation between motivation and learning strategies was observed between the value component and metacognitive learning skills (r^2 = 0.582).

Table V: Correlation between motivation and learning strategies

Components	Motivation			Learning strategies			
	Value	Expectant	Affective	Cognitive learning skills	Metacognitive learning skills	Resource management strategies	Seeking help
Motivation							
Value	1.000	0.708**	0.448	0.429	0.582*	0.318	0.218
Expectant	0.708**	1.000	0.454	0.425	0.411	0.362	0.381
Affective	0.448	0.454	1.000	0.355	0.512	0.051	0.115
Learning strategies							
Cognitive learning skills	0.429	0.425	0.355	1.000	0.840**	0.462	0.647*
Metacognitive learning skills	0.582*	0.411	0.512	0.840**	1.000	0.441	0.380
Resource management strategies	0.318	0.362	0.051	0.462	0.441	1.000	0.346
Seeking help	0.218	0.381	0.115	0.647*	0.380	0.346	1.000

** Correlation is significant at the 0.01 level; * Correlation is significant at the 0.05 level

Discussion

Both the educational background and prior knowledge (Table I) provided information to adjust T&L activities to ensure students could follow the lessons and apply them to solve problems. The learning analytics provided real-time data on students' learning profiles. Although 60% of the students had studied these topics in their pre-university programmes (Table I), in the one-to-one interviews, students found the content of these topics to be more in-depth compared to their earlier pre-university education, and they could relate the content knowledge to their profession. The inclusion of real-world problems during lectures may have connected the theory to application and relation to their profession. This was incongruent with a study by Choo and colleagues in 2022, showing exposure to real problems allowed students to relate to their profession (Choo *et al*., 2022a).

The dips and spikes in the learning analytics provided details on students' attention to the content in the video. They can choose to skip certain sections of the video and the spikes or dips in the video analytics showed where the students need more enforcement to supplement their learning. If the dips were on important points that the students might have missed, instructors can address this in the following lectures or learning activities. The longest audience retention of 55.1% (Table II) was on a topic (elimination in alkyl halides) unfamiliar to 60.6% of the students (Table I). Although the students were from different pre-university backgrounds and had different prior knowledge of the lecture topics (Table I), the video provided online learning or revision to them as the average LA view ratio of lecture topics was between 1.1 to 2.4 (Table II). Irrespective of the duration of these video lectures, students could focus for about ten minutes online. Retrospectively, uncertainty is high on whether the students could focus fully on two hours of physical lecture.

The Learning Analytics showed only the first two tutorials on the first week attracted attention with a higher recorded view ratio of 1.0 to 1.6 (Table III). The other three tutorials on the second- and third-week view ratio were low (between 0.5 to 0.7); indicating students did not self-evaluate their understanding and they were not cognitively engaged in their learning. This was supported by their low mean self-regulation of 4.7 (Table IV) and learning material used for reference in the final exam where books or eBooks usage was around 35% (Table III). Evaluation of Bloom's taxonomy cognitive levels one and two, namely, remembering and understanding of facts in multiple-choice questions, were seldom found in videos or lecture slides, rather books or eBooks would be the choice. Besides facts, books or eBooks also provide questions with solutions for students to practice their problem-solving skills.

From Learning Analytics, during the study week, less than 10% of the students referred to answers to the tutorials training on Bloom's taxonomy cognitive level three, namely, application questions using newly learned concepts to apply to new situations. Hence, it can be concluded that students were not fully engaged in their studies.

Motivation and engagement can be conceptualised as students' energy and drive to engage, learn, work

effectively, and achieve their potential at university and the behaviours that follow from this energy and drive. Motivation and engagement support student achievement (Curtis *et al*., 2022). As motivation might be a reason for students being non-engaged, the Motivated Strategies for Learning Questionnaire (MSLQ) was used and some of the students were interviewed. The MSLQ consisted of two parts, namely, motivation and learning strategies. Both the motivation and learning strategies could help students identify their strengths and improve their weaknesses resulting in improved learning and grades. The MSLQ was used for self-regulated learning as most students interviewed were transiting from online learning to blended learning and were found to be studying alone similar to during online learning.

Students scored higher on the extrinsic goal than on intrinsic goals (Table IV). They perceive extrinsic goal orientation, namely, grades, rewards, performance, and evaluation by others as the motivational factors for them to succeed. Students who are extrinsically motivated are usually using the surface approach to learning. Their learning strategy included rehearsal, elaboration, and organisation to get good scores on their test results and approval from their friends and family (Gezgina & Kurtça, 2023). This approach enables students to answer the first and second cognitive levels of Bloom's taxonomy, namely, on remembering and understanding. However, facts are not completely available from lecture slides or videos. Thus, students may need support or guidance from lecturers to align their learning strategy with the assessment format. Learning strategies are skills that can be taught (Zeidner & Stoeger, 2019). Educators or instructors must understand students' learning strategies so that appropriate T&L activities can be designed with suitable teaching approaches to promote successful teaching and learning in the classroom. Students' learning processes and responses in different circumstances are affected by their learning strategies (Biwer *et al*., 2020).

The low mean value of 4.4 for self-efficacy for learning and performance (Table IV) may indicate low self-confidence in their skills. Self-efficacy is a self-appraisal of one's ability to master a task. Self-efficacy includes judgments about one's ability to accomplish a task as well as one's confidence in one's skills to perform that task. Although problem-solving exercises were provided, students were not motivated to attempt them. Thus, confidence and motivation need to be introduced gradually to increase their self-efficacy and self-regulation.

According to Pintrich and colleagues in 1993, both the intrinsic and extrinsic components were categorised as the value components (Pintrich *et al*., 1993). The student's value component (Table V) comprising intrinsic and extrinsic goals had a significant correlation with the expectant (r^2 = 0.708) component. Among the expectant components, the control of learning beliefs (Table IV) scored the highest mean. The students believed that their efforts to learn would result in positive outcomes. They are more likely to put in more effort to ensure changes occur. Students' motivation to study was influenced by their belief that they could control the outcome of their studies and the usefulness of their task and self-efficacy for success depends on themselves. The high expectation for success has also caused high anxiety among them and a significant correlation (r = 0.513) between them was observed (Table V). High anxiety is known to have an opposite relationship with academic performance (Aluh *et al.*, 2020). Moreover, this was observable in their lower mean score on self-efficacy (Table V) which could have damper their effort. The emotion control or regulation strategy may be introduced as it has been shown to lower levels of anxiety (Gehle *et al*., 2023).

The cognitive learning skills component (Table V) comprised of rehearsal, elaboration, and organisation skills were highly correlated to the metacognitive component (r = 0.840) indicating students were fully immersed. However, the low mean of metacognitive skills (Table IV) indicates that students lack problem-solving skills (Güner & Erbay, 2021). The lower metacognitive learning skills scores (Table IV) correlated with the observation in the view ratio of Learning Analytics (Table II) where the lecture topics have a higher view ratio than the tutorial view ratio (Table IV) on problem-solving. Students failing to solve questions within the desired time frame or postponing until the last-minute activities exhibit behaviour inconsistent with self-regulated learners. This behaviour of work-avoidance goal orientation has affected their use of metacognitive strategies (Tuominen *et al*., 2020) and thus a lower mean of 4.8 on their metacognitive learning skills.

Metacognitive skills refer to the awareness, knowledge, and control of cognition and include planning, monitoring, and regulating processes. The assumption that self-monitoring, regulation, and performance are related is based on the theoretical framework of metacognition by Nelson and Narens (1990). Monitoring influences regulation decisions, which then affect performance. Accurate self-monitoring is thus presumed to be a prerequisite for adequate regulation and high task performance. Through self-monitoring, a person is aware of the discrepancy between goals and the present state of learning. In response to self-monitoring, learning actions can be taken to reach learning goals (Moilanen, 2007). Students have yet to

maximise their metacognitive learning skills without self-evaluation and self-monitoring. Exposure and discussion in well-designed instructional activities may help in improving critical thinking skills (Choo *et al.*, 2022b).

The mean score of resource management strategies was acceptable. Students were well organised to ensure their study environment and time were adhered to and were good in effort regulation. They sought help with their cognitive learning skills, but surprisingly help-seeking was not correlated to their metacognitive learning skills as indicated by a low and insignificant correlation of r^2 = 0.38 (Table V). When interviewed, students indicated they did not practice problem-solving skills, did not refer to books to try out the questions, nor looked into the questions in the instructor-generated video lecture as their timetables were rather packed with daily lectures and assignments.

Research showed that students in higher education are often not adequately prepared to use resource-management strategies effectively and this has affected their performance (Waldeyer *et al.,* 2020). Appropriate support should be given to them to improve their resource management. In the interview, students mentioned they feel too shy to seek lecturers' help as they feel they may not be ready if the lecturers pose questions to them. The teacher-student relationship may need more effort to build amongst the learning community. More poorly adjusted students perceived themselves as less competent to succeed, experienced greater test anxiety, and were less likely to regulate their study environment, persist in the face of difficulty, and seek academic assistance when needed. Psychological distress with concomitant limited coping resources on both self-efficacy and resource management had a significant indirect effect on performance and demonstrated the important role of self-efficacy and resource management (Heo *et al.,* 2022).

The results of the MSLQ of each student were returned. They were advised according to their MSLQ scores to improve on areas with low scores and changed their learning strategies. Consequently, fewer failures were observed in the next term.

Limitations

The data is limited to first-year pharmacy students who have experienced studying online in isolation for three years during the COVID lockdown. Both the LA from YouTube and MSLQ are good tools for understanding the learning profile, motivation, and strategies of students and can be extended to other years to improve students' performance.

Conclusions

LA provided real-time data on students' learning profiles and was used to understand students' learning motivation and strategies. The MSLQ showed students need more guidance on intrinsic motivation and metacognitive skills to improve their self-regulated learning. They need to be encouraged to seek help from lecturers or facilitators. Confidence can be built through well-designed T&L activities involving group discussion or teamwork on problem-based questions. The teacher-student relationship may need more effort to build amongst the learning community.

Conflict of interest

The authors declare no conflict of interest.

Source of funding

The authors did not receive any funding for this study.

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