Information Management and Business Review (ISSN 2220-3796)
Vol. 15, No. 3, pp. 441-455, September 2023

Examining Demographic Differences in Online Learning Self-Efficacy and Online Self-Regulated Learning

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Abstract: Online learning and blended learning have become a practice in many universities for modes of learning during the Covid-19 pandemic. Therefore, students' online learning self-efficacy and online self-regulated learning are necessary to be explored. This quantitative study included a sample of 442 university students enrolled in management science, social sciences and humanities, and science and technology disciplines of study. Six online learning self-efficacy (self-efficacy in computer/internet, self-efficacy in online learning environment, self-efficacy in time management, self-efficacy in interacting with lecturers in online courses, self-efficacy to interact socially with classmates, and self-efficacy to interact academically with classmates) and six online self-regulated learning (goal setting, environment structuring, task strategies, time management, help-seeking, and self-evaluation) dimensions were studied. The study found students exhibit high levels of online learning self-efficacy and online self-regulated learning. No gender differences were found in both online learning self-efficacy and online self-regulated learning. Younger students (20 years old and below), students in lower semesters (semester 1 or 2), and students with good to very good internet connectivity in their places of stay for online learning exhibited higher in both online learning self-efficacy and online self-regulated learning. Non-graduating students had higher self-efficacy to interact with lecturers and to interact socially and academically with classmates than graduating students. Students in management science social science and humanities courses exhibited higher online self-regulated learning but not online learning self-efficacy.

Keywords: *Online learning self-efficacy, online self-regulated learning, online learning environment, online learning satisfaction, academic performance.*

1. Introduction

The topics of self-efficacy and self-regulated learning have received considerable attention in numerous researches. A considerable amount of literature has been published regarding these topics. (Bandura & Ramachaudran, 1994) defined perceived self-efficacy as people's beliefs of their capabilities for the achievement of designated levels of performance that have influences on events that impact their lives. According to (Bandura & Ramachaudran, 1994), self-efficacy beliefs determine how people feel, think, behave, and motivate themselves. Teachers must have creativities to create learning environments, conducive to cognitive skills development which in turn can motivate their students and enhance their cognitive development in self-efficacy (Bandura, 1994). Zimmerman (2000) found that self-efficacy beliefs are sensitive to subtle changes in students' performance context, interacting with self-regulated learning processes, and mediating students' academic achievement. A person is said to have a high level of self-efficacy toward a task and will be more likely to achieve a goal if he or she puts more effort towards it. According to Hodges (2008), learner self-efficacy beliefs may be affected if the mode of learning changes, for example from face-to-face to online sessions. Self-efficacy can be a key component of academic success in online learning with the self-directed nature of online learning as argued by many researchers (Hodges, 2008). Therefore, it is critical to study whether online learning self-efficacy plays an important role in online learning satisfaction as well as students' academic performance.

Self-regulated learning strategies refer to actions and processes directed at the acquisition of information or skills that involve agency, purpose, and instrumentality perceptions by learners (Zimmerman, 1990). He also added that self-regulated learners are distinguished from other regulated learners by their awareness of strategic relations between regulatory processes or responses and learning outcomes and their use of these strategies to achieve their academic goals. (Chumbley et al., 2018) determined the self-regulated learning

level of students in an online agriculture course and found that the highest self-regulation was within environmental structuring and goal setting while the lowest online self-regulated learning was in the area of task strategies. The study also showed that females had a higher level of self-regulated online learning compared to males and students' experiences with online courses had low correlations with their perceived online self-regulated learning level. (Stephen & Rockinson-Szapkiw, 2021) revealed positive and significant associations between online learning self-efficacy, self-regulation, and self-direction. In an online learning setting, self-efficacy along with self-regulated learning can lead to online learning satisfaction that may result in successful online learning. To be successful in online learning, students must also be ready and willing to accept and learn in online learning environments if needed. A recent study by (Abdul Halim et al., 2022) reported that students were ready for computer/internet self-efficacy, self-directed learning, motivation for learning, and online communication self-efficacy but moderately ready for learner control.

Edisherashvili et al. (2022) highlighted that education level was an important factor in self-regulated learning research as learners of different ages differed considerably in the way they learn. According to (Oates, 2019), methods to approach learners in self-regulated learning were different across age groups. Another study by (Kellenberg et al., 2019) concluded that teachers played important roles for children to be successful in self-regulated learning in the school contexts while in the case of adult learners; the instructional design was a driving factor for successful self-regulated learning. At the higher education level, learners are expected to be more autonomous, and in need of taking control of their learning process as academic demands and expectations also differ across age groups (Zimmerman, 2000). Therefore, it is also important to study how online learning self-efficacy and online self-regulated learning differ across other demographic variables such as semester of study, discipline of study, student status, and internet connectivity.

Most of the previous studies were focused on the technology factor of self-efficacy in online learning as mentioned by Alqurashi (2016) & Shen et al., (2013) and limited studies were done on multi-dimension of self-efficacy in online learning settings. There have also been limited studies on the relationship between self-efficacy and self-regulated learning in online learning contexts among university students, especially after the COVID-19 pandemic. Therefore, this study addresses the gap in the literature by accounting for the three aspects of online learning self-efficacy (technology, learning, and interaction) and online self-regulated learning influencing online learning satisfaction and academic performance. In addition, the study investigates the effects of demographic variables (gender, age group, semester of study, students' status, discipline of study, and internet connectivity) on students' online learning self-efficacy and online self-regulated learning. Furthermore, the study explores the relationships between online learning experiences (number of semesters using online learning, number of courses taken, number of online learning platforms used, and quality of online learning) on each online learning self-efficacy and online self-regulated learning. The findings of this study are hoped to contribute to the continuing growth of online learning research especially in self-efficacy and self-regulated learning in online learning settings. For continuous improvement in online learning and blended learning activities, issues on online learning self-efficacy and online self-regulated learning can be emphasized by lecturers when conducting online learning or blended learning activities.

Background of Study: The roles of self-efficacy and self-regulated learning are important in online learning environments. These issues are becoming more important to tackle especially during this post-COVID-19 pandemic period as many universities have encouraged lecturers to conduct classes using either online or blended modes of learning.

Significance of Study: The findings of this study are hoped to provide insights into the future directions in areas related to the development of students' self-efficacy and students' self-regulated learning abilities in virtual learning environments. The study is also expected to provide insights into the continuous improvement of Malaysian universities' facilities and infrastructure in both face-to-face and online learning environments, which will subsequently improve the quality of online and blended learning deliveries.

Research Questions: The accompanying research questions were designed to investigate the importance of self-efficacy and self-regulated learning in online learning environments.

How do each online learning self-efficacy dimension and online self-regulated learning dimension differ demographically (gender, age group, semester of study, students' status, discipline of study, and internet connectivity)?

2. Literature Review

Self-Efficacy and Self-Regulated Learning in Online Learning Settings: There are numerous previous studies on online learning self-efficacy. However, many of these studies mainly only consider the technological aspect of online learning as reported by Shen et al. (2013), Alqurashi (2016) & Ithriah et al., (2020). According to Shen et al., (2013), at least three aspects of online learning should be considered; technology, learning, and social interaction. Alqurashi (2016) in his reviewed studies on online self-efficacy emphasized that learning, interaction, and collaborative skills should also be considered, even though computer skills, internet skills and information-seeking skills were needed for online learning. He added that these four aspects together are important to study when measuring online learning self-efficacy. For this current study, only three aspects of online learning self-efficacy were considered.

Shen et al. (2013) described online learning self-efficacy in five dimensions; self-efficacy to complete an online course, self-efficacy to interact socially with classmates, self-efficacy to handle tools in a Course Management System, self-efficacy to interact with instructors in an online course, and self-efficacy to interact with classmates for academic purposes representing the three aspects of online learning; technology, learning, and interaction. Ithriah et al. (2020) studied on a sample of 101 university students in Surabaya, Indonesia regarding the role of online learning self-efficacy on e-learning success. The findings in this study revealed that online learning self-efficacy has a positive and significant relationship with the use of e-learning, indicating that the use of e-learning sites would increase if the value of online learning self-efficacy was high. A systematic review by Peechapol et al. (2018) of 25 studies between 2005 and 2017, found various factors such as online learning experience and knowledge, feedback and reward, online communication and interactions, social influence, and learner motivation and attitude, affecting online learning self-efficacy. Jan (2015) who measured academic self-efficacy, computer self-efficacy, prior experience with online learning, and student satisfaction, found three important results; positive and significant relationships between computer self-efficacy and prior experience with online learning, between academic self-efficacy and prior experience with online learning, and between academic self-efficacy and computer self-efficacy. This means, that prior experience with online learning (Jan, 2015) influenced both computer and academic self-efficacies. Apart from that, academic self-efficacy was also associated with computer self-efficacy.

Ulfatun et al. (2021) & Santoso et al. (2022) found students' ages 18 – 23 years exhibited high levels of online learning self-efficacy and online learning self-regulated learning and there was a strong positive relationship between online learning self-efficacy and online self-regulated learning. (Cho & Kim, 2013) showed that mastery goal orientation as well as instructor scaffolding for interaction were significantly related to students' self-regulation, suggesting that self-regulation between the student and others should be understood as an important aspect of online self-regulation. Santoso et al. (2022) highlighted that although students' online learning self-efficacy and online self-regulated learning were at above-average levels, their confidence and abilities to seek help, develop task strategies, and allocate time for online learning were still at low levels. These would be the insights that the lecturers could tackle when conducting their online learning classes and in such a way, online self-regulated learning could be enhanced.

Variables Determining Online Learning Self-Efficacy and Online Self-Regulated Learning: The ten variables relating to students' self-efficacy and self-regulated learning in online learning environments are gender, age group, semester of study, students' status, discipline of study, internet connectivity, number of semesters using online learning, number of online courses taken, number of online learning platforms used, and quality of online learning were considered in this current study. Shen et al. (2013) found that gender was a significant predictor of self-efficacy to complete online courses, self-efficacy to handle tools in a Course Management System, self-efficacy to interact with instructors for an online course, and self-efficacy to interact with classmates for academic purposes except self-efficacy to interact socially with classmates. In general, the results by Shen et al. (2013) demonstrated that female students were likely to have higher online learning self-efficacy than male students. Limiansi & Hadi (2022) reported there were variations in student self-

efficacy profiles based on gender, year of entry, and discipline of study. On the contrary, (Yavuzalp & Bahcivan, n.d.), found no statistically significant difference in online learning self-efficacy between groups regarding either gender or type of school. Shen et al., (2013) also showed that students who took more online courses were more likely to have higher online learning self-efficacy to complete an online course and they were more likely to communicate and collaborate with other students on academic tasks.

Regarding students' online self-regulated learning, (Liu et al., 2021) divided mood management, environment structuring, task strategies, adapting strategies, time management, self-evaluation, and seekhelp-seekingearning processes into three phases; preparatory, performance, and appraisal, and they found that females performed better than males in all of the three phases. Similarly, Hakan Mayda et al., (n.d.) found there was a gender difference in overall online self-regulated learning strategies but no significant difference across education departments. A study by Nivenitha (2017) among adolescents ages 15 – 17 years found that there was no significant difference between gender and self-regulated learning but there was a significant difference between age and self-regulated learning. Another study (Kamali & Bagheri-Nesami, 2022) using multiple linear regression analysis showed that age, gender, marital status, being a medical student, having another job, and online learning acceptance were significant predictors of online self-regulated learning. Zhao et al., (2014) studied on four dimensions of online self-regulated learning; planning, control, regulating, and evaluating among Chinese distance learners found that all the participants had above-average levels of self-regulated learning in all four dimensions. Male distance learners were better in self-regulated learning than female distance learners, especially in control (i.e., content and resources) and all the evaluation dimensions but no age difference was found. (Yot-Domínguez & Marcelo, 2017) revealed that internet information search and instant communication tools are used continually by students to expand and delve into the information they receive in the classroom. The results of the study (Yot-Domínguez & Marcelo, 2017) also evidenced that different technological tools (e.g., collaborative and communication tools, content creation and delivery tools) supported different self-regulated learning strategies. The current study contributes to filling the gap in existing literature on differences and relationships between demographic variables, self-efficacy, and self-regulated learning in online learning environments as these differences and relationships show different findings in previous literature.

3. Method

Participants: A total of 442 students enrolled in eight faculties at a public university in Melaka, Malaysia, participated in the study. Data were collected from participants representing 8 faculties (see Table 1). For further analysis, these eight faculties were divided into three disciplines of study; management sciences, social sciences and humanities, and science and technology.

Learning Contexts: All courses in the university were conducted via online mode of learning. The location for the online classes was either in residential colleges, rented houses, or family houses in urban or rural areas. Interactions among students and between students and lecturers occurred either through asynchronous communication tools (e.g., discussion boards, emails or social media; WhatsApp or Telegram) or face-to-face meetings for students who were staying in the residential colleges or rented houses. Students were engaged in a diverse range of learning tasks such as students' self-reports, group projects, individual projects with peer feedback, individual projects, final projects, final exams, quizzes, and discussions.

Demographic Variables: Demographic information including gender, age group, location of online learning, household monthly income, faculty, semester of study, and internet connectivity were asked from the participants.

Measures: Three instruments were used for this study. First, is in measuring dimensions of online learning self-efficacy and second, is in measuring online self-regulated learning dimensions.

Online Learning Self-Efficacy: Online learning self-efficacy scales used for this study were adapted from Shen et al., (2013) and Zimmerman & Kulikowich, (2016). Self-efficacy in computer/internet (9 items), self-efficacy in an online environment (7 items), and self-efficacy in time management (6 items) were adapted from Zimmerman & Kulikowich (2016) while self-efficacy to interact with lecturers for online courses (6

items), self-efficacy to interact socially with classmates (4 items), and self-efficacy to interact academically with classmates (6 items) were adapted from (Shen et al., 2013). These items were measured using a 5-point Likert scale (1 – no confidence, 2 – low confidence, 3 – neutral, 4 – confidence, 5 – high confidence). The scales allowed the participants to report how confident they were when engaging in various actions in an online course. High scores showed higher levels of online learning self-efficacy. Online learning self-efficacy dimensions showed good to very good internal consistencies with Cronbach's alpha values ranging from 0.870 to 0.917 and the overall consistency of these 38 items was 0.972.

Online Self-Regulated Learning: Online self-regulated learning scales used for this study were adapted from (Barnard et al., 2009). It comprised 22 items constituting six dimensions; goal setting (4 items), environment structuring (3 items), task strategies (4 items), time management (3 items), help-seeking (4 items), and self-evaluation (4 items). These items were measured using a 5-point Likert scale (1 – strongly disagree, 2 – disagree, 3 – neutral, 4 – agree, 5 – strongly agree). The scales allowed the participants to report their level of agreement when they self-regulated their online learning behaviors. High scores showed higher levels of online self-regulated learning. Online self-regulated learning dimensions showed acceptable to very good internal consistencies with Cronbach's alpha values ranging from 0.725 to 0.842 and the overall consistency of these 22 items was 0.948.

Procedure: Lecturers teaching online courses were first selected purposively based on researchers' judgments. These selected lecturers were contacted via email asking permission to survey their online courses. A brief description of the purpose of the research and an online survey link was posted via WhatsApp of the selected online lecturers once they gave permission. The selected online lecturers then posted the survey link to the WhatsApp groups of their online classes. Students then voluntarily participated in the study. The survey was conducted from 12th September 2022 until 8th October 2022.

Data Analysis: Independent samples t-test, one-way analysis of variance (ANOVA), simple linear regression analysis, and multiple regression analysis were performed in this study using IBM SPSS Version 26.0.

4. Results and Discussion

Demographic Characteristics of Participants: The demographic profiles of the 442 participants are presented in Table 1. Most of the participants are female (72.6%), age group is below 20 years old (63.8%), 74.3% is staying at home, either in cities/towns or rural areas for their online learning, 62.7% from household income group less or equal to RM4850 (B40), 52.3% from Business and Management faculty (FPP), 92.1% diploma students, 38.7% in semester 2, and 48% with good to very good internet connectivity in their places of stay.

Regarding students' academic performance, a majority (67.4%) obtained a grade point average (GPA) of 3.00 – 3.74, indicating good results, 15.4% obtained a GPA of 3.75 – 4.00, which indicates very good to excellent results, 14.7% obtained GPA of 2.00 – 2.99 average results. Only 1.6% obtained poor results. Results are shown in Table 1.

Table 1: Demographic Characteristics and Online Learning Experiences of Participants

Demographic characteristics	Category	Frequency	Percent
Gender	Male	121	27.4
	Female	321	72.6
Age group	Below 20 years	282	63.8
	20 years less than 22 years	138	31.2
	22 years or more	22	5.0
Online learning location	Residential college inside the campus	92	20.8
	Rented house outside campus	22	5.0
	Home in city/town areas	265	60.0
	Home in rural areas	63	14.3
Household income	Less or equal to RM4,850 (B40)	277	62.7

Demographic characteristics	Category	Frequency	Percent
group	RM4,851 or equal to RM10,970 (M40)	141	31.9
	RM10,971 or above (T20)	24	5.4
Faculty	Academy of Contemporary Islamic Studies (ACIS)	30	6.8
	Academy of Language Studies (APB)	30	6.8
	Communication and Media Studies (FKPM)	9	2.0
	Hotel and Tourism Management (FPHP)	2	0.5
	Accountancy (FPN)	41	9.3
	Business and Management (FPP)	231	52.3
	Computer Science and Mathematics (FSKM)	77	17.4
	Arts and Design (FSSR)	22	5.0
Discipline of study	Management science (FPP/FPN/FPHP)	274	62.0
	Social science and humanities (ACIS/APB/FKPM/FSSR)	91	20.6
	Science and technology (FSKM)	77	17.4
Semester of study	1	85	19.2
	2	171	38.7
	3	73	16.5
	4	41	9.3
	5	38	8.6
	6 or higher	34	7.5
Students' status	Non-graduating	356	80.5
	Graduating	86	19.5
Internet connectivity at the place of online learning	Poor/very poor	31	7.0
	Average	199	45.0
	Good/very good	212	48.0
Academic performance measured by grade point average (GPA)	0.00 – 1.99 (Poor)	7	1.6
	2.00 – 2.99 (Average)	64	14.7
	3.00 – 3.74 (Good)	298	67.4
	3.75 – 4.00 (Very good/Excellent)	67	15.4

Information on Online Learning: Most of the students (60%) had undergone their online learning classes at their family homes in city/town areas, 20.8% were at the residential colleges on campus, 14.3% were at their family homes in rural areas, and 5% were at their rented houses outside campus (Table 1). The majority of them took online learning for two semesters (45.5%), 6 or more online courses (71.3%), and used three online learning platforms (74.2%). The most preferable online learning platform used for "live" online learning was Google Meet (78.1%), and Google Classroom for notes/tutorial/discussion (76.9%) and students prefer to use Google Classroom and Google Form for assessment with 45.2% and 45.2% respectively. The majority of these students (65.4%) stated that online learning quality was good, 32.1% said it was average, and 2.5% reported was at a poor level. The results of online learning experiences are presented in Table 2.

Table 2: Online Learning Experiences of Participants

Online learning experience	Category	Frequency	Percent
Number of semesters (including the current semester) taking online learning	1	87	19.7
	2	201	45.5
	3	64	14.5
	4	58	13.1
	5	32	7.2
Number of online courses taken in the current semester	1	38	8.6
	2	14	3.2
	3	23	5.2
	4	20	4.5
	5	31	7.0
	6	59	13.3

Number of online learning platforms used	7	115	26.0
	8	131	29.6
	9	9	2.0
	1	25	5.7
	2	89	20.1
	3	177	40.0
	4	98	22.2
	5	51	11.5
	6	2	0.5

Research Question 1: How do each online learning self-efficacy dimension and online self-regulated learning dimension differ demographically (gender, age group, semester of study, students' status, discipline of study, and internet connectivity)?

The levels of online learning self-efficacy and online self-regulated learning were first examined before investigating the relationships between them. Participants' online learning self-efficacy was measured by six dimensions; self-efficacy in computer/internet, self-efficacy in online environment, self-efficacy in time management, self-efficacy to interact with lecturers for online courses, self-efficacy to interact socially with classmates, and self-efficacy to interact academically with classmates. These six dimensions were measured on a 5-point Likert scale (1 = no confidence to 5 = high confidence). Scores based on participants' responses to items in the sub dimension were averaged to measure each online learning self-efficacy dimension. The results indicated that participants' online learning self-efficacy for the six dimensions differed very slightly, with a mean score of 4.11 (SD = 0.611) for self-efficacy in computer/internet, 3.81 (SD = 0.659) for self-efficacy in the online learning environment, 3.97 (SD = 0.675) for self-efficacy in time management, 3.86 (SD = 0.733) for self-efficacy to interact with lecturers for online courses, 4.01 (SD = 0.724) for self-efficacy to interact socially with classmates, and 4.01 (SD = 0.666) for self-efficacy to interact academically with classmates. The mean scores for participants' online learning self-efficacy dimensions ranged from 3.81 to 5.00 and the mean score for the overall online learning self-efficacy was 3.96 (SD = 0.591) which reflects students' high online learning self-efficacy.

Online self-regulated learning was measured by six dimensions; goal setting, environmental structuring, time management, task strategies, help-seeking, and self-evaluation. The results indicated that participants' online self-regulated learning for the six strategies differed very slightly, with a mean score of 4.00 (SD = 0.679) for goal setting, 4.02 (SD = 0.747) for environment structuring, 3.74 (SD = 0.719) for task strategies, 3.83 (SD = 0.728) for time management, 3.93 (SD = 0.712) for help-seeking, and 3.92 (SD = 0.696) for self-evaluation. The scale ranged from 3.74 to 4.02 and the mean score for the overall online self-regulated learning was 3.91 (SD = 0.606), indicating the high level of online self-regulated learning.

Online learning satisfaction was measured with seven items on a 5-point Likert scale (1 – strongly disagree, 2 – disagree, 3 – neutral, 4 – agree, 5 – strongly agree). By computing the average of participants' scores for the seven items, reflecting each participant's score for his or her online learning satisfaction. The online learning satisfaction mean score was 4.13 (SD = 0.579), suggesting a high level of online learning satisfaction among students.

Independent samples t-test and one-way analysis of variance (ANOVA) were conducted to answer research question 1. Independent samples t-test analysis was applied to analyze whether there were any significant differences in the dimensions of online learning self-efficacy (Table 3) and online self-regulated learning (Table 4) according to gender (1 – male, 2 – female), age group (1 – below 20 years old, 2 – 20 years old or above), current semester (1 – semester 1 or 2, 2 – semester 3 or higher), and students' status (1 – non-graduating, 2 – graduating). Meanwhile, one-way ANOVA was applied to examine for any differences in online learning self-efficacy and online self-regulated learning across the disciplines of study (1 – management sciences, 2 – social sciences and humanities, 3 – science and technology) and internet connectivity (1 – poor, 2 – average, 3 – good).

Table 3: Independent Samples T-Test and One-Way ANOVA Results of Demographic Characteristics on Online Learning Self-Efficacy Dimensions

Online learning self-efficacy dimension	Gender						Age group					
	Male (n = 121)		Female (n = 321)		t	Sig	Below 20 years (n = 282)		20 years or above (n = 160)		t	Sig
	Mean	SD	Mean	SD			Mean	SD	Mean	SD		
Self-efficacy in computer and internet	4.09	0.628	4.12	0.605	-0.502	0.616	4.16	0.575	4.03	0.662	**2.161***	**0.031**
Self-efficacy in an online learning environment	3.84	0.682	3.81	0.652	0.471	0.638	3.83	0.626	3.78	0.715	0.845	0.399
Self-efficacy in time management	3.87	0.695	4.00	0.666	-1.744	0.082	4.05	0.635	3.81	0.728	**3.222*****	**0.001**
Self-efficacy to interact with lecturers for online courses	3.89	0.768	3.85	0.721	0.498	0.619	3.90	0.736	3.84	0.719	1.254	0.211
Self-efficacy to interact socially with classmates	3.95	0.789	4.03	0.698	-1.113	0.266	4.07	0.696	3.77	0.794	**2.840****	**0.005**
Self-efficacy to interact academically with classmates	3.96	0.697	4.03	0.653	-1.077	0.282	4.08	0.646	3.90	0.686	**2.729****	**0.007**
Online learning self-efficacy dimension	Semester of study						Students' status					
	1 or 2 (n = 256)		3 or higher (n = 186)		t	Sig	Non-graduating (n = 356)		Graduating (n = 86)		t	Sig
	Mean	SD	Mean	SD			Mean	SD	Mean	SD		
Self-efficacy in computer and internet	4.17	0.591	4.04	0.631	**2.199***	**0.028**	4.13	0.599	4.04	0.654	1.211	0.227
Self-efficacy in an online learning environment	3.85	0.629	3.76	0.697	1.443	0.150	3.82	0.644	3.81	0.724	0.107	0.915
Self-efficacy in time management	4.05	0.642	3.84	0.702	**3.262*****	**0.001**	3.99	0.661	3.85	0.726	1.703	0.089
Self-efficacy to interact with lecturers for online courses	3.94	0.696	3.76	0.772	**2.523***	**0.012**	3.90	0.713	3.70	0.795	**2.276***	**0.023**
Self-efficacy to interact socially with classmates	4.11	0.671	3.88	0.773	**3.293*****	**0.001**	4.07	0.699	3.78	0.783	**3.346*****	**0.001**
Self-efficacy to interact academically with classmates	4.10	0.642	3.90	0.681	**3.176****	**0.002**	4.06	0.658	3.82	0.666	**2.994****	**0.003**
Online learning self-efficacy dimension	Discipline of study								Post Hoc Test			
	MS (n = 274)		SSH (n = 91)		S&T (n = 77)		F (2, 439)	p-value	Multiple comparisons (Tukey HSD)			
	Mean	SD	Mean	SD	Mean	SD						
Self-efficacy in computer and internet	4.13	0.584	4.12	0.628	4.03	0.682	0.866	0.421	NS			
Self-efficacy in an online learning environment	3.81	0.637	3.89	0.683	3.73	0.704	1.299	0.274	NS			

Self-efficacy in time management	4.01	0.665	3.90	0.691	3.89	0.691	1.339	0.263	NS
Self-efficacy to interact with lecturers for online courses	3.87	0.718	3.93	0.705	3.79	0.817	0.791	0.454	NS
Self-efficacy to interact socially with classmates	4.04	0.668	4.08	0.775	3.83	0.825	**3.092***	**0.046**	NS
Self-efficacy to interact academically with classmates	4.04	0.649	4.08	0.687	3.83	0.676	**3.524***	**0.030**	**MS > S&T*** **SSH > S&T***
Online learning self-efficacy dimension	Internet connectivity								Post Hoc Test
	Poor (n = 31)		Average (n = 199)		Good (n = 212)		F (2, 439)	p-value	Multiple comparisons (Tukey HSD)
	Mean	SD	Mean	SD	Mean	SD			
Self-efficacy in computer and internet	3.77	0.602	4.03	0.610	4.24	0.581	**12.307****	**0.000**	**Good > Poor**** and Good > Average***
Self-efficacy in an online learning environment	3.73	0.583	3.69	0.667	3.95	0.639	**8.672****	**0.000**	**Good > Average****
Self-efficacy in time management	3.76	0.635	3.80	0.699	4.15	0.610	**16.006****	**0.000**	**Good > Poor*** and Good > Average****
Self-efficacy to interact with lecturers for online courses	3.73	0.645	3.72	0.759	4.02	0.692	**9.407****	**0.000**	**Good > Average****
Self-efficacy to interact socially with classmates	3.85	0.644	3.90	0.779	4.14	0.660	**6.292****	**0.002**	**Good > Average****
Self-efficacy to interact academically with classmates	3.81	0.596	3.93	0.703	4.12	0.621	**6.288****	**0.002**	**Good > Poor* and Good > Average****

**p < 0.05 **p < 0.01 ***p < 0.001 NS – not significant*
MS – Management Science
SSH – Social science & humanities
S&T – Science & technology

Table 4: Independent Samples T-Test and One-Way Anova Results of Demographic Characteristics on Online Self-Regulated Learning Dimensions

Online self-regulated learning dimension	**Gender**						**Age group**					
	Male (n = 121)		**Female (n = 321)**		**t**	**Sig**	**Below 20 years (n = 282)**		**20 years or above (n = 160)**		**t**	**Sig**
	Mean	**SD**	**Mean**	**SD**			**Mean**	**SD**	**Mean**	**SD**		
Goal setting	3.90	0.739	4.04	0.653	-1.897	0.059	4.08	0.620	3.84	0.762	**3.276*****	**0.001**
Environment structuring	3.93	0.770	4.05	0.737	-1.518	0.130	4.10	0.686	3.85	0.844	**3.028****	**0.003**
Task strategies	3.60	0.823	3.80	0.669	**-2.338***	**0.020**	3.82	0.662	3.60	0.813	**2.765****	**0.006**
Time management	3.80	0.761	3.84	0.716	-0.539	0.590	3.89	0.686	3.69	0.797	**2.576***	**0.011**
Help-seeking	3.85	0.783	3.95	0.682	-1.362	0.174	3.99	0.664	3.83	0.785	**2.046***	**0.042**
Self-evaluation	3.87	0.690	3.94	0.698	-0.918	0.359	4.02	0.614	3.75	0.801	**3.404*****	**0.001**
Online self-regulated learning dimension	Semester of study				t	Sig	Students' status				t	Sig
	1 or 2 (n = 256)		3 or higher (n = 186)				Non-graduating (n = 356)		Graduating (n = 86)			
	Mean	SD	Mean	SD			Mean	SD	Mean	SD		

Goal setting	4.07	0.641	3.91	0.721	**2.406***	**0.017**	4.02	0.658	3.90	0.758	1.398	0.165
Environment structuring	4.10	0.692	3.91	0.806	**2.515***	**0.012**	4.03	0.736	3.98	0.794	0.529	0.597
Task strategies	3.81	0.686	3.65	0.755	**2.220***	**0.027**	3.77	0.684	3.62	0.840	1.578	0.117
Time management	3.88	0.688	3.75	0.775	1.920	0.056	3.85	0.703	3.72	0.819	1.367	0.174
Help-to seek	3.96	0.682	3.88	0.750	1.285	0.200	3.95	0.697	3.84	0.767	1.260	0.208
Self-evaluation	4.01	0.629	3.80	0.764	**2.967****	**0.003**	3.95	0.646	3.80	0.867	1.485	0.140
Online self-regulated learning dimension	Discipline of study								Post Hoc Test			
	MS (n = 274)		SSH (n = 91)		S&T (n = 77)		F (2, 439)	Sig	Multiple comparisons (Tukey HSD)			
	Mean	SD	Mean	SD	Mean	SD						
Goal setting	4.02	0.643	4.04	0.711	3.86	0.754	2.036	0.132	NS			
Environment structuring	4.02	0.728	4.10	0.737	3.90	0.818	1.478	0.229	NS			
Task strategies	3.77	0.696	3.80	0.704	3.56	0.794	2.949	0.053	NS			
Time management	3.84	0.718	3.87	0.686	3.73	0.809	0.865	0.422	NS			
Help-seeking	3.95	0.699	4.01	0.682	3.74	0.765	**3.533***	**0.030**	**SSH > S&T***			
Self-evaluation	3.97	0.654	3.99	0.648	3.68	0.835	**6.011****	**0.003**	**MS > S&T** and SSH > S&T****			
Online self-regulated learning dimension	Internet connectivity								Post Hoc Test			
	Poor (n = 31)		Average (n = 199)		Good (n = 212)		F (2, 439)	Sig	Multiple comparisons (Tukey HSD)			
	Mean	SD	Mean	SD	Mean	SD						
Goal setting	3.73	0.695	3.92	0.713	4.11	0.624	**6.987*****	**0.001**	**Good > Poor** and Good > Average****			
Environment structuring	3.71	0.708	3.92	0.785	4.16	0.688	**8.474******	**0.000**	**Good > Poor** and Good > Average****			
Task strategies	3.63	0.674	3.64	0.719	3.86	0.710	**5.237****	**0.006**	**Good > Average****			
Time management	3.72	0.700	3.71	0.727	3.95	0.714	**6.441****	**0.002**	**Good > Average****			
Help-seeking	3.72	0.657	3.86	0.717	4.02	0.704	**4.065***	**0.018**	NS			
Self-evaluation	3.71	0.609	3.83	0.713	4.04	0.673	**6.364****	**0.002**	**Good > Poor* and Good > Average****			

**p < 0.05 **p < 0.01 ***p < 0.001 NS – Not significant*
MS – Management Science
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There were no significant gender differences in online learning self-efficacy scores for all six dimensions. However, there was a significant gender difference for task strategies ($t = -2.338$, $p < 0.05$) of online self-regulated learning but no significant gender differences for other online self-regulated learning dimensions. Female students (mean = 3.80, SD = 0.669) exhibited higher scores in task strategies than males (mean = 3.60, SD = 0.823) as shown in Table 3. Age group showed significant differences in four online learning self-efficacy dimensions; self-efficacy in computer and internet, self-efficacy in time management, self-efficacy to interact socially with classmates, and self-efficacy to interact academically with classmates. Younger students of age below 20 years old showed significantly higher scores in computer and internet self-efficacy ($t = 2.161$, $p < 0.05$), self-efficacy in time management ($t = 3.222$, $p < 0.001$), self-efficacy to interact socially with classmates ($t = 2.840$, $p < 0.01$), self-efficacy to interact academically with classmates ($t = 2.729$, $p < 0.01$) than older age students. Students of age below 20 years also showed significantly high scores in all online self-regulated learning dimensions compared to older age students.

Semester of study showed significant differences in five of online learning self-efficacy dimensions; self-efficacy in computer/internet ($t = 2.199$, $p < 0.05$), self-efficacy in time management ($t = 3.262$, $p < 0.001$), self-efficacy to interact with lecturers for online courses ($t = 2.523$, $p < 0.05$), self-efficacy to interact socially with classmates ($t = 3.293$, $p < 0.001$), and self-efficacy to interact academically with classmates ($t = 3.176$, $p < 0.01$) and four of online self-regulated learning dimensions; goal setting ($t = 2.406$, $p < 0.05$), environment structuring ($t = 2.515$, $p < 0.01$), task strategies ($t = 2.220$, $p < 0.05$), and self-evaluation ($t = 2.967$, $p < 0.01$). Students in lower semesters; 1 or 2, showed higher scores in the five online learning self-efficacy dimensions and the four online self-regulated learning dimensions than their counterparts in higher semesters (3 or higher). Non-graduating students had significantly higher scores in self-efficacy to interact with lecturers on

online courses (t = 2.276, p < 0.05), self-efficacy to interact socially with classmates (t = 3.346, p < 0.001), and self-efficacy to interact academically with classmates (t = 2.994, p < 0.01) than graduating students. With regards to online self-regulated learning, none of the dimensions differed significantly across students' status. Tables 3 and 4 present the results. The discipline of the study showed significant differences in two online learning self-efficacy dimensions; self-efficacy to interact with classmates (F(2, 439) = 3.092, p < 0.05), and self-efficacy to interact academically with classmates (F(2, 439) = 3.524, p < 0.05) and two online self-regulated learning; help-seeking (F(2, 439) = 3.533, p < 0.05) and self-evaluation (F(2, 439) = 6.011, p < 0.01) as shown in Table 3 and 4.

Students with good internet connectivity exhibited significantly higher self-efficacy in computer/internet (F(2, 439) = 12.307, p < 0.0005), self-efficacy in time management (F(2, 439) = 16.006, p < 0.0005), self-efficacy to interact academically with classmates (F(2, 439) = 6.288, p < 0.01), goal setting (F(2, 439) = 6.987, p < 0.0005), environment structuring (F(2, 439) = 8.474, p < 0.0005), and self-evaluation (F(2, 439) = 6.364, p < 0.01) were shown to have significant differences among students with good internet connectivity compared to average and poor internet connectivity. Meanwhile, self-efficacy in the online learning environment (F(2, 439) = 8.672, p < 0.0005), self-efficacy to interact with lecturers for online courses (F(2, 439) = 9.407, p < 0.0005), self-efficacy to interact socially with classmates (F(2, 439) = 6.292, p < 0.01), task strategies (F(2, 439) = 5.237, p < 0.01), and time management were revealed to have significant differences among students with good internet connectivity compared to average internet connectivity. Results are shown in Table 3 and Table 4.

Help-seeking for online self-regulated learning was significantly (F(2, 439) = 3.533, p < 0.05) higher among social science and humanities (mean = 4.08, SD = 0.775) students than science and technology students (mean = 3.74, SD = 0.765). Management science (mean = 4.04, SD = 0.649) as well as social science and humanities (mean = 4.08, SD = 0.687) students exhibited significantly higher self-efficacy in interacting with classmates academically than science and technology (mean = 3.83, SD = 0.676) students. Self-evaluation for online self-regulated learning was significantly higher (F = 6.011, p < 0.01) among both management science (mean = 3.97, SD = 0.654) as well as social science and humanities (mean = 3.99, SD = 0.648) compared to students in science and technology (mean = 3.68, SD = 0.835) discipline of study as shown in Table 4. The study also examined the effect of internet connectivity on online learning self-efficacy and online self-regulated learning. All online learning self-efficacy and online self-regulated learning dimensions had significant differences across good, average, and poor internet connectivity.

When examining overall online learning self-efficacy and overall self-regulated learning, it was found that younger students of ages below 20 years old, students from lower semesters of 1 or 2, and students with average to good internet connectivity exhibited significant higher in both online learning self-efficacy and online self-regulated learning. Students from management sciences social sciences and humanities showed higher online self-regulated learning in comparison to science and technology students. Non-graduating students tended to have higher online self-efficacy scores compared to graduating students. However, online self-regulated learning did not show significant differences across students' statuses. Gender is the only element that did not show significant differences both in overall online learning self-efficacy and overall self-regulated learning. All results are presented in Table 5.

Table 5: Descriptive Statistics and One-Way Anova of Demographic Characteristics on Overall Online Learning Self-Efficacy and Online Self-Regulated Learning

Variable	Sub-variable	n	Overall online learning self-efficacy				Overall online self-regulated learning			
			Mean	SD	t/F values	Sig	Mean	SD	t/F	Sig
Gender	Male	121	3.93	0.630	-0.656	0.512	3.90	0.739	-1.897	0.059
	Female	321	3.98	0.576			4.04	0.653		
Age group	Below 20 years	282	4.02	0.568	**2.537***	**0.012**	3.98	0.541	**3.311*****	**0.001**
	20 years or above	160	3.87	0.621			3.76	0.697		
Semester of study	1 or 2	256	4.04	0.567	**3.077****	**0.002**	3.97	0.563	**2.597****	**0.010**
	3 or higher	186	3.86	0.610			3.82	0.652		
Students' status	Non-graduating	356	3.99	0.576	**2.263***	**0.024**	3.93	0.576	1.434	0.154
	Graduating	86	3.83	0.637			3.81	0.713		
Discipline of study	Management Science	274	3.98	0.569	1.753	0.174	3.93	0.583	**3.455***	**0.032**
	Social science and	91	4.00	0.607			3.97	0.598		

	humanities									
	Science and technology		77	3.85	0.643			3.75	0.674	
	Post hoc test (Multiple comparison)					NS				**MS > S&T*** **SSH > S&T***
	Poor		31	3.77	0.533	**12.146****	**0.000**	3.70	0.608	
	Average		199	3.84	0.596			3.81	0.610	**8.418****	**0.000**
Internet connectivity	Good		212	4.10	0.564			4.02	0.581	
	Post hoc test (Multiple comparison)					**Good > Poor**** **Good > Average******				**Good > Poor**** **Good > Average******

*$p < 0.05$ **$p < 0.01$ ***$p < 0.001$ ***$p < 0.0005$ NS – Not significant*

Discussion: One of the aims of this current study was to investigate dimensions of self-efficacy and self-regulated learning in the online learning environment. The study adapted (Shen et al., 2013), (Zimmerman & Kulikowich, 2016) for online learning self-efficacy and (Barnard et al., 2009) for online self-regulated learning dimensions. The present study focused on six dimensions of online learning self-efficacy and six dimensions of online self-regulated learning. The six dimensions of online learning self-efficacy cover the three main aspects; technology, learning, and social interaction as emphasized by Shen et al. (2013) and Ithriah et al., 2020). The study concluded that students exhibited high levels of online learning self-efficacy, online self-regulated learning as well and online learning satisfaction. The result was consistent with (Shen et al., 2013) who studied online learning self-efficacy and online learning satisfaction and in line with (Ulfatun et al., 2021) who studied online learning self-efficacy and online self-regulated learning.

Demographic variables including gender, age group, semester of study, students' status, discipline of study, and internet connectivity showed significant differences in online learning self-efficacy and online self-regulated learning to some extent. First, gender did not show a significant difference in any of the online learning self-efficacy dimensions which was consistent with studies by (Samruayruen et al., 2013), (Yavuzalp & Bahcivan, n.d.), (Y.-C. Kuo & Tseng, n.d.), and (Kurniawan et al., 2022) that found no significant difference in the students' self-efficacy across gender but inconsistent with the studies by (Shen et al., 2013), (Jan, 2015), and (Julaihi et al., 2022) that showed females exhibited higher self-efficacy than their male counterparts. The current study only found that there was gender significant difference in task strategies of online self-regulated learning. The result demonstrated that female students had higher scores in task strategies than male students which were approximately consistent with the study by (Altun & Erden, 2013) who found that effort regulation was a significant predictor for online self-regulated learning among female students. However, the result was inconsistent with the study by (Appiah-Kubi et al., 2022) for which they found that male students had more self-regulated learning capacities than their female counterparts while Liu et al., 2021) found that females performed better than males in all three constructs (preparatory, performance, and appraisal) of learners' online self-regulated learning. Overall, the current study revealed no gender differences for both online learning self-efficacy and online self-regulated learning. The possible explanation is that both male and female students have good online learning readiness factors which makes them accept online learning as the mode of learning.

Second, younger students of ages below 20 years old showed significantly higher self-efficacy in computer and internet, self-efficacy in time management, self-efficacy to interact socially with classmates, and self-efficacy to interact academically with classmates than older age (20 years or above) students. The result was inconsistent with the study by (Samruayruen et al., 2013) who found no age difference in self-efficacy. Students of ages below 20 years old also showed significantly high scores in all online self-regulated learning dimensions compared to older age students. This finding indicated that younger age students had higher extrinsic motivation levels which may be because they just entered and experienced studying in university and they have high motivation to work hard and self-regulate learning for success, but as the age increases, they may steer away from this motivational level because of several different reasons such as experiences and expectations that had fall behind (Keskin & Korkutata, 2018).
Third, students in lower semesters; 1 or 2, showed to have higher scores in the five online learning self-efficacy dimensions; self-efficacy in computer/internet, self-efficacy in time management, self-efficacy to interact with lecturers for online courses, self-efficacy to interact socially with classmates, and self-efficacy to

interact academically with classmates. Students in these semesters also showed higher scores in four online self-regulated learning dimensions; goal setting, environment structuring, task strategies, and self-evaluation. Overall, students in lower semesters; 1 or 2, were likely to exhibit higher online learning self-efficacy which was inconsistent with studies by (Limiansi & Hadi, 2022), (Yavuzalp & Bahcivan, n.d.), and online self-regulated learning. The possible reason is, that students in lower semesters; 1 or 2, were those students who just entered the university with high levels of excitement and motivation to learn for success (Keskin & Korkutata, 2018).

Fourth, non-graduating students had significantly higher scores in self-efficacy to interact with lecturers on online courses, self-efficacy to interact socially with classmates, and self-efficacy to interact academically with classmates than graduating students. The possible reason for this was that 356 non-graduating (80.5%) students and 256 students (71.9%) were semester 1 or 2 students and these lower semester students were likely to have higher active social interactions among students and lecturers. The nature of online learning requires students to interact actively with both lecturers and classmates (Shen et al., 2013). Fifth, discipline of study was a significant factor in self-efficacy to interact socially with classmates and self-efficacy to interact academically with classmates. Overall, the discipline of the study had no significant difference with online learning self-efficacy, which was consistent with the studies (Limiansi & Hadi, 2022) and (Yavuzalp & Bahcivan, n.d.) who found no significant difference in self-efficacy between the disciplines of study. In the current study, the discipline of the study had significant differences in self-efficacy to interact socially and academically with classmates.

In other words, management science social science and humanities students tended to have higher levels of self-efficacy to interact socially and academically with classmates than their science and technology counterparts. The possible explanation for this situation is, that management science social science and humanities students are likely to interact more with peers compared to science and technology students. This was verified when online learning enhanced interaction with peers more among management science social science and humanities students. An independent sample t-test of mean score on online learning had enhanced interaction with peers by the discipline of study was significantly ($t = 2.222$, $p < 0.05$) higher among management science and social science and humanities (mean = 3.83, SD = 0.931) than science and technology (mean = 3.53, SD = 1.095) students. Last, average to good internet connectivity was a significant factor for all online learning self-efficacy and online self-regulated learning dimensions. Overall, students with good internet connectivity were likely to have high online learning self-efficacy beliefs and high online self-regulated learning strategies. In the current study, by follow-up analysis, good internet connectivity showed significance in students' online learning satisfaction ($F(2, 439) = 11.806$, $p < 0.0005$) but not significant ($F(2, 432) = 0.084$, $p > 0.05$) in academic performance. Having good internet connectivity motivates students to use online learning. Online learning self-efficacy has a positive and significant relationship with the use of online learning (Ithriah et al., 2020).

5. Conclusion

Many studies have focused on self-efficacy in technology but little research has been done on self-efficacy other than technology factors (Alqurashi, 2016) and he recommended developing research not only on technology but also on other dimensions such as learning, interaction and collaborative skills as these aspects together are important to be considered when measuring self-efficacy in online learning settings. However, the current study only explored the dimensions of online learning self-efficacy in three aspects of online learning settings; technology, learning, and interaction.

The study found age and internet connectivity differences in online learning self-efficacy as well as online self-regulated learning. This finding will contribute to the existing online learning study involving age and internet connectivity differences in self-efficacy and self-regulated learning. The current study demonstrates that self-efficacy in time management and environment structuring most significantly explain variances in online learning satisfaction. Follow-up analysis showed that self-efficacy in time management was significant and strongly positively correlated with the environment structuring (Pearson's correlation coefficient, $r = 0.612$, $p < 0.0005$). These findings signal students' self-judgment about their capabilities to complete an online course and environment structuring is critical for their satisfaction with an online course. In addition,

lecturers' proactive approaches are important in monitoring and encouraging social interactions either with classmates or lecturers, developing task strategies, and establishing self-evaluation to help students in the development of online learning self-efficacy as well as online self-regulated learning.

The findings in this study provide evidence to improve students' online learning self-efficacy and students' online self-regulated learning and ultimately their academic success. As the finding showed the significance of digital technologies in self-regulated learning, university lecturers should incorporate digital technologies into the learning process such that self-efficacy and self-regulated learning among students. For subsequent enhancement in the quality of online learning, this study provides insights for future research, especially in all areas related to the developments of students' online learning self-efficacy and students' online self-regulated learning abilities as well as the improvement of facilities and infrastructure in both face-to-face and online learning environments.

Acknowledgment: The authors would like to thank the Universiti Teknologi MARA Cawangan Melaka for supporting this article.

References

Abdul Halim, B., Zainudin, S. N., Fuzi, S. F., Jama, S. R., Zahidi, N. E. & Wan Hassan, W. H. (2022). Online distance learning readiness among students: a comparative study between mathematics and statistics courses. *Jurnal Intelek*, 17(1), 63-71.

Alqurashi, E. (2016). Self-efficacy in online learning environments: A literature review. *Contemporary Issues in Education Research (CIER)*, 9(1), 45-52.

Altun, S. & Erden, M. (2013). Self-regulation-based learning strategies and self-efficacy perceptions as predictors of male and female students' mathematics achievement. *Procedia-Social and Behavioral Sciences*, 106, 2354-2364.

Appiah-Kubi, E., Amponsah, M. O., Nti-Adarkwah, S. & Collins, A. (2022). Assessing the Influence of Gender on Self-Regulated Learning and Academic Engagement among Senior High School Students in Ghana. *European Journal of Educational and Development Psychology*, 10(2), 28-41.

Bandura, A. & Ramachaudran, V. S. (1994). Encyclopedia of human behavior. *New York: Academic Press,* 4, 71-81.

Barnard, L., Lan, W. Y., To, Y. M., Paton, V. O. & Lai, S. L. (2009). Measuring self-regulation in online and blended learning environments. *The internet and higher education,* 12(1), 1-6.

Cho, M. H. & Kim, B. J. (2013). Students' self-regulation for interaction with others in online learning environments. *The Internet and Higher Education*, 17, 69-75.

Haynes, J. C., Hainline, M. S. & Sorensen, T. (2018). A measure of self-regulated learning in online agriculture courses. *Journal of Agricultural Education*, 59(1), 153-170.

Edisherashvili, N., Saks, K., Pedaste, M. & Leijen, Ä. (2022). Supporting self-regulated learning in distance learning contexts at higher education level: systematic literature review. *Frontiers in Psychology*, 12, 792422.

Mayda, M. H., Erail, S. & Karaduman, E. (2020). Examination of self-regulated online learning skills in faculty of sports sciences students. *European Journal of Education Studies,* 7(11).

Hodges, C. B. (2008). Self-efficacy in the context of online learning environments: A review of the literature and directions for research. *Performance Improvement Quarterly,* 20(3-4), 7-25.

Ithriah, S. A., Ridwandono, D. & Suryanto, T. L. M. (2020, July). Online learning self-efficacy: The role in e-learning success. *In Journal of Physics: Conference Series,* 1569(2), 022053). IOP Publishing.

Jan, S. K. (2015). The relationships between academic self-efficacy, computer self-efficacy, prior experience, and satisfaction with online learning. *American Journal of Distance Education*, 29(1), 30-40.

Julaihi, N. H., Zainuddin, P. F. A., Nor, R. C. M., Bakri, S. R. A., Hamdan, A., Salleh, J. & Bujang, N. (2022). Self-Efficacy in Learning Mathematics Online. *Journal of Cognitive Sciences and Human Development*, 8(1), 139-156.

Kamali, M. & Bagheri-Nesami, M. (2022). The association between online self-regulated learning and E-learning acceptance among medical sciences students during the COVID-19 pandemic. *Journal of Nursing and Midwifery Sciences,* 9(3), 219.

Kellenberg, F., Schmidt, J. & Werner, C. (2017). The adult learner: Self-determined, self-regulated, and reflective. *Signum Temporis*, 9(1), 23.

Keskin, Ö. & Korkutata, A. (2018). Reviewing Academic Motivation Levels of Students Study in Different Faculties in Terms of Certain Variables (Sakarya University Case). *Journal of Education and e-Learning Research,* 5(2), 208-216.

Kuo, Y. C., Tseng, H. & Kuo, Y. T. (2020, April). Internet self-efficacy, self-regulation, and student performance: African-American adult students in online learning. In International Journal on E-Learning (pp. 161-180). Association for the Advancement of Computing in Education (AACE).

Kurniawan, C., Soepriyanto, Y., Zakaria, Z. & Aulia, F. (2022, March). Gender Differences in E-Learning Self-Efficacy during Pandemic Covid-19. In 2nd World Conference on Gender Studies (WCGS 2021) (pp. 79-83). Atlantis Press.

Limiansi, K. & Hadi, S. (2022, January). Students Self-Efficacy Profile in Online Learning. In 5th International Conference on Current Issues in Education (ICCIE 2021) (pp. 85-90). Atlantis Press.

Liu, X., He, W., Zhao, L. & Hong, J. C. (2021). Gender differences in self-regulated online learning during the COVID-19 lockdown. *Frontiers in Psychology*, 12, 752131.

Oates, S. (2019, September). The importance of autonomous, self-regulated learning in primary initial teacher training. *In Frontiers in Education,* 4, 102). Frontiers Media SA.

Peechapol, C., Na-Songkhla, J., Sujiva, S. & Luangsodsai, A. (2018). An exploration of factors influencing self-efficacy in online learning: A systematic review. *International Journal of Emerging Technologies in Learning (Online)*, 13(9), 64.

Samruayruen, B., Enriquez, J., Natakuatoong, O. & Samruayruen, K. (2013). Self-regulated learning: A key of a successful learner in online learning environments in Thailand. *Journal of Educational Computing Research*, 48(1), 45-69.

Santoso, H. B., Riyanti, R. D., Prastati, T., Susanty, A. & Yang, M. (2022). Learners' online self-regulated learning skills in Indonesia Open University: *Implications for policies and practice. Education Sciences,* 12(7), 469.

Shen, D., Cho, M. H., Tsai, C. L. & Marra, R. (2013). Unpacking online learning experiences: Online learning self-efficacy and learning satisfaction. *The Internet and Higher Education*, 19, 10-17.

Stephen, J. S. & Rockinson-Szapkiw, A. J. (2021). A high-impact practice for online students: the use of a first-semester seminar course to promote self-regulation, self-direction, online learning self-efficacy. *Smart Learning Environments,* 8(1), 6.

Ulfatun, T., Septiyanti, F. & Lesmana, A. G. (2021). University students' online learning self-efficacy and self-regulated learning during the COVID-19 pandemic. *International Journal of Information and Education Technology*, 11(12), 597-602.

Yavuzalp, N. & Bahcivan, E. (2020). The online learning self-efficacy scale: Its adaptation into Turkish and interpretation according to various variables. *Turkish Online Journal of Distance Education,* 21(1), 31-44.

Yot-Domínguez, C. & Marcelo, C. (2017). University students' self-regulated learning using digital technologies. *International Journal of Educational Technology in Higher Education,* 14(1), 1-18.

Zhao, H., Chen, L. & Panda, S. (2014). Self-regulated learning ability of C Chinese distance learners. *British Journal of Educational Technology,* 45(5), 941-958.

Zimmerman, B. J. (1990). Self-regulated learning and academic achievement: An overview. *Educational psychologist*, 25(1), 3-17.

Zimmerman, B. J. (2000). Self-efficacy: An essential motive to learn. *Contemporary educational psychology,* 25(1), 82-91.

Zimmerman, W. A. & Kulikowich, J. M. (2016). Online learning self-efficacy in students with and without online learning experience. *American Journal of Distance Education,* 30(3), 180-191.