A STUDY TO ESTABLISH AN ONLINE LEARNING ENVIRONMENT FOR ENHANCING COGNITIVE PEDAGOGY PRINCIPLES AND INSTRUCTIONAL STRATEGIES.

Qu Cha, Sreemoy Kanti Das

[1] Lincoln University College, Petaling Jaya, Malaysia.

ABSTRACT

This study aims to present a suitable online learning environment so as to improve the use of instructional methods and cognitive pedagogy ideas in digital education. Growth of virtual platforms that not only surpasses the availability of academic information but also actively promotes the cognitive growth of students is desperately needed to meet the always growing demand for online education. Under the direction of numerous theories of cognitive learning, this study looks at how well well-planned classrooms including technology might increase student involvement, critical thinking, and memory retention. Within the framework of this study, the adoption of an online learning environment functions as the independent variable; the improvement of cognitive pedagogy concepts and instructional techniques functions as the dependent variable. The study looks at how elements like scaffolding, interaction, feedback, and learner autonomy—all of which are very essential components of course design—have effects on the cognitive and instructional quality of online learning. Along with quantitative data gathered from the job and student responses, this method included qualitative findings. The results must provide teachers and instructional designers with direction that may be used to create learner-centred, cognitively enhanced online courses. Finally, by linking theory and practice in the field of online pedagogy, the results help to improve the quality and efficiency of digital learning environments.

Keywords: Online Learning Environment, Cognitive Pedagogy Ideas, Digital Education, Instructional Techniques, Student Involvement.

INTRODUCTION

Online learning environments have become critical to contemporary pedagogy as a result of worldwide movements towards digital education. These environments provide learners with solutions that are both adaptable and scalable, allowing them to meet the ever-increasing expectations of learners. On the other hand, the efficacy of these platforms is not only dependent on the technological infrastructure, but also on the careful incorporation of educational ideas that are designed to improve cognitive growth. The focus of cognitive pedagogy is on the

ways in which students think, learn, and absorb information. It places an emphasis on active participation, metacognition, and the application of knowledge in relevant situations. In spite of the development of online resources, many courses continue to fail to link instructional design with cognitive learning demands, which results in learning experiences that are passive (Castelli & Sarvary, 2021). Through the establishment of an online learning environment that is especially built to strengthen cognitive pedagogy principles and instructional tactics, the purpose of this study is to fill this gap in knowledge. The purpose of this study is to examine the ways in which components like as organised scaffolding, timely feedback, learner autonomy, and interactive exercises might be included into the design of a course in order to encourage critical thinking and significant learning. The enhancement of cognitive pedagogy and instructional tactics are the dependent factors, whereas the course design is considered to be the independent variable in this study. By concentrating on this aspect, the research attempts to ascertain the influence that purposeful design has on the cognitive engagement of learners and the efficiency of instruction respectively. The research offers a paradigm for educators and instructional designers to follow in order to develop digital experiences that are relevant and designed with the learner in mind. This is accomplished by establishing the online environment on cognitive theory and instructional best practices. The results are anticipated to support the development of future frameworks for online education that not only prioritise cognitive development, instructional quality, and long-term educational effect, but also make it easier for students to obtain training. This research helps to bridge the gap between educational technology and evidence-based pedagogy in digital learning environments, which is becoming increasingly important as the demand for efficient virtual learning continues to increase (Alam et al., 2025).

BACKGROUND OF THE STUDY

The digital transformation of education has been accelerating in recent years, and this has led to online learning being a main teaching tool used in all educational levels. This followed directly from the rapid pace of the digital revolution. This change raises questions regarding the efficacy and quality of the training that is being given even if it lets more people have more freedom and access. Usually emphasising material transmission more than cognitive engagement, these traditional online learning environments limit their ability to foster strong understanding and long-term memory of knowledge. People so are less inclined to keep learning in these surroundings. More successful online learning experiences have a great foundation in the use of cognitive pedagogy, which stresses on the manner in which students absorb knowledge, solve issues, and improve their metacognitive skills. One can find this paradigm at many different educational establishments (Schwenck & Pryor, 2021).

Research has shown that instructional tactics that are founded on cognitive notions, such as scaffolding, feedback loops, learner autonomy, and active learning, have the potential to dramatically improve academic performance, critical thinking, and understanding. This has been demonstrated via the use of research. tactics such as scaffolding, feedback loops, and active learning are examples of such tactics. The vast majority of online learning environments, on the other hand, do not fully include these concepts, which results in learning that is passive and superficial. This is a significant problem to consider. The analysis of the several ways in which digital platforms may be purposefully built to actively promote cognitive engagement and to provide meaningful learning experiences is a field of research that is becoming an increasingly significant topic of study (Ayob et al., 2020).

PURPOSE OF THE RESEARCH

The main purpose of this study is to investigate the many ways in which the principles of cognitive pedagogy may be enhanced by incorporating social support into an online learning environment. If the researcher want to be successful in the field of education, it is essential to have a strong grasp of how social dynamics impact cognitive growth. This is because the relevance of digital learning platforms is continuing to climb more and further. Explore the ways in which various forms of social support, such as emotional, informational, and cooperative support, contribute to the implementation of cognitive pedagogy concepts like active learning, metacognition, learner-centred instruction, and the development of meaningful knowledge. The purpose of this research is to investigate the ways in which these types of social support contribute to the implementation of these concepts. To evaluate whether or not social interactions among peers and with teachers improve learners' cognitive engagement, motivation, and academic performance, this study emphasises on the function of social support as an embedded component within course design. The purpose of this study is to discover whether or not social support plays a part in the design of courses. In addition to this, the research attempts to ascertain the manner in which these social interactions take place. For the purpose of assisting legislators, instructional designers, and educators in the process of building successful online learning environments, this research was carried out with the objective of providing guidance. These places should not only give material, but they should also provide an atmosphere that is friendly and intellectually interesting when it comes to the surroundings.

LITERATURE REVIEW

Concerns continue to be expressed regarding the cognitive depth and instructional quality of a great number of digital platforms. This is the case regardless of whether or not the increasing dependence on online learning settings has altered the manner in which knowledge is sent and received. According to the findings of research that

has been carried out, online learning does not always conform to the principles of evidence-based cognitive pedagogy, despite the fact that it provides flexibility and access. In order to cultivate learning that is not only profound but also long-lasting, it is very necessary to adhere to these standards. In cognitive pedagogy, the primary focus is on investigating how students perceive the subject matter, how they take in information, and how they develop their understanding of it. Memorisation, attentiveness, metacognition, and critical thinking are some of the qualities that are emphasised by this technique. There are a number of successful instructional practices that have their roots in theory that may be found within the area of online education. Among the several strategies that are included in this category are scaffolding, interactive feedback, active learning, and metacognitive help, to mention just a few examples. Due to the assistance that these technologies offer, the students are able to make connections, think about what they have learnt, and use the knowledge that they have obtained in ways that are important to them (Alda et al., 2020). It has been demonstrated that when such strategies are utilised in online environments, students exhibit increased engagement, greater retention, and improved academic accomplishments. This is according to the findings of a study that was carried out by Martin et al. in the year 2020. There is also the fact that the majority of online courses continue to rely mostly on passive information delivery techniques, which are not efficient in boosting higher-order thinking abilities. This is still the case. This is the situation, despite the fact that it has been proved that carrying out these treatments has a number of benefits. As a result of the existence of this gap, it is of the utmost importance that cognitive ideas be included into virtual environments through the utilisation of intentional instructional design. Specifically, this is due to the fact that the existence of this gap drives home the need of doing just that. The autonomy of students and the ability to self-regulate their own learning have emerged as two of the most important components that must be present for online education to be successful. Consequently, this highlights the need of providing support for cognitive activity that is independent of any other activity. Moreover, during the course of the previous few years, there has been a constant growth in the number of persons who are engaging in online classes (Moore & Miller, 2022).

RESEARCH QUESTIONS

What is the influence of Social Support on Enhancing Cognitive Pedagogy Principles?

RESEARCH METHODOLOGY

RESEARCH DESIGN

The quantitative data analysis used SPSS version 25. The odds ratio and 95% confidence interval were used to determine the degree and direction of the statistical association. The researchers established a statistically significant criteria

at $p < 0.05$. A descriptive analysis was conducted to identify the main features of the data. Quantitative methods are often used to assess data collected via surveys, polls, and questionnaires, as well as data altered by computing tools for statistical analysis.

SAMPLING

A convenient sampling technique was applied for the study. The research relied on questionnaires to gather its data. The Rao-soft program determined a sample size of 80. A total of 120 questionnaires were distributed; 112 were returned, and 16 were excluded due to incompleteness. In the end, 96 questionnaires were used for the research.

DATA AND MEASUREMENT

The primary method of collecting data for research was questionnaire surveys. In section A, participants were requested to provide fundamental demographic data; in section B, they were instructed to evaluate the significance of many channels, both online and offline, using a 5-point Likert scale. A diverse array of secondary sources, including online databases, was meticulously examined to get the necessary information.

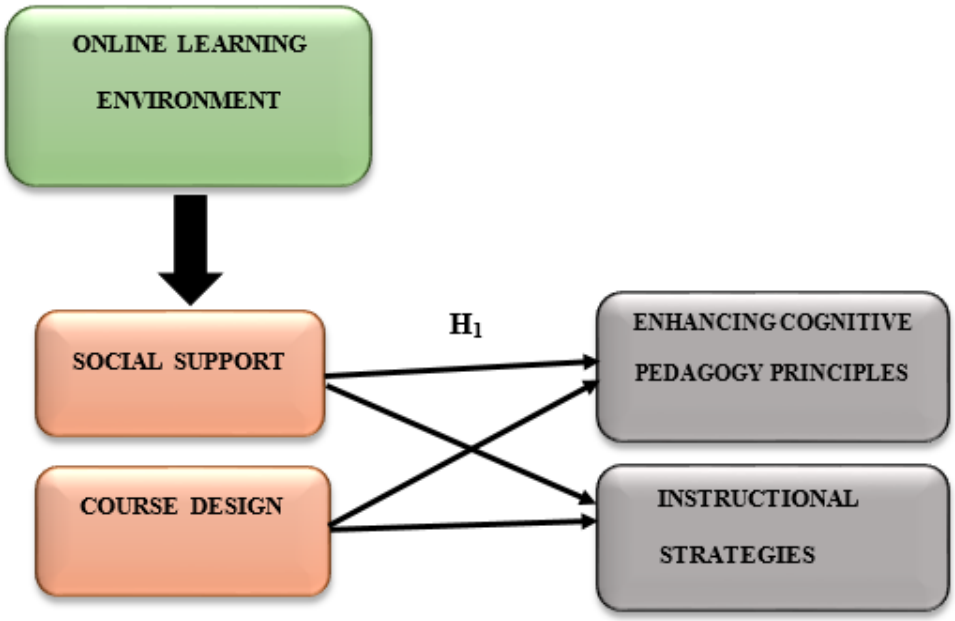
STATISTICAL SOFTWARE

The statistical analysis was conducted using SPSS 25 and MS-Excel.

STATISTICAL TOOLS

To grasp the fundamental character of the data, descriptive analysis was used. The researcher is required to analyse the data using ANOVA.

CONCEPTUAL FRAMEWORK



RESULT

Factor Analysis: One typical use of Factor Analysis (FA) is to verify the existence of latent components in observable data. When there are not easily observable visual or diagnostic markers, it is common practice to utilise regression coefficients to produce ratings. In FA, models are essential for success. Finding mistakes, intrusions, and obvious connections are the aims of modelling. One way to assess datasets produced by multiple regression studies is with the use of the Kaiser-Meyer-Olkin (KMO) Test. They verify that the model and sample variables are representative. According to the numbers, there is data duplication. When the proportions are less, the data is easier to understand. For KMO, the output is a number between zero and one. If the KMO value is between 0.8 and 1, then the sample size should be enough. These are the permissible boundaries, according to Kaiser: The following are the acceptance criteria set by Kaiser: A pitiful 0.050 to 0.059, below average 0.60 to 0.69

Middle grades often fall within the range of 0.70-0.79. With a quality point score ranging from 0.80 to 0.89. They marvel at the range of 0.90 to 1.00. Testing for KMO and Bartlett's Sampling Adequacy Measured by Kaiser-Meyer-Olkin 0.79

The results of Bartlett's test of sphericity are as follows: approx. chi-square

df=190

sig.=.000

This establishes the validity of assertions made only for the purpose of sampling. To ensure the relevance of the correlation matrices, researchers used Bartlett's Test

of Sphericity. Kaiser-Meyer-Olkin states that a result of 0.79 indicates that the sample is adequate. The p-value is 0.00, as per Bartlett's sphericity test. A favourable result from Bartlett's sphericity test indicates that the correlation matrix is not an identity matrix.

Table 1: KMO and Bartlett's Test.

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure Of Sampling Adequacy.		0.79
Bartlett's Test of Sphericity	Approx. Chi-Square	1171.54
	Df	231
	Sig.	0.000
a. Based on correlations		

The first stage in exploratory factor analysis (EFA) is to ascertain the data's appropriateness for factor analysis. Kaiser advised postponing factor analysis until a sample adequacy coefficient over 0.5 is achieved, as shown by the KMO (Kaiser-Meyer-Olkin) measure. The KMO value derived from the data used in this analysis is 0.79. Bartlett's test of sphericity yielded a significant result of 0.00.

INDEPENDENT VARIABLE

Online Learning Environment: A digital platform or ecosystem developed with the express purpose of facilitating online instruction and student engagement is known as an online learning environment (OLE). Teachers and students from all over the world may work together in a safe and engaging environment to teach and learn from one another by exchanging ideas and evaluating each other's work. Google Classroom, Moodle, and Blackboard are some examples of LMSs that are commonly used to construct these kind of environments. Video conferencing, online forums, quizzes, electronic books, multimedia resources, and virtual laboratories are just a few of the features offered by these platforms. Along with providing students with the necessary course materials, high-quality online courses should encourage active engagement, intellectual growth, and genuine interaction between students. Active learning strategies such as group projects, real-time feedback, self-paced courses, and adaptable materials are used in their lessons. Their importance lies in the fact that they cater to a wide range of learning styles and requirements while also providing options for when, where, and how instruction may be given. The researcher may improve the metacognition, critical thinking, and problem-solving skills by taking part in an online learning environment that uses principles from instructional design and cognitive pedagogy. If executed well, it improves students'

education by giving them access to global resources, allowing them to personalise their learning experience, and facilitating material engagement similar to that of a traditional classroom. It is very important in today's classrooms, especially when students are required to enrol in hybrid or online courses (Schwenck & Pryor, 2021).

FACTOR

Social Support: By "social support," the researcher mean the aid that individuals receive from their social networks, which may include their families, friends, peers, and communities. The word "social support" is used to describe this assistance. It is possible for this assistance to be of an emotional, informational, or practical character. An individual's capacity to manage stress, increase well-being, and maintain both psychological and physical health can be improved via the use of this approach, which incorporates the expression of empathy, encouragement, guidance, and actual support. Emotional support, which includes empathy and care, informational support, which includes direction and feedback, and instrumental support, which includes help or services that are practical in nature, are all examples of the several ways that social support may be delivered. The development of a sense of belonging, the lessening of feelings of isolation, and the increase of resilience are all outcomes that are influenced by the many sorts of support that are available. Social support plays a number of significant functions in educational and cognitive contexts, one of the most essential of which is the formation of an environment that is constructive and engaging, and which is favourable to learning and growth. It is of critical importance in fostering increased levels of motivation and engagement, as well as cognitive growth. As a consequence of the fact that the perceived availability and quality of social support are usually more crucial than the actual quantity of assistance received, it is a vital component in both the success of academic goals and the enjoyment of one's own personal life (Zhang et al., 2021).

DEPENDENT VARIABLE

Enhancing Cognitive Pedagogy Principles: Implementing and supporting instructional techniques that align with students' learning, processing, and application processes is what "improving cognitive pedagogy principles" refers to. Cognitive pedagogy rests on five pillars: memory, focus, perception, reasoning, and problem-solving. This way of learning originally appeared in the field of cognitive psychology. It is crucial to intentionally construct educational settings that foster critical thinking, comprehensive knowledge, and the development of metacognitive awareness in order to bolster these concepts. The main components of cognitive pedagogy include idea mapping, active learning, scaffolding, practice with retrieval, feedback, and self-explanation. Research aimed at enhancing cognitive development and academic achievement provides the basis for these tactics. By emphasising these concepts, educators may design lessons that encourage students to think critically, do independent research, and apply classroom knowledge in

authentic situations. Technology, interactive materials, and student-centered techniques are the backbone of modern classrooms, cognitive pedagogy, and online learning in particular. In this context, supporting group projects, using adaptable material, and providing opportunities for self-regulated learning are all part of the picture. The development of concepts connected to cognitive pedagogy is the primary factor that determines the character of instructional design. As a result, comprehension is enhanced, cognitive engagement is increased, and learning performance is enhanced (Rapanta et al., 2020).

Relationship between Social Support and Enhancing Cognitive Pedagogy Principles: Social support is a vital component in the process of strengthening cognitive pedagogy ideas. This is due to the fact that it has a direct influence on the students' motivation, engagement, processing speed, and retention. The fundamental tenets of cognitive pedagogy are the ideas of meaningful learning, higher-order thinking, and the active construction of information. One's ability to feel emotionally, socially, and intellectually supported in their learning environment is a significant factor that contributes to the enhancement of these abilities. This, in turn, leads to an increase in cognitive engagement and a decrease in cognitive overload. A sense of belonging is developed through supportive interactions with instructors, mentors, and peers when these ties are established. Students are more likely to develop fundamental skills in cognitive pedagogy, such as discussion, testing of assumptions, and the co-construction of knowledge, when they collaborate on projects. According to the idea of social constructivism proposed by Vygotsky, learning is mediated by social interaction, and meaningful social engagement is a key factor in accelerating cognitive development. A further benefit of having someone the researcher can depend on during difficult times is that it encourages self-regulation, perseverance, and taking chances in the pursuit of knowledge. Important for the development of cognitive abilities, it also helps to create resilience and a sense of self-efficacy. The use of teacher scaffolding, planned cooperative learning activities, and peer tutoring are all examples of educational approaches that combine both the intellectual and interpersonal components of learning (Pulgar et al., 2022).

Based on the above discussion, the researcher generated the following hypothesis to examine the link between Social Support and Enhancing Cognitive Pedagogy Principles.

H_{01}: There is no significant relationship between Social Support and Enhancing Cognitive Pedagogy Principles.

H_1: There is a significant relationship between Social Support and Enhancing Cognitive Pedagogy Principles.

Table 2: H1 ANOVA Test.

ANOVA					
Sum					
	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	39588.620	21	5385.369	1,052.858	.000
Within Groups	492.770	75	5.115		
Total	40081.390	96			

In this study, the result is significant. The value of F is 1,052.858, which reaches significance with a p-value of .000 (which is less than the .05 alpha level). This means the **"H_1: There is a significant relationship between Course Design and Enhancing Cognitive Pedagogy Principles."** Is accepted and the null hypothesis is rejected.

DISCUSSION

This study sought to investigate how social support in an online classroom may enhance the implementation of ideas from cognitive pedagogy. The findings indicate that rather than only an outside effect, social support is a necessary component of what drives students to question course content. When students may see a decline in motivation and cognitive engagement owing to physical isolation, structured and meaningful social support considerably increases their capacity to acquire, assess, and apply new knowledge in the setting of online learning. Encouragement of cooperative learning and cognitive engagement depends critically on including social interaction tools such group projects, real-time feedback, instructor-led question and answer sessions, and peer discussion boards. This aligns well with Vygotsky's social constructivist theory, which holds that group learning is most effective as these instruments provide for the sharing of abilities for critical thinking, emotional support, and answers to issues. When teachers were actively involved and students had supporting peer networks, learners were also more likely to engage in metacognitive reflection, critical questioning, and intellectual risk-taking. The results showed that students who believed they had a lot of social support were more likely than those who felt they had none to stick to it and learn more. Overall, the findings reveal that the facilitation of meaningful learning experiences in a well-designed online learning environment including robust social support networks enhances the cognitive pedagogy concepts. Including social interaction strategies into digital learning environments can help teachers and course designers to promote students's active cognitive engagement and general academic progress.

CONCLUSION

Investigating the manner in which social support in an online learning environment shapes the evolution of ideas connected with cognitive pedagogy was one of the main goals of this study. The results clarify the critical need of social support in promoting cognitive growth, raising learner involvement, and enhancing the efficacy of instructional practices. Students who feel as though they are being emotionally and socially supported are more likely to participate actively in the processes of information, engage in metacognitive activities, and delve deeper in their thinking. Possible ways of this support are lessons taught by teachers, projects involving students working together, and online communities created. The course's architecture included the integration of social support systems to help to link cognitive pedagogy with instructional approaches. Among the other systems implemented were peer mentorship, discussion boards, real-time comments, and group projects. These traits helped the kids to do better academically and also created a welcoming and motivating learning environment that simultaneously promoted tenacity, drive, and introspective thinking. Finally, the results of this study show that including good social support networks into an online learning environment enables a notable enhancement of the cognitive pedagogy ideas under investigation. Teachers and course designers should try to include social support networks into their curricula if they really wish for their students to thrive in online environments.

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