

THE MEDIATING EFFECT OF E-LEARNING ON THE RELATIONSHIP BETWEEN STUDENT RESOURCES AND STUDY ENGAGEMENT

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ABSTRACT: This study investigates the relationship between Student Resources (Psycap), Study Engagement, and E-Learning Experience among college students, focusing on the mediating role of E-Learning Experience. Using the Psychological Capital Questionnaire (PCQ) and the Utrecht Work Engagement Scale (UWES-9S), the research assessed students' psychological resources, engagement levels, and their experience of e-learning systems. Results indicate a grand mean score of 3.52 on psychological capital, reflecting a generally positive psychological state among students. The UWES-9S results reveal a high level of study engagement, with a grand mean of 5.34, suggesting students experience consistent energy, dedication, and absorption in their studies. Moreover, students expressed positive perceptions towards their e-learning experience, demonstrated by a grand mean score of 3.87, though they reported mixed feelings on instructional quality and value. A mediation analysis showed that students' experience toward e-learning significantly mediate the relationship between psychological capital and study engagement ($p = 0.0012$), highlighting e-learning as an influential factor in fostering academic engagement.

The findings suggest that while psychological resources are important, their impact on study engagement is significantly influenced by students' e-learning experience. This highlights the need for educational institutions to not only focus on enhancing students' psychological capital but also to improve their e-learning experiences through supportive and engaging online environments. By addressing both psychological and attitudinal factors, it is possible to create a more effective and engaging learning environment for students, particularly in the context of e-learning.

INTRODUCTION

The school learning environment has always been a space where teachers and students engage in face-to-face instruction, fostering direct interaction and collaboration. However, the experience of the COVID-19 pandemic has permanently transformed educational practices, leading to the widespread adoption of online and hybrid learning models. While these modes of learning were essential during the pandemic to maintain continuity, they have now become an integral part of the educational landscape, even as the world transitions to a post-COVID setting. Online learning continues to utilize various technologies and digital tools, providing flexibility and accessibility that complement traditional methods of education. This paradigm shift could also generate changes in students' perception of the methods of teaching and learning, which might be different from the result of the previous studies before the pandemic [1]. It is through this paper, that the researchers tried to capture the existence of such changes.

The educational system in the Philippines continues to evolve, with instructors facing the challenge of integrating online learning with in-person classes. This hybrid approach demands new strategies to engage students effectively, especially those who may have become accustomed to the flexibility of online learning. The pandemic has also reshaped students' perceptions of teaching and learning, highlighting the need for educators to reconsider how to best support student engagement and success. Studies conducted during the pandemic, such as those by [2] and [3], identified challenges like reduced motivation, technical difficulties, and feelings of isolation. These issues remain relevant in the post-pandemic context, where maintaining student engagement across different learning environments is critical.

Research shows that student engagement is closely linked to academic performance and overall student success [4]. However, the data supporting this relationship was largely gathered before the pandemic, necessitating a fresh

evaluation in the current, post-COVID educational environment. Understanding how students engage with learning in this new context is essential for universities aiming to deliver quality education and provide adequate support systems. This study sought to evaluate the ongoing impact of e-learning on the relationship between student resources (Psycap) and study engagement in the post-pandemic setting. The insights gained will guide the development of intervention and support programs tailored to enhance student engagement and success in this evolving educational landscape.

General Objective:

To determine the mediating effect of e-learning experience on the relationship between Student Resources and Study Engagement.

Specific Objective:

1. To evaluate students' resources and student engagement.
2. To examine the perception and attitude of students on e-learning.
3. To determine the relationship between study resources and study engagement.
4. To evaluate the mediating effect of e-learning on the relationship between Student Resources and Study Engagement.
5. To develop intervention and support programs tailored to enhance student engagement and success while on e-learning.

Review of Related Literature

The advent of information technology has paved the way for numerous opportunities worldwide, with its ease of access becoming more common than ever. Its presence is immense and evident, and its role in education is indisputable. E-learning in education serves to deliver, support, and enhance learning and teaching [5]. It is used to enhance teaching quality as well as improve accessibility and time flexibility among students. The adoption of the e-learning modality has been growing for some time already

but with the emergence of COVID-19 and bringing about the declaration of a global health crisis, the distinctive rise of e-learning in education changed drastically.

With the closure of educational institutions, online learning gained momentum as the primary mode of delivering lessons. This sparked digital transformation as it challenges the schools' response effectiveness and preparedness concerning the crisis. Despite school efforts to adopt relevant technologies, prepare learning and staff resources, set systems and infrastructure as well as establish necessary protocols, and adjust curricula, the transition was still rough for others, particularly in developing countries like the Philippines [6].

The abrupt shift to a new learning space has faced several challenges both for the teachers and the learners alike [7; 6]. Among the facets of education affected by the pandemic, one of the tremendously overlooked is the specific learning experience of the students during the pandemic.

Resources to Engagement

Personal resources such as psychological capital can also affect study engagement among students and vice versa ([8]; [9]; [10]). Its effect on academic outcome has generated an increasing amount of research with study engagement as a crucial predictor of academic performance [11].

Study engagement is defined as the extent to which vigor, absorption, and dedication are experienced by the student when participating in activities [12]. Vigor refers to high levels of mental energy upon studying. On the other hand, dedication talks to a sense of challenge and inspiration while absorption in one's immersion in their activities [13]. Other student resources like autonomy and competence have also been found as facilitators of study engagement in the academic setting [14]. The gain spiral of psychological resources and engagement shows their mutual relationship with each other with studies also supporting the positive relationship between academic resources and student engagement which therefore positively impacts their academic performance as well.

E-learning to Engagement

In the study conducted by [15], results showed that logistic component malfunctions of technology in online learning can hinder student engagement. Several other studies also showed that technology can affect student engagement ([16]; [15][17]). Engagement in the generic term refers to students' study patterns, how they use their time, resources, relationships, and communication with their tutors, peers, and organization ([18]; [19]). From a psychological perspective, it pertains to individual characteristics such as motivation, self-efficacy, and expectation while its behavioral perspective refers to time and effort devoted to educationally purposeful activities [19]. During the pandemic, students using e-learning experienced problems with their study habits, the situation at home, and interaction with educators thus leading them to have poor academic performance and experience psychological stress [5]. In a study by Grunwal and Massay (2006), it was recommended that educators should learn to understand the learner's motivation, needs, and past experiences to ensure engagement during the online learning process.

METHODOLOGY

Research Design

A mediation analysis was conducted to examine whether e-learning experiences mediate the relationship between different student resources and study engagement. Mediation analysis investigates whether the mediator explains the relationship between an independent variable and a dependent variable [20]. In this study, the hypothesis posits that e-learning experiences play an intermediary role in linking student resources to study engagement. Specifically, students with higher levels of psychological capital or other resources may exhibit higher study engagement, partly due to their positive experiences and attitudes toward e-learning. This analysis allows for insight into how e-learning experiences contribute to study engagement, by acting as a bridge between available resources and academic engagement.

Research Sampling and Respondents

The participants of this study were students enrolled at North Eastern Mindanao State University – Cantilan Campus who attended asynchronous classes during the 2022–2023 school years.

Table 1. Demographic Profile

Age	Frequency	Percentage
18	24	10.26
19	66	28.21
20	40	17.09
21	34	14.53
22	20	8.55
23	18	7.69
24	17	7.26
25	8	3.42
27	3	1.28
29	2	0.85
39	2	0.85
TOTAL	234	100
Gender	Frequency	%
Female	163	69.66
Male	69	29.49
Prefer not to say	2	0.85
TOTAL	234	100

The study sample comprised 234 respondents, reflecting a diverse age ranging from 18-39 yrs. old. The largest age group was 19 years old, representing 28.21% of the sample, followed by those aged 20 (17.09%) and 21 (14.53%). In terms of gender distribution, the data shows a higher proportion of female participants, making up 69.66% of the sample, with males accounting for 29.49%. A small fraction of respondents (0.85%) opted not to disclose their gender.

Data Gathering Procedure

The participants answered either a packet of questionnaires or Google Forms during their available time in a place of their choice where they felt comfortable. This

method of administration was utilized to avoid bias from respondents who could access the form online, which might have affected the study results.

The purpose of the study was explained, and instructions were given on how to complete the questionnaire. The researchers informed the participants of their anonymity and the full confidentiality of their responses, and then obtained their informed consent. Sufficient time was provided, and respondents were encouraged to ask questions if they needed clarifications.

Research Instruments

The participants responded to a packet of questionnaires consisting of:

Demographic Information

A self-report questionnaire was used to collect information relating to age, gender, year level, course, name of school, school address, residential address, and socioeconomic status among others.

Study Engagement

Utrecht Work Engagement Scale (UWES-9S) Student Version

UWES-9S version was used to measure the study engagements of the students which were characterized by their Vigor, Dedication, and Absorption. The 9-item scale was rated using a seven-point frequency scale with 0 (never) to 6 (always) [21].

Student Resources

PsyCap Questionnaire

PsyCap Questionnaire is a 24- item questionnaire by Luthan et al. (2007) [21] that measures the psychological capital using a 6-point Likert scale ranging from 1 (Strongly Disagree) to 6 (Strongly Agree). The questionnaire has 4 subscales each with 6 items namely, Hope, Optimism, Resilience and Self-Efficacy. The test was adapted to assess the students' PsyCap in their school activities.

Student perception and attitude on E-learning

Students' Experience and Attitude towards E-Learning Questionnaire

To assess students' experience and attitudes toward e-learning, the researchers utilized a researcher-made questionnaire.

RESULTS AND DISCUSSION

This chapter presents the results obtained from the data analyses conducted to address the research questions of the study. The research focused on examining the mediating role of e-learning in relation to student resources and student engagement among college students.

Student Resources

Table 2. Student Resources (Psychological Capital Questionnaire PCQ)

ITEMS	Mean Score	Verbal Interpretation
1. I feel confident analyzing a study-related long-term problem to find a solution.	3.57	Agree
2. If I should find myself in a jam in the course of my studies, I could think of many ways to get out of it.	3.34	Somewhat Agree

3. I usually take stressful things related to my studies in my stride.	3.37	Somewhat Agree
4. I feel I can handle many study-related issues simultaneously.	3.27	Somewhat Agree
5. When things are uncertain for me as a student, I usually expect the best.	3.31	Somewhat Agree
6. I feel confident in representing my position at meetings related to my studies.	3.52	Agree
7. At present I'm eager to meet study goals I have set myself.	3.54	Agree
8. I can deal with study-related difficulties	3.55	Agree
9. If something related to my studies can go wrong, it will	3.38	Somewhat Agree
10. I feel confident in contributing to discussions about my study domain.	3.63	Agree
11. I approach my studies as if "every cloud has a silver lining."	3.62	Agree
12. There are lots of ways around any study-related problem	3.67	Agree
13. If I have to, I can be "on my own," so to speak, in handling my study matters.	3.70	Agree
14. I always look on the bright side of things regarding my studies.	3.74	Agree
15. Right now, I see myself as being pretty successful in my studies.	3.71	Agree
16. I feel confident helping to set study-related targets/goals.	3.64	Agree
17. With regards to my studies, things never work out the way I want them to.	3.34	Somewhat Agree
18. I usually manage study-related difficulties one way or another.	3.56	Agree
19. I'm optimistic about what will happen to me in the future as it pertains to my studies.	3.58	Agree
20. I can think of many ways to reach my current study goals.	3.65	Agree
21. I feel confident contacting other students to discuss problems	3.41	Agree
22. When I have a study-related setback, I have trouble recovering from it and moving on	3.39	Somewhat Agree
23. At present, I am meeting the study goals that I have set myself.	3.52	Agree
24. I feel confident presenting information to other students or my lecturers.	3.57	Agree
GRAND MEAN	3.52	Agree

The table 2 demonstrates a generally positive psychological state among the students, as indicated by a grand mean score of 3.52. This reflects an overall agreement with the statements measuring psychological capital. Specifically, the

Self-Efficacy factor, with a mean score of 3.3967, suggests that students have moderate confidence in their ability to manage study-related tasks. Additionally, the Hope factor, which had a mean score of 3.565, indicates that students possess a strong sense of perseverance toward achieving their academic goals.

Moreover, Resilience, with a mean score of 3.615, highlights a solid ability among students to bounce back from academic challenges. Finally, the Optimism factor, with a mean score of 3.52, shows that students maintain a positive outlook on their future academic success. In summary, these results collectively suggest that the students in the study exhibit a good level of psychological capital, which could positively influence their engagement and success in their studies.

This study supports the study of [21], which finds that self-efficacy; hope and optimism are key predictors of college success. The authors emphasize that students who exhibit their traits are more likely to engage positively with their studies and overcome challenges, indicating that high psychological capital enhances academic persistence and achievement.

Study Engagement

Table 3. Study Engagement Inventory (UWES-9S)

ITEMS	Mean Score	Verbal Interpretation
1. When I'm doing my work as a student, I feel my energy bursting.	5.27	Always
2. I feel energetic and capable when I'm studying or going to class.	5.12	Very Often
3. I am enthusiastic about my studies.	5.68	Always
4. My studies inspire me.	5.26	Always
5. When I get up in the morning, I feel like going to class.	5.49	Always
6. I feel happy when I am studying intensely.	5.30	Always
7. I am proud of my studies.	5.54	Always
8. I am immersed in my studies.	5.29	Always
9. I get carried away when I am studying.	5.11	Very Often
GRAND MEAN	5.34	Always

The table above shows the result of the study engagement inventory of the students. This data provides an overview of the students' engagement levels based on various statements about their academic experiences. The grand mean of 5.34 indicates that overall, students consistently feel highly engaged in their academic work. Furthermore, it means that on average, students are frequently experiencing high levels of energy, enthusiasm, inspiration, and pride in their studies. Statements number 1, 2, and 5 collectively show that students

are experiencing high levels of vigor, characterized by their consistent energy, enthusiasm, and mental resilience in their academic pursuits. This vigor is essential for sustaining motivation and engagement over the long term.

Dedication in this context refers to the sense of significance and pride that students have towards their studies. Statements number 3, 4, and 7 reveals that students demonstrate a high level of dedication to their studies, as they consistently feel enthusiastic, inspired, and proud of their academic work. This dedication is crucial for maintaining a sustained and deep engagement with their studies, leading to better academic outcomes and personal satisfaction.

The statements numbers 6, 8, and 9 are indicative of the students' absorption, which refers to the level of deep involvement and concentration they experience while studying. Absorption is characterized by being fully engrossed in academic tasks, often to the extent that time seems to pass quickly. These statements illustrate that students often experience a high degree of absorption in their studies, characterized by deep focus, immersion, and enjoyment. This absorption is a critical element of academic engagement, as it helps students stay concentrated and committed to their studies, often leading to better learning outcomes.

This result is supported by the study of [22] which reveals that students who experience high levels of vigor and dedication have a positive outlook on their studies and perform better academically. It emphasizes that vigor, characterized by energy and resilience, is essential for sustaining engagement and overcoming academic challenges.

Table 4. Correlation of Student Resources and Study Engagement Inventory

Correlations			
		Students Resources	Study Engagement Inventory
Students Resources	Pearson Correlation Sig. (2-tailed) N	1 234	.392* .000 234
Study Engagement Inventory	Pearson Correlation Sig. (2-tailed) N	.392* .000 234	1 234

The positive correlation of 0.392 indicates that as the availability or quality of student resources increases, study engagement tends to increase as well. This correlation suggests that better access to or use of resources—such as textbooks, study materials, tutoring, and library facilities—tends to enhance how engaged students are in their studies. Engaged students may feel more motivated, focused, and involved in their academic work when they have the necessary resources ([23]; [24]). While there is a relationship between student resources and study engagement, the moderate strength of the correlation indicates that other factors also play a significant role in determining study engagement.

Table 5. E-Learning Experience

ITEMS	Mean Score	Verbal Interpretation
1. The e-learning system provides me with sufficient learning content.	4.06	Agree
2. The e-learning system provides the learning content that I need.	4.08	Agree
3. The overall quality of the instruction I get from online learning is excellent.	3.08	Undecided
4. The instructional website seems to be up to date.	4.05	Agree
5. The instructional website works well.	4.16	Agree
6. The instructional website has clear instructions.	4.00	Agree
7. Would you agree to say that "I am satisfied with my decision to enroll in the online classes?"	3.94	Agree
8. Would you agree to say that "My choice to enroll in online classes was a wise one?"	3.06	Undecided
9. Would you agree to say that "I think I did the right thing when I paid for an online learning service?"	3.18	Undecided
10. Would you agree to say that "I feel that my experience with online learning has been enjoyable?"	4.22	Undecided
11. If I were to engage in social distancing (e.g. by avoiding public transport and social events) I would lessen my chance of developing an infectious disease.	4.18	Agree
12. I am encouraged by engaging in social distancing during times of infectious disease because I feel it would be a necessity to do it.	4.20	Agree
13. I feel confident in my ability to engage in social distancing during times of infectious disease.	4.22	Strongly Agree
GRAND MEAN	3.87	Agree

The table provides insight into students' perceptions of their e-learning experiences, focusing on the adequacy of learning content, the quality of instructional materials, overall satisfaction with online learning, and their attitudes towards social distancing during times of infectious disease. The overall grand mean of 3.87 reflects a generally positive perception of the e-learning experience. Students agree with most of the statements, indicating satisfaction with the content and functionality of e-learning systems, although there are areas, particularly in the perceived quality of instruction and the decision-making process, where there is room for improvement.

The students generally agree that the e-learning system provides sufficient and necessary learning content, with mean scores slightly above 4.00. This suggests that most students

find the content offered through online platforms adequate for their learning needs. The alignment between sufficiency and necessity of content reflects positively on the design and organization of the e-learning curriculum.

In addition, students were undecided on the overall quality of online instruction (3.08), suggesting some reservations about the excellence of the online teaching experience. However, the higher scores for the functionality and clarity of the instructional websites indicate that while the quality of instruction might not be perceived as excellent, the platforms themselves are well-maintained, functional, and easy to navigate. This could imply that while the technological aspect of e-learning is effective, there might be room for improvement in the pedagogical aspects.

While students generally agree that they are satisfied with their decision to enroll in online classes (3.94), they were undecided that their choice was wise and that paying for online learning was the right decision (mean scores of 3.06 and 3.18, respectively). This suggests that while students may be content with their decision, they might not be fully convinced about the value or wisdom of their choice. On a more positive note, students strongly agree that their experience with online learning has been enjoyable (4.22), which may counterbalance their reservations about the decision-making process.

Students express strong agreement with the importance of social distancing during infectious disease outbreaks, with mean scores indicating they recognize the necessity and are confident in their ability to maintain these practices. This shows a high level of awareness and responsibility among students concerning public health measures, which is critical for their safety and the well-being of the community.

Table 6. Attitude towards e-learning

ITEMS	AGREE		DISAGREE	
	F	%	F	%
1. Studying through e-learning mode provides the flexibility to study at the time convenient to the learner.	156	67	76	33
2. E-learning can enable people to study, irrespective of where they are located in the world.	135	58	99	42
3. There are technologies available to enable one to take tests and submit assignments electronically.	179	78	51	22
4. There are electronic tools available to enable interactive communication between instructor and student without meeting face to face.	174	76	56	24
5. There can be interactive communication among students when participating in e-	166	72	64	28

learning.				
6. I don't foresee any usefulness of e-learning.	115	51	112	49
7. Studying through e-learning mode can increase my learning effectively, as I will have easy access to learning materials.	177	77	52	23
8. Learning electronically can improve my course performance as I will not need to travel to campus, but study at the comfort of my home.	162	71	65	29
9. Using an e-learning system can enable me to accomplish tasks more quickly, since I will move at my own pace.	175	75	57	25
10. I believe e-learning platforms are user friendly.	173	81	41	19
11. It would be easy for me to find necessary information when using an e-learning platform.	187	89	24	11

The data presented shows the responses of the participants regarding their attitudes towards e-learning, expressed in terms of agreement or disagreement on the usefulness, flexibility and effectiveness of e-learning. The data indicates that a significant portion of students recognizes the flexibility and global accessibility provided by e-learning platforms. 67% of students agree that e-learning allows them to study at a time that suits them, which underscores one of the primary benefits of this mode of learning. Additionally, 71% of students see value in being able to study from home without the need to travel to campus, which suggests that e-learning not only offers flexibility in scheduling but also in location. Furthermore, 58% agree that e-learning enables people to study from anywhere in the world. However, 42% disagree with this, hinting at potential concerns related to digital divide or connectivity issues that might affect global accessibility.

In addition, most of the students agree that technology plays a crucial role in e-learning. 78% believe that there are technologies available for taking tests and submitting assignments electronically, reflecting confidence in the technical infrastructure that supports e-learning. Similarly, 76% acknowledge that electronic tools facilitate communication between students and instructors without the need for face-to-face meetings. The high agreement rate of 89% that finding necessary information on e-learning platforms is easy further supports the notion that technological tools are well-integrated and effective in supporting students' learning needs.

The ability for students to interact with each other and with instructors is a key element of e-learning. 72% of students

believe that e-learning allows for interactive communication among peers, and 75% feel that it enables them to complete tasks more quickly by allowing them to work at their own pace. Additionally, 81% find e-learning platforms to be user-friendly, suggesting that the design and functionality of these platforms support efficient and engaging interaction.

Lastly, students' perceptions of the effectiveness of e-learning show a mixed picture. While 77% of students agree that e-learning increases learning effectiveness by providing easy access to materials, 51% agree and 49% disagree about the overall usefulness of e-learning. This split suggests that while many students find e-learning beneficial and effective, there remains a significant portion who may not see its advantages or who might be skeptical about its impact on their learning outcomes.

The data reveals that students generally view e-learning positively in terms of flexibility, accessibility, and technological support. The majority find e-learning tools effective and user-friendly, and they appreciate the ability to interact and communicate in an online environment. However, the mixed feelings about the overall usefulness of e-learning and the concerns about global accessibility indicate areas where improvements could be made. Understanding and addressing these areas can help optimize the e-learning experience and better meet the needs of all students.

Mediation Analysis

A mediation analysis was conducted to explore how E-Learning Attitude mediates the relationship between Student Resources (Psyscap) and Study Engagement. The results are summarized in Table 7.

Table 7: Mediation Analysis Results

Effect	Coefficient	p-value
Direct Effect (Psyscap Study Engagement)	0.1573	0.0802
Indirect Effect (Psyscap → E-Learning. Study Engagement)	0.0404	0.0012
Total Effect	0.1977	-

Interpretation:

- **Direct Effect:** The direct effect of Student Resources (Psyscap) on Study Engagement was positive, with a coefficient of 0.1573. However, the p-value (0.0802) suggests that this effect is not statistically significant at the conventional 5% level. This implies that while there is some evidence that higher Psyscap may lead to increased study engagement, this relationship is not strong enough to be conclusive.
- **Indirect Effect:** The indirect effect of Psyscap on Study Engagement through E-Learning Attitude was positive and statistically significant ($p = 0.0012$). This result indicates that E-Learning Attitude significantly mediates the relationship between Psyscap and Study Engagement. In practical terms, students with higher Psyscap are likely to have a more positive attitude towards e-learning, which in turn enhances their engagement in studies.

- **Total Effect:** The total effect, which combines both the direct and indirect effects, shows an overall positive relationship between Psycap and Study Engagement. Although the p-value for the total effect is not directly calculated, the significant indirect effect suggests that the overall relationship is meaningful.

This analysis suggests that E-Learning Attitude has a modest mediating effect on the relationship between Student Resources and Study Engagement among college students.

CONCLUSION

Based on the findings of this study, it can be concluded that E learning experience has a modest mediating effect on the relationship between psych capital or student resources and study engagement among college students. This suggest that psych capital is not enough to ensure study engagement rather a positive e-learning experience together with psych capital can lead to study engagement.

Furthermore, the study highlights the importance of ensuring that e-learning platforms are user-friendly and effectively meet students' educational needs. By addressing these factors, educational institutions can enhance student engagement and satisfaction with e-learning, thereby fostering a more effective and sustainable online learning environment. The insights gained from this study provide valuable information for developing strategies to improve e-learning systems and support students in adapting to this mode of education post-pandemic.

RECOMMENDATIONS

Based on the findings of this study, it is recommended that educational institutions focus on improving the user-friendliness and accessibility of e-learning platforms to enhance students' learning experiences. This can be achieved by providing ongoing technical support, ensuring that instructional materials are up-to-date, and offering training for both students and faculty to maximize the effective use of e-learning tools. Additionally, fostering a positive online learning environment through interactive and engaging content can significantly boost students' perception of e-learning and their willingness to continue using these platforms.

Moreover, institutions should consider implementing regular feedback mechanisms to gather students' opinions on e-learning experiences and identify areas for improvement. By addressing the specific needs and concerns of students, universities can tailor their e-learning programs to better support academic engagement and success. Further research could also explore the long-term effects of e-learning on student outcomes to refine and enhance online education strategies in the future.

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