

BARRIERS TO ACADEMIC ENGAGEMENT IN ONLINE HIGHER EDUCATION: THE ROLE OF COMMUNICATION, DIGITAL SKILLS, AND PSYCHOLOGICAL WELL-BEING

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Abstract

Online higher education has expanded rapidly, yet maintaining meaningful academic engagement remains challenging for many students. This study examined the relationships between academic engagement, communication quality, digital competence, and psychological distress among students participating in online higher education. Data were collected from 100 participants using standardized self-report questionnaires and analysed through descriptive statistics, Pearson correlation, and multiple linear regression. Academic engagement was comparatively low ($M = 2.84 \pm 0.65$), despite relatively favourable levels of communication quality ($M = 3.44 \pm 0.67$) and digital competence ($M = 3.51 \pm 0.62$). Academic engagement showed a significant positive association with communication quality ($r = 0.52, p < 0.01$) and digital competence ($r = 0.47, p < 0.01$), whereas psychological distress was negatively associated with engagement ($r = -0.38, p < 0.01$). The regression model was statistically significant ($F(3,96) = 18.34, p < 0.001$) and explained 36% of the variance in academic engagement. Communication quality emerged as the strongest predictor ($\beta = 0.38, p < 0.001$), followed by digital competence ($\beta = 0.26, p = 0.008$), while psychological distress showed a significant negative contribution ($\beta = -0.22, p = 0.012$). Overall, the findings indicate that academic engagement in online higher education is shaped by interconnected relational, technological, and psychological conditions. Strengthening communication between students and instructors, improving digital competence, and providing accessible psychological support may help create more engaging and supportive online learning environments.

INTRODUCTION

The growth of higher education online has increased, and there are now more opportunities regarding flexibility and access for different learners since COVID-19. This change in learning from traditional learning has, however, been related to decreased academic engagement

and dropout rates and increased demotivation among learners (Dhawan, 2020; Kahu et al., 2018). Academic engagement is about behavioral, emotional, and cognitive involvement in learning and is associated with student success and satisfaction. In online settings, factors such as less interaction, less feedback, and a sense of isolation

can cause a student to become disengaged, and a variety of psychological, technological, and pedagogical causes contribute to disengagement (Fredricks et al., 2004; Dixon, 2015; Bond et al., 2020).

CBT is a useful tool to address these issues because students will have the opportunity to identify negative thinking and practice coping skills and study techniques to manage their emotions and academic performance (Beck, 2011; Hofmann et al., 2012). Self-determination theory (SDT) also explains engagement based on the three ingredients of autonomy, competence, and relatedness, all of which can be fostered through CBT-based interventions that enhance skills and structured interaction (Deci & Ryan, 2000). Other challenges include communication issues, such as limited communication, and different digital skills, which can lead to misunderstandings, frustration, and disenfranchisement from online learning (Bolliger & Martin, 2018; van Laar et al., 2017).

Overall, this study explores factors that impede engagement in online higher education, psychological well-being, communication, and digital skills and the prospective of CBT-informed strategies to support engagement in learning.

The period of rapid growth of online higher education during COVID-19 has greatly changed the way teaching and learning are delivered globally. The potential for online learning to be more accessible and flexible comes with its own set of challenges that can have negative effects on student engagement. Academic engagement includes behavior, emotion and thoughts that are invested in learning activities (Fredricks et al., 2004) and is a key predictor of academic success, satisfaction and retention in the higher education setting. The online environment can, however, present challenges to engagement, including a lack of face-to-face interaction, technical issues and psychological stressors (Bond et al., 2020; Kahu et al., 2018).

These are examined as individual predictors of engagement, but few studies examine the combined predictive power of these predictors. It

is important to have a clear understanding of relational, technological and psychological connections to develop evidence-informed practices of engagement, retention and student success in online higher education (Bond et al., 2020; Kahu et al., 2021). The purpose of this study is to determine whether the quality of communication, digital skills and psychological well-being are important factors when predicting academic engagement for students taking online higher education programs.

Materials and Methods

Data Collection

Data were collected using standardized self-report questionnaires administered online. The Online Student Engagement Scale (OSE) measured behavioral, emotional, and cognitive engagement using a 5-point Likert scale, demonstrating strong reliability and validity. The Communication Satisfaction Questionnaire (Educational Version) assessed perceptions of communication quality, including clarity, feedback, and interaction, with higher scores indicating greater satisfaction. Digital skills were assessed using the Digital Competence Scale, which measures operational, informational, and communication-related abilities, reflecting greater competence. Responses are rated on a 5-point Likert scale, indicating greater satisfaction.

Psychological Analysis

Psychological well-being was measured using the Depression Anxiety Stress Scales (DASS-21), which assesses symptoms of depression, anxiety and stress over the past week and has demonstrated strong psychometric properties. Participants rated the extent to which they experienced each symptom over the past week on a 4-point scale.

A demographic questionnaire collected information on age, gender, level of study, field of study, mode of study, and previous online learning experience. These variables were included to support contextual interpretation, as demographic factors may influence engagement and digital competence in online learning

environments. All demographic data were analysed at the group level to ensure anonymity and alignment with ethical guidelines. Gender data are collected to allow exploration of potential demographic trends and to ensure compatibility with existing research in educational and psychological studies.

These variables were analysed only at the group level and will not be used to identify participants. Their inclusion supports the inclusion interpretation of findings and aligns with standard practice in quantitative educational research (British Psychological Society [BPS] 2021).

Procedure

Recruitment advertisements containing a brief description of the study and a survey link were distributed electronically, including via the researcher's social media (Facebook profile), to reach participants engaged in online higher education. Upon accessing the survey, participants were presented with a Participants information sheet (PIS), consent form, debrief form, detailing the studies purpose, procedure, risks, benefit, confidentiality, and their right to withdraw before submission of survey link (BPS,2021).

Participants provided informed consent electronically before proceeding. The survey was hosted on a secure platform (QuestionPro) and took 10-15 minutes to complete. Data were collected using standardized self-report questionnaires administered online, including a demographic questionnaire, the Online Student Engagement Scale, the Communication Satisfaction questionnaire, the Digital Competence Scale, and the DASS-21. The order of administration was structured to reduce potential priming effects, where earlier questions could influence responses to later items by activating related thoughts or biases. This sequencing was intended to minimize response bias and improve the validity of the collected data.

A debrief page was provided in the survey debrief form, which included study information and

contact details for university well-being services and external safeguarding and support organizations. All data were anonymized at the point of collection and stored securely on the University's instructed one drive system, with access restricted to the researcher and supervisor in accordance with data protection (UK General Data Protection Regulation GDPR) and ethical guidelines.

Data Analysis

Data were analysed using JASP, an open-source statistical software widely used in psychological research for its user-friendly interface and robust analytical capabilities. The JASP was selected because it provides a comprehensive range of statistical techniques suitable for examining relationships between communication, digital skills, psychological well-being, and academic engagement. Its transparency and reproducibility further support the reliability and validity of the analysis.

Descriptive statistics were computed to summarize the key features of the data, including the mean, standard deviation, and distributional properties of each variable. This allowed for the assessment of normality, identification of potential outliers, and checking of assumptions for parametric testing. Inferential analyses were then conducted to examine relationships between variables and to assess the predictive contribution of communication quality, digital skills, and psychological well-being to academic engagement.

To further examine these relationships, multiple regression analysis was conducted. Multiple regression is a statistical technique that assesses the extent to which multiple predictor variables explain variance in a single outcome variable while also determining the relative contribution of each predictor.

Overall, the chosen research design provides a systematic and theoretically grounded framework for examining the relationship between key variables associated with academic engagement in online learning environments. It aligns with the study's aim to identify significant barriers and contributing factors while maintaining

methodological rigor using established quantitative and statistical techniques.

Ethical Considerations

The present study adhered to established ethical principles in psychological research to ensure the protection, dignity, and well-being of all participants. Ethical considerations were guided by the British Psychological Society (BPS) Code of Human Research Ethics, which emphasizes respect, scientific integrity, social responsibility, and the minimization of harm. All procedures were reviewed and approved by the University Research Ethics Committee prior to data collection, ensuring that the study met institutional and professional ethical standards (BPS, 2021).

Ethical Approval

Ethical approval was obtained from the university researcher ethics committee prior to data collection, ensuring compliance with institutional and professional standards. In line with these principles, informed consent was obtained electronically before participation, with participants confirming that they were aged 18 years or older and that their involvement was voluntary. This aligns with best practice in psychological research, which requires that participants be fully informed about the nature of this study and their right to withdraw at any stage without penalty before submitting their response. Data were securely stored on a password-protected, encrypted university one drive system, accessible only to the researcher and supervisor in accordance with ethical and data protection guidelines (British Psychological Society, 2021). This study was considered to involve minimal risk; however, some questionnaire items assessing psychological well-being (e.g., stress and anxiety) had the potential to cause mild emotional discomfort. Participants were therefore informed that they could skip any questions or withdraw at any time before submission. To further minimize harm, a brief sheet was provided at the end of the survey, including information about university well-being services and external support

organization (see Appendix D), consistent with ethical recommendations for research involving psychological measures.

Strengths and Limitations

A key strength of the ethical design was the initiative-taking inclusion of support resources and the option for participants to withdraw at any stage before submission, which enhanced participant protection and autonomy. This is consistent with ethical guidance emphasizing respect for participants, rights, and ongoing consent psychological research (British Psychological Society, 2021). Additionally, the use of anonymous data collection reduced the risk of privacy breaches and encouraged more honest and valid responses, which is considered good practice in survey-based research.

However, a limitation is that self-report measures involving psychological well-being may still have caused mild emotional discomfort for some participants, even with safeguards in place. Such risks are commonly acknowledged in research involving sensitive constructs and are difficult to eliminate entirely. Furthermore, while debriefing information and support resources were provided, it could not be guaranteed that all participants engaged with or used the available support, which may have limited the effectiveness of harm reduction procedures.

Overall, while the study was ethically robust and aligned well with professional standards such as the British Psychological Society guidelines on respect, autonomy, and nonmaleficence (British Psychological Society, 2021), it could not fully eliminate potential participant risk. This highlights an ongoing challenge in psychological research: balancing the need to collect meaningful data on sensitive issues with the responsibility to minimize emotional harm and ensure participant welfare in practice.

Results

Informed Consent of Participants

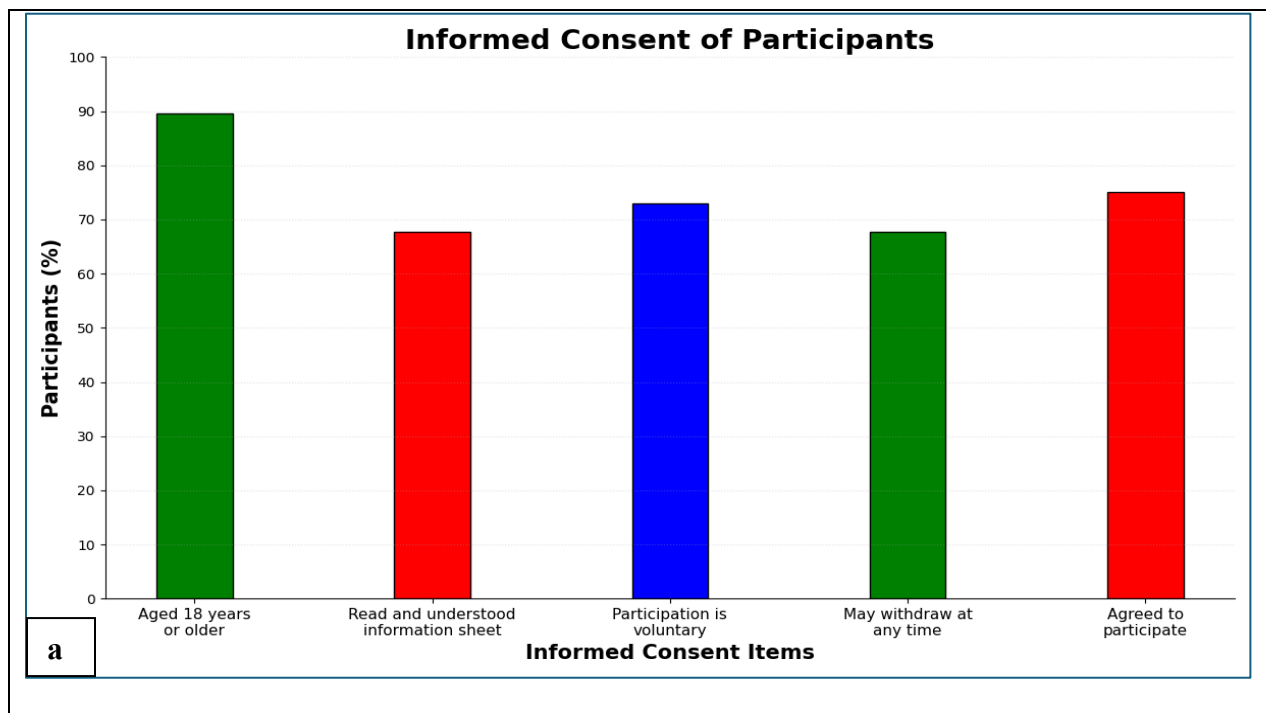
One hundred percent of all 100 participants who completed the survey gave final informed consent for participation in this study. Participants

received the participant information sheet and consent information, detailing the purpose of the study, procedures, confidentiality, voluntary participation, and their right to opt out prior to completing the questionnaire. The last consent item verified that all completed responses were made voluntarily. Additionally, 73% reported that they had volunteered to participate, and 68% understood they could opt out of the study at any time. Overall, 75% of participants agreed to participate in the study. These results show that most of the subjects had been informed of the study information, knew that participation

was voluntary and knew that they could withdraw at any time (Figure 1a).

Previous Experience with Online Learning

Regarding their experience with online learning, the results indicated that 45% of the participants had any experience using online learning, which was the highest number of respondents. A total of 37% reported less than one year of experience, compared with 18% who had experience with online learning for three years or more. As such, the results indicated that many of the respondents had previous experience in online learning, with the maximum being 1- 2 years of experience (Figure 1b).



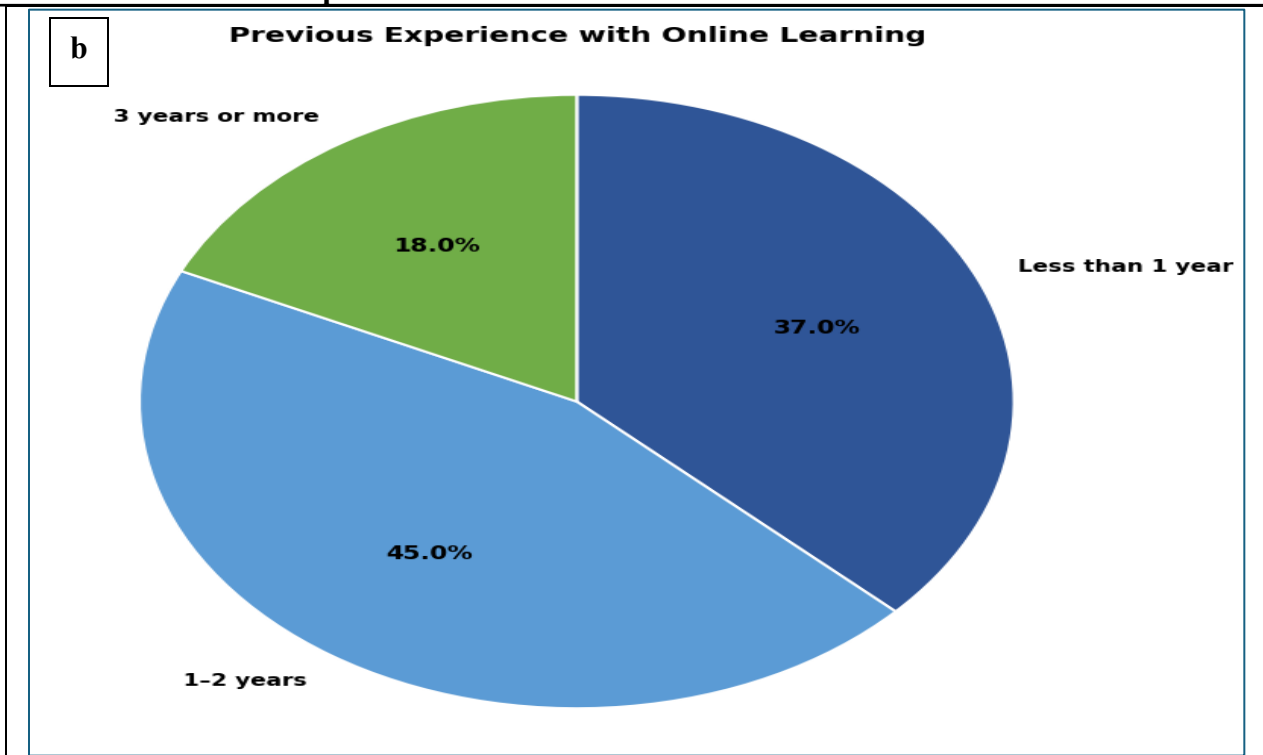


Figure (1a-1b): a) Informed Consent (Optional checklist) b) Previous Experience with Online Learning

Final Consent

All 100 respondents who completed the survey gave final consent. Combined with Table 1, this

indicates that while some participants skipped optional confirmation items, no one actively declined participation after reading information sheet table 1.

Table 1: Final Consent (Mandatory checklist)

Final Consent	(Numbers)	(Percentages)
I agree to participate.	100	100%
I do not agree.	0	0%

Gender Distribution of Participants

The gender proportion of the participants presented in Figure 2a shows that the largest number of participants were male (52%) and females (45%). Three percent did not want to identify as a gender. Overall, the distribution suggests a fairly even case of females and males involved as well as a small number who did not report their gender figure 2a.

Age Distribution of Participants

The age distribution of the participants is shown in Figure 2b. The 18-24 years age group accounted for 50% of the respondents, which was the largest group. This was followed by those aged 25-34 years (38%). The group aged 35 - 44 represented 11%, with the group of 45 - 54 years representing approximately 1% of the sample. No participants were noted in the under 18 years, 55-64 years and over 64 years age groups. Therefore, the study population was mainly young adults (88% of respondents aged 18-34 years) (Figure 2b).

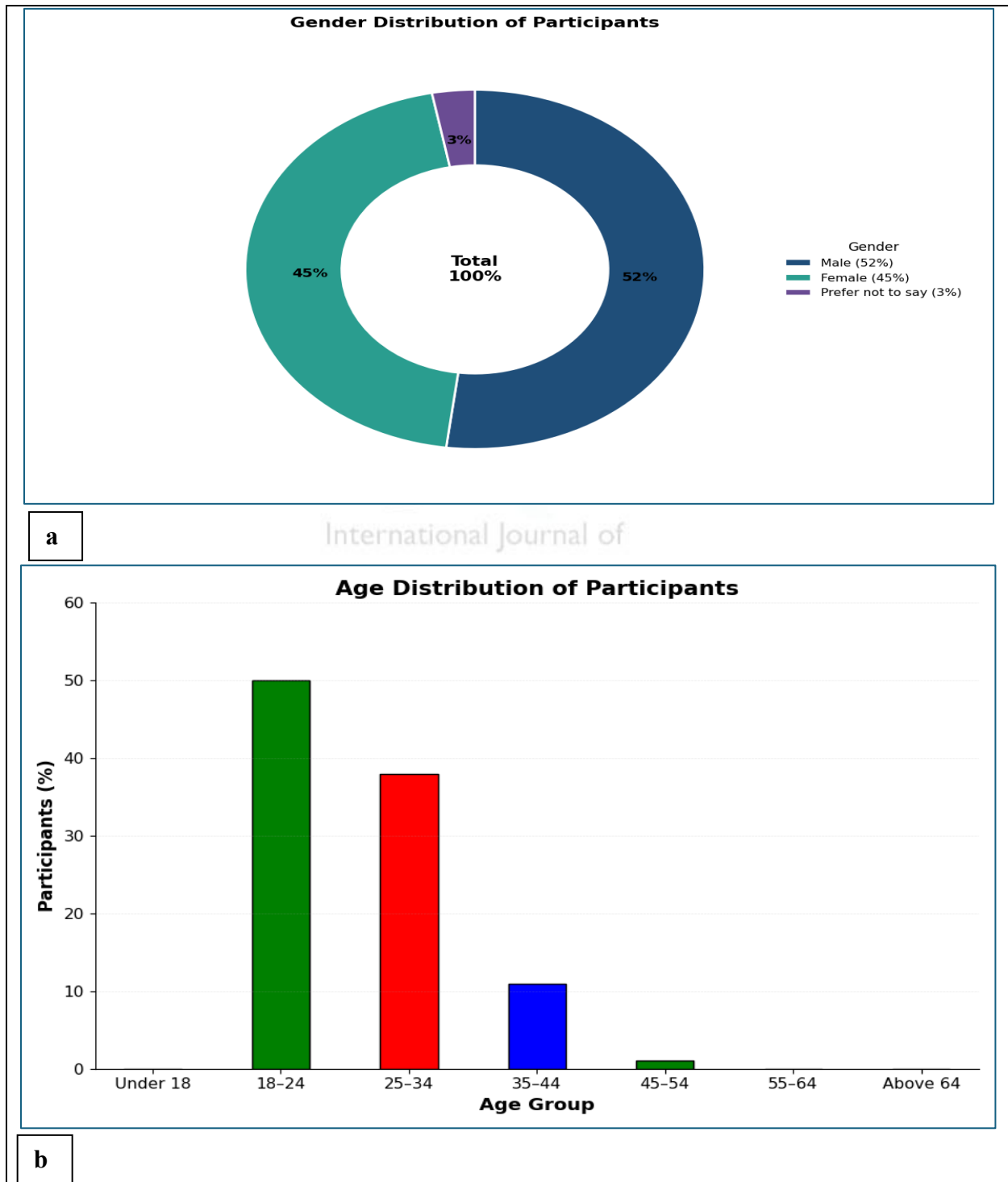


Figure 2a-2b: a) Age Distribution of Participants b) Gender Distribution of Participants

Level of Study

Most participants were bachelor's (48.48%) or master's (33.33%) students. Professionals were (2.02%) and (4%) were doctoral candidates.

The fully online study mode was 29%, and blending learning was the dominant mode (71%). This is important because engagement and communication quality may differ between fully online and blended contexts (Table 2).

Table 2: Level of study

Level of study	(Numbers)	(Percentages)
High school	8	8.08%
Some college	3	3.03%
Trade/vocational/technical	0	0.00%
Associates	1	1.01%
Bachelors	48	48.48%
Masters	33	33.33%
Professional	2	2.02%
Doctorate	4	4.04%

Mode of Study

Most participants were bachelor's (48.48%) or master's (33.33%) students. Professionals were

(2.02%) and (4%) were doctoral candidates (Table 3).

Table 3: Mode of Study

Mode of study	(Numbers)	(Percentages)
Fully Online	29	29.00%
Blended (Combination of online and in-person)	71	71.00%

Previous experience with online learning

Most participants (82%) had less than three years of online learning experience, with the largest group (45%) having 1-2 years. The suggest are

experienced but not expert sample. The (18%) with three or more years may possess qualitatively different Table 4.

Table 4: Previous Experience with Online Learning

Previous Experience with Online Learning	(Numbers)	(Percentages)
Less than 1 year	37	37.00%
1-2 years	45	45.00%
3 years or more	18	18.00%

Academic Engagement

As per Table 5, academic engagement was measured using the Online Student Engagement Scale (Dixon et al., 2015) on a 1-5 scale. Overall engagement was moderate ($M=2.84$, $SD=0.65$, $N=99$). The highest rated item was "I make sure to keep up with weekly coursework" ($M = 3.11$,

$SD=1.05$), and the lowest was "I participated actively in online discussions" ($M= 2.56$, $SD=1.02$). Most items showed means between 2.69 and 2.97, indicating that students rated themselves between "slightly" and "moderately" characteristic of each engagement behavior.

Table 5: Academic Engagement (Online student engagement scale)

Items	Not at all	Slightly	Moderately	Very Characteristics	Very Characteristics	(M)	(SD)
1) I participate actively in online discussions.	16 16.16%	29 29.29%	43 43.43%	5 5.05%	6 6.06%	2.56	1.02
2) I regularly complete assigned readings.	6 6.32%	26 27.37%	39 41.05%	18 18.95%	6 6.32%	2.92	0.99
3) I feel emotionally involved in my online classes.	17 17.89%	27 28.42%	23 24.21%	19 20%	9 9.47%	2.75	1.24
4) I make sure to keep up with weekly coursework.	5 5.32%	23 24.47%	32 34.04%	25 26.6%	9 9.57%	3.11	1.05
5) I put effort into understanding course material.	7 7.37%	28 29.47%	31 32.63%	21 22.11%	8 8.42%	2.95	1.08
6) I contribute ideas during online activities.	11 11.77%	31 32.98%	32 34.04%	16 17.02%	4 4.26%	2.69	1.03
7) I stay engaged even when coursework is challenging.	7 7.37%	33 34.74%	27 28.42%	23 24.21%	5 5.26%	2.85	1.04
8) I interact with other students in meaningful ways.	13 13.68%	23 24.21%	31 32.63%	20 21.05%	8 8.42%	2.86	1.15
9) I review feedback carefully to improve my work.	6 6.32%	29 30.53%	31 32.63%	20 21.05%	9 9.47%	2.97	1.08
10) I feel motivated to succeed in my online course.	11 11.83%	28 30.11%	30 32.26%	17 18.28%	7 7.53%	2.80	1.11
Total						2.84	0.65

Communication Quality

Table 6 shows that communication quality was measured using an adapted version of the Communication Satisfaction Questionnaire on a 1-5 scale. Overall communication quality was moderately high (M=3.44, SD=0.67, N=98). The highest rated item was “feedback from instructors

is timely” (M=3.61, SD=0.86), and the lowest was “I feel comfortable asking questions online” (M=3.40, SD=0.99). Most items showed means between 3.40 and 3.61, indicating that participants leaned towards “agree” regarding communication quality in their online courses.

Table 6: Communication Quality

Items	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	(M)	(SD)	(N)
1) Course expectations are clearly communicated.	13.13%	2.02%	42.42%	41.41%	1.01%	3.15	0.99	99
2) Instructions for assignments are easy to understand.	4.08%	9.18%	29.59%	51.54%	5.51%	3.45	0.89	98
3) Feedback from instructors is timely.	3.06%	6.12%	26.53%	54.55%	9.18%	3.61	0.86	98
4) Feedback from instructors is helpful.	4.08%	7.14%	29.59%	50.00%	8.16%	3.52	0.90	98
5) Communication with lecturers is accessible.	3.06%	9.18%	31.03%	43.48%	9.18%	3.45	0.89	98
6) Peer communication is encouraged in the course.	4.08%	11.22%	31.03%	43.48%	9.18%	3.43	0.95	98
7) I feel comfortable asking questions online.	6.12%	10.23%	29.59%	45.45%	8.16%	3.40	0.99	98
8) Online communication tools (e.g., forums, emails) are effective.	5.71%	7.14%	29.59%	43.48%	9.18%	3.55	1.00	98
9) I feel informed about course updates and changes.	5.51%	5.51%	34.78%	51.52%	3.69%	3.43	0.85	98
10) Communication in this course supports my learning.	6.12%	6.12%	30.81%	36.36%	7.14%	3.46	0.94	98

Total						3.44	0.67	98
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Digital Competence

Table 7 shows that digital competence was measured using an adopted digital skills scale (van Deursen et al., 2016) on a 1-5 scale. Overall digital competence was moderate to high ($M=3.51$, $SD=0.62$, $N=97$). The highest rated item was “I can use digital tools effectively”

($M=3.80$, $SD=0.84$), and the lowest was “I feel confident navigating online learning platforms” ($M=3.20$, $SD=0.90$). Most items showed means between 3.31 and 3.80, indicating that participants leaned towards “agree” regarding their digital skills for online learning.

Table 7: Digital Competence

Items	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	(M)	(SD)	(N)
1) I feel confident navigating online learning platforms.	77.07%	99.09%	42.42%	39.39% %M 3 9%	22.02%	3.20	0.90	99
2) I can upload assignments without difficulty.	22.06%	13.4%	20.62%	53.64%	99.28%	3.56	0.91	97
3) I can troubleshoot minor technical issues independently.	22.08%	12.5%	32.33%	44.83% %8 3 %	66.25%	3.42	0.87	96
4) I can participate confidently in virtual discussions.	66.19%	55.15%	30.93%	47.48%	99.28%	3.49	0.96	97
5) I can use digital tools (e.g., Word, PowerPoint, online forums) effectively.	22.06%	33.09%	24.74%	51.52% %%	17.53%	3.80	0.84	97
6) I can evaluate the reliability of	33.09%	99.28%	27.84%	44.36% %%	14.43%	3.59	0.95	97

online academic sources.								
7) I feel comfortable using new digital technologies for learning.	22.06%	44.12%	29.9%	44.36% 36%	18.56%	3.74	0.88	97
8) I can manage multiple online learning tools simultaneously.	55.15%	1212.37%	26.8%	40.24% 4%	14.43%	3.47	1.05	97
9) I rarely experience technical difficulties that disrupt my learning.	88.25%	1010.31%	35.68%	32.99% 32.99%	12.37%	3.31	1.08	97
10) I feel digitally competent in my studies.	66.12%	66.12%	333.67% .67%	4040.82% .82%	13.27%	3.49	1.01	98
Total						3.51	0.62	97

Psychological Well-being

Table 8 shows that psychological distress was measured using the 21-item DASS-21 (Lovibond & Lovibond, 1995) on a 0–3 scale. Overall distress was moderate ($M = 2.35$, $SD = 0.53$, $N = 97$), indicating that, on average, symptoms applied “to some degree”. The highest-rated item

was “I was using a lot of nervous energy” ($M = 2.54$, $SD = 0.99$), and the lowest was “I was aware of dryness of my mouth” ($M = 2.19$, $SD = 0.83$). Most items showed means between 2.19 and 2.54, reflecting mild to moderate levels of anxiety, depression, and stress symptoms across the sample.

Table 8: Psychological Well-Being Scale (Depression, Anxiety Stress Scale)

Items	Did not apply to me at all	Applied to me some degree	Apply to me considerable degree	Applied to me very much	(M)	(SD)	(N)
1) I found it hard to wind down.	15.15%	47.47%	35.35%	22.02%	2.24	0.73	99
2) I was aware of dryness of my mouth.	22.68%	40.21%	32.99%	44.12%	2.19	0.83	97

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3) I could not seem to experience any positive feeling at all.	24.74%	32.99%	34.02%	88.25%	2.26	0.93	97
4) I experienced breathing difficulty.	34.02%	21.65%	28.87%	15.46%	2.26	1.09	97
5) I found it difficult to work up the initiative to do things.	15.62%	35.42%	40.62%	88.33%	2.42	0.85	96
6) I tended to overreact to situations.	25.77%	36.08%	23.71%	14.43%	2.27	1.01	97
7) I experienced trembling.	26.8%	31.96%	31.96%	99.28%	2.24	0.95	97
8) I was using a lot of nervous energy.	15.46%	36.08%	27.84%	20.62%	2.54	0.99	97
9) I was worried about situations in which I might panic.	18.56%	31.93%	36.08%	14.43%	2.46	0.96	97
10) I had nothing to look forward to.	21.65%	25.77%	31.96%	20.62%	2.52	1.05	97
11) I found myself getting agitated.	20.62%	35.05%	28.87%	15.46%	2.39	0.98	97
12) I found it difficult to relax.	16.49%	35.05%	29.9%	18.56%	2.51	0.98	97
13) I felt downhearted and blue.	19.20%	37.89%	23.21%	17.89%	2.40	1.00	95
14) I was intolerant of anything that kept me from getting on with what I was doing.	16.49%	38.14%	26.8%	18.56%	2.47	0.98	97
15) I was close to panic.	21.65%	39.18%	25.77%	13.4%	2.31	0.96	97
16) I was unable to become enthusiastic about anything.	20.62%	34.02%	29.9%	15.46%	2.40	0.99	97
17) I was not worth much as a person.	25.77%	27.84%	34.02%	12.37%	2.33	1.00	97
18) I was touchy.	23.71%	38.14%	18.56%	19.59%	2.34	1.05	97
19) I was aware of	21.88%	40.62%	25.04%	11.46%	2.27	0.93	96

the action of my heart without physical exertion.							
20) I felt scared without any good reason.	22.68%	36.08%	32.99%	88.25%	2.27	0.91	97
21) Life was meaningless.	27.84%	30.93%	28.87%	12.37%	2.26	1.00	97
Total		4747.47%			2.35	0.53	97

Field of Study

The distribution of the participants by field of study is shown in Figure 3a, with the largest group of students (44, 43.6%), followed by students at full-time employment (23, 22.8%) and those at part-time employment (15, 14.9%). Ten (9.9%) of the participants were self-employed, and six (5.9%) were unemployed. There was 1 participant each (1.0%) in each of the following categories: homemakers, military personnel, and retired participants. This was then raised by 66.3% by students, full-time employees, 81.2% by part-time employees, and 91.1% by self-employed participants to reach a cumulative percentage of 43.6% to 91.1%. Therefore, most of the participants were students or held a job of work on a full-time or part-time basis (Figure 3a).

General descriptive statistics for the key variables

Academic engagement was 2.84 ± 0.65 , and communication quality was 3.44 ± 0.67 . The overall descriptive statistics are shown in Figure 3b. The variable that recorded the highest mean score among the 1–5 scale variables was digital competence, with a mean score of 3.51 ± 0.62 . Psychological well-being (distress) was measured with a mean of 2.35 ± 0.53 on the 0–3 scale, as opposed to psychological well-being (comfort), which was measured with a mean of 0.41 ± 0.77 on the 0–3 scale. Overall, the mean scores of digital competence and communication quality were relatively high, while academic engagement was relatively low. The moderate range of responses within the participants on the measured variables was suggested by relatively small standard deviations (Figure 3b).

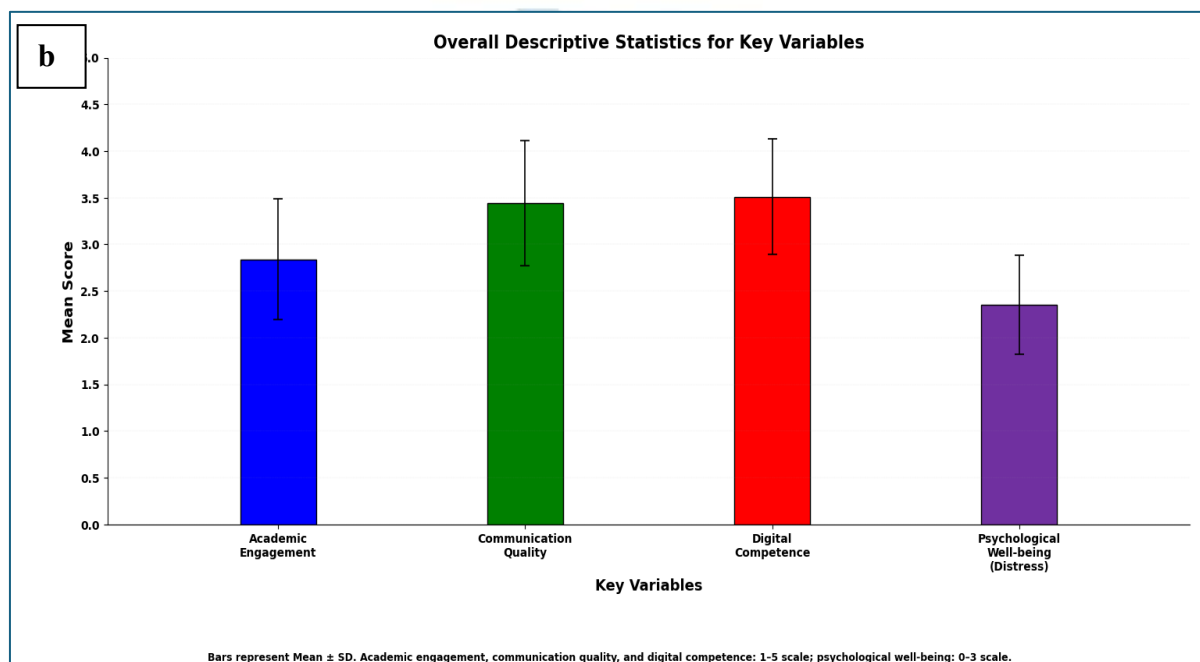
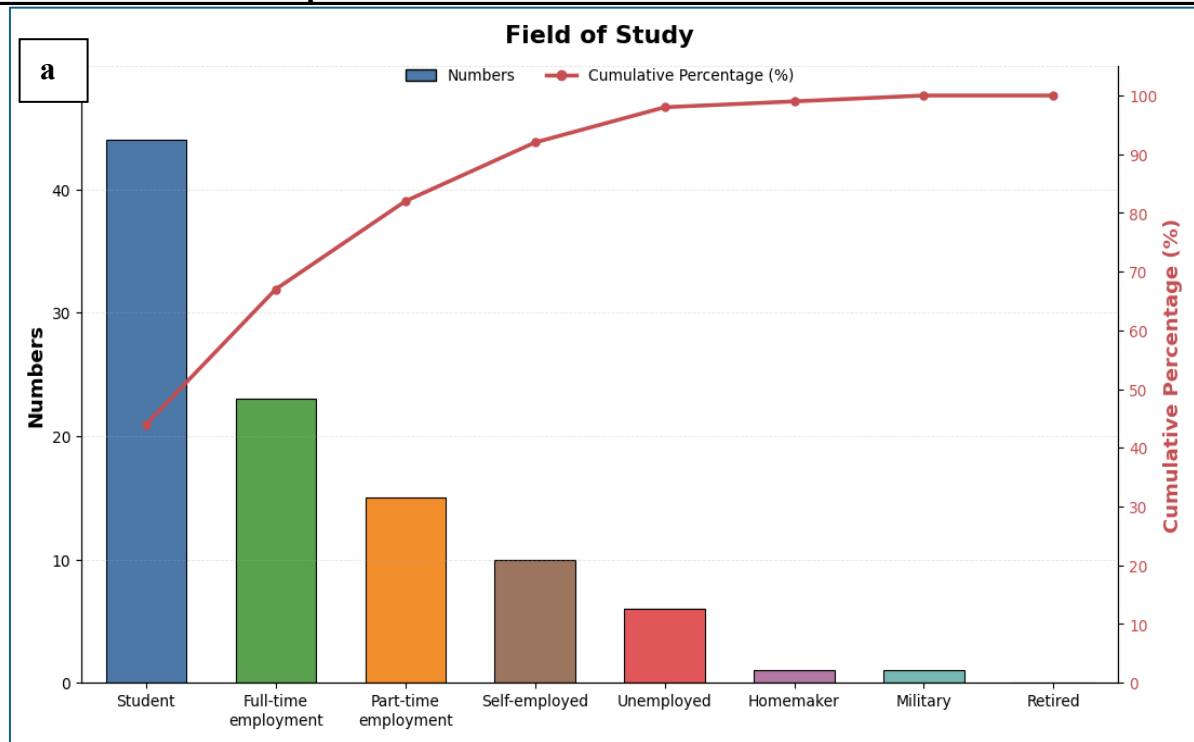


Figure (3a-3b): Overall Descriptive Statics for Key Variables b) Field of Study

Correlation Analysis (Pearson)

A Pearson correlation was conducted to examine relationships among academic engagement, communication quality, digital competence, and psychological well-being. Academic engagement was positively correlated with communication quality ($r = .52, p < .01$) and digital competence ($r = .47, p < .01$) but negatively correlated with

psychological distress ($r = -.38, p < .01$). Communication quality and digital competence were also positively related ($r = .44, p < .01$). Psychological well-being showed weak negative correlations with communication quality ($r = -.29, p < .05$) and digital competence ($r = -.31, p < .05$) (Table 9).

Table 9: Pearson Correlation Matrix

Variables	1	2	3	4
1. Academic Engagement				
2. Communication quality	.52**			
3. Digital competence	.47**	.44**	-.22**	
4. Psychological well-being	-.38**	-.29**	-.31*	

Note: “* $p < .05$, ** $p < .01$, $N=96-99$ ”.

Multiple Linear Regression Analysis

To predict academic engagement from communication quality, digital competency, and psychological well-being, a multiple linear regression analysis was conducted. With $F(3, 96) = 18.34, p < .001$, the overall model was statistically significant and accounted for 36% of

the variance in academic engagement ($R^2 = .36$; adjusted $R^2 = .24$). The greatest unique predictor was communication quality ($\beta = .38, p < .001$), followed by digital competence ($\beta = .26, p = .008$). Another significant negative predictor was psychological well-being ($\beta = -.22, p = .012$). Table 10 displays the regression coefficients.

Table 10: Multiple Regression Analysis

Predictor	B	SE	B	*t*	*p*
(Intercept)	0.87	0.31		2.81	.006
Communication quality	0.37	0.10	.38	3.70	<.001
Digital competence	0.27	0.10	.26	2.70	.008
Psychological well-being	-0.27	0.11	-.22	-2.55	.012

Note: “ $N=100, R^2=.36$, adjusted $R^2=.24$, Dependent variable: Academic engagement (scale 1-5)”.

Discussion

Overview of the Main Findings

The present study examined academic engagement in online higher education in relation to communication quality, digital competence, and psychological well-being. The findings indicate that although participants

reported relatively favourable levels of communication quality and digital competence, their overall academic engagement was comparatively lower. Academic engagement had a mean score of 2.84 ± 0.65 , whereas communication quality was 3.44 ± 0.67 and digital competence was 3.51 ± 0.62 . Psychological

distress had a mean score of 2.35 ± 0.53 , suggesting that psychological factors remained an important consideration in the online learning experience.

The correlation analysis further demonstrated that academic engagement was positively associated with communication quality ($r = .52$, $p < .01$) and digital competence ($r = .47$, $p < .01$), while psychological distress was negatively associated with engagement ($r = -.38$, $p < .01$). The multiple regression analysis showed that communication quality was the strongest predictor of academic engagement ($\beta = .38$, $p < .001$), followed by digital competence ($\beta = .26$, $p = .008$), whereas psychological distress was a significant negative predictor ($\beta = -.22$, $p = .012$). Collectively, the predictors explained approximately one-third of the variance in academic engagement.

These findings support the view that online academic engagement is a multidimensional phenomenon influenced by relational, technological, and psychological conditions rather than by a single factor. This interpretation is consistent with broader conceptualizations of student engagement that emphasize behavioural, emotional, and cognitive dimensions and the interaction between individual and educational-context factors (Fredricks et al., 2004; Kahu, 2013; Kahu & Nelson, 2018).

Previous Experience With Online Learning

The demographic findings showed that 45% of participants had 1–2 years of previous online learning experience, 37% had less than one year, and 18% had three years or more. Thus, most participants had some exposure to online learning, but the majority had not reached the longest experience category. The study therefore appears to represent a population with moderate exposure to online education rather than a predominantly expert online-learning population. This finding is important because familiarity with online learning may influence students' ability to navigate platforms, communicate with instructors, manage coursework, and participate in online activities. Previous research suggests

that online learning requires students to develop both technological and self-regulatory competencies. Broadbent and Poon (2015), for example, highlighted the importance of self-regulated learning strategies for academic performance in online higher education. Similarly, Schunk and Zimmerman (2003) and Zimmerman and Schunk (2004) emphasized that successful learners actively regulate their cognition, motivation, and behaviour in relation to learning goals.

The present findings also suggest that experience alone may not be sufficient to produce high engagement. Despite the relatively high digital competence score, academic engagement remained moderate. This may indicate that technical familiarity does not automatically translate into active participation, emotional involvement, or sustained motivation. Rather, digital competence may provide the necessary conditions for participation, while communication quality and psychological well-being determine whether students are able and willing to engage consistently. This interpretation is consistent with research showing that technology-related factors interact with pedagogical and psychosocial factors in shaping engagement (Richardson & Milovidov, 2019; Culcasi et al., 2025).

Academic Engagement

Overall academic engagement was moderate ($M = 2.84$, $SD = 0.65$). The highest-rated engagement item was “I make sure to keep up with weekly coursework” ($M = 3.11$, $SD = 1.05$), whereas the lowest-rated item was “I participate actively in online discussions” ($M = 2.56$, $SD = 1.02$).

This pattern suggests that participants were more likely to engage in individual and task-oriented academic behaviours than in interactive forms of engagement. Completing coursework and maintaining academic responsibilities may be easier for students because these behaviours can be performed independently, whereas online discussions require communication, confidence, social presence, and interaction with peers and instructors.

This finding is consistent with the multidimensional conceptualization of engagement proposed by Fredricks et al. (2004), which distinguishes behavioural, emotional, and cognitive engagement. In an online context, students may complete assigned work while simultaneously demonstrating lower levels of social or emotional engagement. Dixson (2015) similarly emphasized that online engagement encompasses multiple behaviours and that meaningful engagement is not limited to simply accessing course materials.

The relatively low score for active participation in online discussions is particularly noteworthy. Online discussion is an important component of social interaction and knowledge construction, but students may be reluctant to participate when they feel uncertain, disconnected, or insufficiently supported. Moore's (1989) framework identifies learner-to-learner and learner-to-instructor interaction as important dimensions of distance education. Likewise, the Community of Inquiry framework emphasizes the importance of social, cognitive, and teaching presence in creating meaningful online learning experiences (Zhao & Sullivan, 2017).

Communication Quality and Academic Engagement

Communication quality was relatively high in the present study ($M = 3.44$, $SD = 0.67$). The highest-rated communication item concerned the timeliness of instructor feedback ($M = 3.61$, $SD = 0.86$), while the lowest-rated item concerned students' comfort in asking questions online ($M = 3.40$, $SD = 0.99$).

The relatively favourable perception of communication quality is encouraging because effective communication can reduce uncertainty, clarify academic expectations, and help students understand how to improve their performance. The importance of communication is further demonstrated by the significant positive relationship between communication quality and academic engagement ($r = .52$, $p < .01$). Among all the variables examined, communication

quality had the strongest relationship with engagement.

This finding is consistent with Martin and Bolliger (2023), who reported that students considered learner-to-instructor engagement strategies particularly important in online learning. Their findings emphasized the value of instructor communication, regular announcements, feedback, and structured learning activities. The present finding also agrees with Bolliger and Martin (2018), who demonstrated that instructors and students recognize the importance of strategies designed to promote online engagement.

The regression results provide stronger evidence for the importance of communication. Communication quality was the strongest unique predictor of academic engagement ($\beta = .38$, $p < .001$). This suggests that communication may have a particularly important role even after considering digital competence and psychological distress simultaneously (Bucci et al., 2019).

The result can also be interpreted using the educational interface framework of Li & Xue (2023), which proposes that engagement emerges through the interaction between student characteristics and educational conditions. High-quality communication may create a supportive educational interface in which students receive timely feedback, understand expectations, and feel connected to their instructors. Similarly, (Stone & Springer, 2019; Rhim & Han, 2020) emphasized teacher presence, learning activity design, and appropriate online interaction as important components of effective university teaching.

However, the finding that students were least comfortable asking questions online suggests that communication quality may still have room for improvement. Institutions may therefore need to move beyond simply providing information and focus on creating psychologically safe communication environments where students can ask questions without fear of embarrassment or negative evaluation.

Digital competence and academic engagement

Digital competence was the highest-scoring construct among the principal 1–5 scale variables ($M = 3.51$, $SD = 0.62$). Participants reported the highest level of confidence in using digital tools effectively ($M = 3.80$, $SD = 0.84$), whereas confidence in navigating online learning platforms was comparatively lower ($M = 3.20$, $SD = 0.90$).

The positive correlation between digital competence and academic engagement ($r = .47$, $p < .01$) indicates that students with greater digital competence tended to report greater engagement. Furthermore, digital competence remained a significant predictor of engagement after communication quality and psychological distress were considered ($\beta = .26$, $p = .008$).

These findings are consistent with the broader literature on digital skills. Van Laar et al. (2017) conceptualized digital skills as extending beyond basic technical operation to include communication, collaboration, information management, critical thinking, problem solving, and self-direction. Pöntinen and Rätty-Záborszky (2020) similarly emphasized that digital competence incorporates multiple dimensions rather than simply the ability to operate technological devices.

The findings are also supported by Zhao et al. (2025), who found that digital competence could contribute positively to students' engagement in online learning and could help reduce cognitive burdens associated with online study. Their findings are particularly relevant because they demonstrate that digital competence may influence engagement through the student's ability to manage the demands of online learning. The current results therefore suggest that universities should not assume that students automatically possess sufficient digital competence. Although the participants generally reported moderate-to-high competence, their lower confidence in navigating online platforms indicates that platform-specific training may still be beneficial. This is also supported by evidence from large-scale international research showing that deficiencies in computer skills can interfere

with students' experiences of online education (Obadić (2021).

Psychological Well-Being and Academic Engagement

Psychological distress represented an important negative factor in the present study. The overall distress score was $M = 2.35$ ($SD = 0.53$), and the findings indicated mild-to-moderate symptoms across several psychological domains.

Importantly, psychological distress was negatively correlated with academic engagement ($r = -.38$, $p < .01$). It also remained a significant negative predictor in the regression model ($\beta = -.22$, $p = .012$). This suggests that students experiencing greater psychological distress may find it more difficult to maintain active engagement with online academic activities.

This finding is consistent with research demonstrating the psychological challenges associated with online and emergency remote learning. (Sahay et al., 2024) found that many college students experienced increased stress and anxiety during the COVID-19 pandemic, with difficulties concentrating and concerns about academic performance among commonly reported problems. Similarly, Luo & Mohammed (2023) identified substantial psychological pressure among college students during the COVID-19 outbreak. (Li et al., 2020) also reported changes in psychological distress, depression, anxiety, and affect among college students during COVID-19 confinement.

The negative association between psychological distress and engagement can also be understood through self-determination theory. Standage et al., (2025) proposed that autonomy, competence, and relatedness are fundamental psychological needs that support motivation and well-being. In online education, psychological distress may interfere with these needs by reducing students' perceived competence, motivation, concentration, and sense of connection. Thus, even when technological resources and communication are available, psychological difficulties may prevent students from fully engaging with learning.

The findings should nevertheless be interpreted cautiously because the present study used a cross-sectional design. The negative relationship does not demonstrate that psychological distress causes low academic engagement. It is equally possible that disengagement, academic pressure, or poor educational experiences contribute to psychological distress. Longitudinal research is needed to establish the temporal direction of these relationships.

Integrated Contribution of Communication, Digital Competence, and Psychological Well-Being

One of the most important findings of this study is that communication quality, digital competence, and psychological distress were simultaneously significant predictors of academic engagement. The regression model was statistically significant, $F(3, 96) = 18.34, p < .001$, indicating that the predictors collectively contributed substantially to explaining variation in academic engagement.

The relative size of the standardized regression coefficients indicates that communication quality made the largest unique contribution, followed by digital competence and psychological distress. This supports an integrated understanding of online engagement. Academic engagement should not be viewed exclusively as a student characteristic; rather, it appears to emerge from the interaction of educational support, technological competence, and psychological functioning.

This interpretation is consistent with Kahu's (2021) engagement framework, which distinguishes engagement itself from the factors that influence it. Kahu and Nelson (2018) subsequently emphasized the educational interface through which student and institutional factors interact. The present findings provide empirical support for this broader perspective because all three predictor domains remained relevant when considered simultaneously.

The findings are also consistent with Bond et al. (2020), whose systematic evidence map demonstrated the complex relationship between

educational technology and behavioural, affective, and cognitive forms of engagement in higher education. Their review also identified the need for stronger theoretical and methodological integration in research on technology and engagement.

The results therefore suggest that interventions targeting only one dimension may have limited effects. Providing students with better technology without improving communication may not be sufficient. Similarly, improving instructor communication may not fully address disengagement among students experiencing substantial psychological distress. A comprehensive institutional approach is therefore more appropriate.

Communication as the Strongest Predictor

The strongest unique predictor in the present study was communication quality ($\beta = .38$). This result is particularly important because communication was not merely associated with engagement; it remained the strongest predictor after digital competence and psychological distress were statistically controlled.

This finding emphasizes the central role of instructor presence in online education. Online learners may have fewer opportunities for spontaneous interaction than students in face-to-face environments, making planned communication especially important. Timely feedback, clear assignment instructions, accessible lecturers, regular course updates, and effective communication tools can provide structure and reduce uncertainty.

Martin & Bolliger (2018) found that learner-to-instructor engagement strategies were particularly valued by online students. Similarly, Rapanta et al. (2020) emphasized the importance of teacher presence and carefully designed learning activities in online university teaching. Keržič et al. (2021), using data from more than 10,000 students across ten countries, also reported that teacher activity and service quality were important components of perceived e-learning quality.

Consequently, universities should prioritize instructor responsiveness, clear communication,

timely feedback, and opportunities for meaningful interaction when designing online learning environments.

Implications for Online Higher Education

The findings have several practical implications. First, institutions should provide structured communication systems that ensure that students receive timely and consistent feedback. Second, online courses should include opportunities for learner-to-instructor and learner-to-learner interaction rather than relying exclusively on independent study. Third, digital competence training should be embedded within online programmes, particularly for students who have limited experience with learning platforms.

Fourth, psychological support should be considered an integral part of online education rather than a separate service. Students experiencing stress, anxiety, or other psychological difficulties may require accessible counselling, academic support, workload management, and opportunities for social connection. Evidence from large international surveys indicates that online learning during periods of disruption can be accompanied by concerns regarding workload, mental health, social interaction, and academic performance (Aristovnik et al., 2020).

Finally, course design should be responsive to students' actual learning needs. (Nilson & Goodson, 2021) demonstrated that online learning outcomes depend substantially on how online instruction is designed and implemented rather than on the technology itself. Similarly, (Barbour et al., 2020) distinguished planned online learning from emergency remote teaching, highlighting the importance of purposeful instructional design.

Strengths and Limitations

A major strength of the present study is the simultaneous examination of communication quality, digital competence, psychological distress, and academic engagement. This integrated approach provides a more comprehensive understanding than examining these factors

independently. The use of established instruments, including the Online Student Engagement Scale and DASS-21, also strengthens the measurement framework. OSE has previously been validated for assessing online student engagement (Öztekin, 2025), while the DASS-21 has demonstrated acceptable psychometric properties in nonclinical populations (Gillies & Dozois, 2021).

Another strength is that the study included participants with different levels of previous online learning experience. The inclusion of both fully online and blended learners also provides useful contextual information because the educational experience may differ across these formats. In the present sample, 29% studied fully online, and 71% participated in blended learning.

However, several limitations should be considered. First, the study appears to rely on self-report questionnaires, which may be affected by recall bias, social desirability, and common-method variance. Second, the cross-sectional nature of the study prevents causal conclusions. Third, the sample size used for the inferential analyses was approximately 96–100 participants, which may limit generalizability. Fourth, the use of online recruitment may have resulted in selection bias because students who were already comfortable using digital technologies may have been more likely to participate.

The study also contains a small reporting inconsistency concerning the regression model. The results narrative states that the model accounted for 34% of variance with an adjusted R^2 of .34, whereas the table note reports $R^2 = .36$ and adjusted $R^2 = .24$. This discrepancy should be checked against the original statistical output before the final thesis or manuscript is submitted. Resolving this issue is important for accurate reporting of the model's explanatory power.

There is also an apparent distinction between optional consent confirmations and final mandatory consent. The results state that some participants did not complete optional consent items, while all 100 respondents provided final mandatory consent. Therefore, the discussion

should interpret the optional consent-item percentages as response patterns rather than as evidence that only 75% of participants ultimately consented to participate.

Conclusion

The findings demonstrate that academic engagement in online higher education is influenced by a combination of relational, technological, and psychological factors. Although participants reported relatively favourable communication quality and digital competence, academic engagement remained moderate, particularly for active participation in online discussions. Communication quality demonstrated the strongest positive association and predictive contribution, followed by digital competence, while psychological distress was negatively associated with engagement. The findings therefore support an integrated approach to improving online higher education. Institutions should strengthen instructor-student communication, provide opportunities for meaningful interaction, develop students' digital competencies, and ensure accessible psychological support. Such measures may help create online learning environments in which students are not only able to access educational content but also motivated, supported, psychologically prepared, and technically equipped to participate actively in learning.

Declarations

Availability of data and materials

Data are provided within the manuscript or supplementary information files.

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