

Original Article

Student Nurses' Perception of Online Learning Using Constructivist Online Learning Environment Survey (COLES) in a Selected University

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Abstract

Background: The rapid advancement of technology has significantly transformed the landscape of education, and online learning has emerged as a visible and effective mode of instruction offering flexibility and accessibility to a diverse range of learners. This study addresses this gap by assessing student perceptions of their online learning experience using the Constructivist Online Learning Environment Survey (COLES).

Methodology: The study adopted a descriptive study approach to investigate the different scales of the Constructivist Online Learning Environment Survey. A self-administered questionnaire was administered to the first-year Student Nurses of a Selected Local University via an online data-gathering tool.

Findings: The result revealed the composite mean is 4.24 or "Always", whereas relevance ($m=4.64$), the indicator "what I learn is important for my professional practice" scored a mean of 4.85 with a verbal interpretation of "Always". While, tutor support ($m=4.42$), interpretation ($m=4.29$), and reflective thinking ($m=4.28$), got an "Always" verbal interpretation. The composite mean for Interactivity is 3.87 or a verbal interpretation of "often", the indicator "I ask other students to explain their ideas" scored a mean of 3.92 with a verbal interpretation of "often".

Discussion: COLES is grounded in constructivist learning theory and assesses key aspects of the online learning experience. COLES offers valuable data to inform instructional design and promote a richer, more engaging, and ultimately more effective online learning experience. Also, COLES assesses both interactivity and peer support, recognizing the importance of collaboration and communication in knowledge construction. Furthermore, the role of the instructor, or tutor support, remains vital in a constructivist online environment.

Conclusions: The findings from the study were generally effective in fostering student engagement and learning. Student Nurses perceived the course content as relevant, the instructional strategies as effective, and the support provided by the instructors as helpful. Understanding learner perceptions in these key areas allows educators to create online environments that empower learners to actively construct their knowledge, collaborate with their peers, and achieve their full learning potential.

Key Words: Constructivist, Online Learning Environment, Student Nurses

Introduction

The rapid advancement of technology has significantly transformed the landscape of education, and online learning has emerged as a visible and effective mode of instruction offering flexibility and accessibility to a diverse range of learners. This can also be seen in the

field of nursing education. A successful implementation of online learning necessitates a careful consideration of pedagogical approaches that can foster meaningful overall learning experience. One of the learning theories that emphasizes active learner engagement and knowledge construction is

constructivism, this gained prominence in online education (Sato, et al., 2023).

Traditional classroom settings are effective, often limit the scope of healthcare education like nursing education (Kang and Kim, 2021). Online learning provides a platform for students to access educational materials and engage with peers and instructors from anywhere and anytime (Saluky and Bahiyah, 2023). This flexibility can be particularly beneficial for working nurses and students with family commitments (Adhikari, et al., 2024). The transition to online learning presents unique challenges, such as the need to create a supportive and engaging learning environment that promotes active learning and critical thinking (Sato, et al., 2024). Constructivist online learning environments (COLEs) have been proposed as a solution to this challenge. COLEs are designed to encourage learners to actively construct knowledge through interaction with the learning materials and with other learners. Some of the key features of COLEs are active learning, social interaction, authentic learning, and reflective learning. While the instructor plays a crucial role in creating and maintaining the success of COLEs, they are responsible in facilitating learning, creating a supportive learning environment, utilizing effective instructional strategies, and providing timely and meaningful feedback (Archambault, et al., 2022).

Assessing student learning in online environments is essential to ensure that learning outcomes are being met. Traditional assessment methods, such as paper-based tests, may not be appropriate for online learning. Alternative assessment methods, such as online quizzes, discussion board postings, and reflective journals, can be used to assess a variety of learning outcomes (Amer, et al., 2022). While there is a growing body of research on the effectiveness of online learning, there is a need for more research on the specific impact of COLEs on student learning outcomes in nursing education. This study aims to address this gap by assessing student perceptions of their online learning experience using the Constructivist

Online Learning Environment Survey (COLES).

By understanding students' perceptions of their online learning experience, we can identify areas for improvement and develop strategies to enhance the quality of online nursing education. This study will contribute to the development of effective and engaging online learning environments that promote student success.

Methodology

Study Design: The study adopted a descriptive study approach to investigate the different scale of the Constructivist Online Learning Environment Survey, the following are, relevance, reflection, interactivity, tutor support, peer review, and interpretation. This study approach involves gathering and analyzing data to describe the learners' preference in the course implementation and engagement in a constructivist learning environment through the 24 questions provided. The researcher used to evaluate their responses on six areas such as, (1) relevance, (2) reflection, (3) interactivity, (4) tutor support, (5) peer review, and (6) interpretation.

Site of the Study: The study was conducted selected local University offering undergraduate Nursing program inside Metro Manila. The locale also offers other Allied Health programs such as BS Psychology, BS Pharmacy and BS Radiologic Technology.

Research Instrument: This study utilizes the Constructivist Online Learning Environment Survey (COLLES) to assess the perceptions of the online learning environment as applied in their course Anatomy and Physiology during their first year in the Nursing program (Taylor and Maor, 2000). All students enrolled in the course were provided with the COLLES tool that was built-in from the Learning Management System (LMS) of the University's Technology Based Learning Hub. Informed consent and invitation to participation was provided during week 1 of the course to acquire the learners' preference in the course implementation and engagement in a constructivist learning environment through the 24 questions provided. The researcher evaluated their responses on six scales of (1)

relevance, (2) reflection, (3) interactivity, (4) tutor support, (5) peer review, and (6) interpretation. Relevance refers to how relevant online learning is to students' professional practice. Reflection addresses if online learning does stimulate students' critical reflective thinking. Interactivity shows the extent that students do engage online in rich educative dialogue. Tutor support focuses on how well tutors enable students' participation in online learning. Peer support covers the extent to which fellow students provide sensitive and encouraging support. Interpretation shows whether students and tutors make good sense of each other's communications (Taylor & Maor, 2000).

Data Gathering and Analysis: The data gathered last August 17, 2024 to August 24, 2024, where a total of forty (40) respondents participated in the study. The self-administered questionnaire asked question related to relevance, reflection, interactivity, tutor support, peer review, and interpretation, which are components of the built-in Constructivist Online Learning Environment Survey in the University's Technology Based Learning Hub. A 4-point Likert scale was utilized in the study, 4 (Always), 3 (often), 2 (sometimes) and 1 (Never) for all 6 scales. The data was gathered using an online data gathering tool (Google Forms) and then encoding the data in Jamovi, a 3rd generation statistical spreadsheet. The data was statistically tested utilizing the following statistical instruments: mean, and standard deviation.

Ethical Consideration: This research was conducted ethically, ensuring credibility and protecting participants. This study involved data gathering with students as part of a course on Anatomy and Physiology, and that the activity was carried out with the full knowledge and understanding of relevant Institute officials. This study adheres to the Belmont Report's principles of respect for persons, beneficence, and justice. Participants were fully informed about the study, had the autonomy to decide whether or not to participate, without any consequences for declining. Researchers answered all questions honestly, and participants could withdraw at any time without penalty. No coercion or exploitation was used, and all information provided was kept confidential, protecting both the data and the participants' identities. Participants were informed of the educational nature of the project and their right to decline participation, ensuring that engagement was voluntary and risk was minimized.

Findings

Table 1 presents data on an individual's learning preferences and perceptions, focusing on three key indicators, focus on interesting issues, relevance to professional practice, and perceived improvement. And reveals the result for the mean and standard deviation of relevance. The composite mean of 4.64 or Always, the indicator "what I learn is important for my professional practice" scored a mean of 4.85 with a verbal interpretation of "Always".

Table 1: Result of Mean and Standard Deviation of Relevance

INDICATORS	Mean	SD	Verbal Interpretation
My learning focuses on issues that interest me	4.47	.554	Always
What I learn is important for my professional practice	4.85	.427	Always
I learn how to improve my professional practice	4.50	.599	Always
What I learn connects well with my professional practice	4.72	.506	Always

Composite Mean	4.64	.349	Always
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Legend: 4.21 – 5.00 – *Always*; 3.41 – 4.20 – *Often*; 2.61 – 3.40 – *Sometimes*; 1.81 – 2.60 – *Seldom*; 1.00 – 1.80 – *Never*;
SD – *Standard Deviation*

Table 2 presents data regarding an individual's engagement in critical thinking across four specific areas, how they learn, their own ideas, other students' ideas, and ideas within readings. And reveals the result for the mean and standard deviation of reflective thinking. The composite

mean of 4.28 or Always, the indicator “I think critically about how I learn” scored a mean of 4.35 with a verbal interpretation of “Always”. While indicator “I think critically about other students' ideas” scored a mean of 4.03 or a verbal interpretation of “often”.

Table 2: Result of Mean and Standard Deviation of Reflective Thinking

INDICATORS	Mean	SD	Verbal Interpretation
I think critically about how I learn	4.35	.662	Always
I think critically about my own ideas	4.40	.709	Always
I think critically about other students' ideas	4.03	.768	Often
I think critically about ideas in the readings	4.33	.730	Always
Composite Mean	4.28	.577	Always

Legend: 4.21 – 5.00 – *Always*; 3.41 – 4.20 – *Often*; 2.61 – 3.40 – *Sometimes*; 1.81 – 2.60 – *Seldom*; 1.00 – 1.80 – *Never*;
SD – *Standard Deviation*

Table 3 presents data regarding an individual's engagement in interactive learning practices, specifically focusing on explaining ideas to others, requesting explanations from others, and receiving feedback on their ideas. And reveals the result for

the mean and standard deviation of interactivity. The composite mean of 3.87 or “often”, the indicator “I ask other students to explain their ideas” scored a mean of 3.92 with a verbal interpretation of “often”.

Table 3: Result of Mean and Standard Deviation of Interactivity

INDICATORS	Mean	SD	Verbal Interpretation
I explain my ideas to other students	3.90	.982	Often
I ask other students to explain their ideas	3.92	1.118	Often
Other students ask me to explain my ideas	3.75	.899	Often
Other students respond to my ideas	3.90	.841	Often
Composite Mean	3.87	0.813	Often

Legend: 4.21 – 5.00 – *Always*; 3.41 – 4.20 – *Often*; 2.61 – 3.40 – *Sometimes*; 1.81 – 2.60 – *Seldom*; 1.00 – 1.80 – *Never*;
SD – *Standard Deviation*

Table 4 presents data evaluating the effectiveness of a tutor across four key pedagogical dimensions, stimulating thinking, encouraging participation, modeling good discourse, and modeling critical self-reflection. And reveals the result for the mean and standard deviation of tutor support. The

composite mean of 4.42 or “Always”, the both indicator “the tutor encourages me to participate” and “the tutor models good discourse” scored a mean of 4.50 with a verbal interpretation of “Always”.

Table 4: Result of Mean and Standard Deviation of Tutor Support

INDICATORS	Mean	SD	Verbal Interpretation
The tutor stimulated my thinking	4.35	.622	Always
The tutor encourages me to participate	4.50	.555	Always
The tutor models good discourse	4.50	.599	Always
The tutor models critical self-reflection	4.35	.736	Always
Composite Mean	4.42	.547	Always

Legend: 4.21 – 5.00 – Always; 3.41 – 4.20 – Often; 2.61 – 3.40 – Sometimes; 1.81 – 2.60 – Seldom; 1.00 – 1.80 – Never;
SD – Standard Deviation

Table 5 presents data exploring the perceived social support and value within a learning environment, specifically focusing on how other students interact with an individual. And reveals the result for the mean and standard deviation of peer support. The

composite mean of 3.92 or “often”, the indicator “other students encourage my participation” scored a mean of 4.03 with a verbal interpretation of “often”.

Table 5: Result of Mean and Standard Deviation of Peer Support

INDICATORS	Mean	SD	Verbal Interpretation
Other students encourage my participation	4.03	.974	Often
Other students praise my contribution	3.80	.911	Often
Other students value my contribution	3.95	.846	Often
Other students empathize with my struggle to learn	3.90	.900	Often
Composite Mean	3.92	.805	Often

Legend: 4.21 – 5.00 – Always; 3.41 – 4.20 – Often; 2.61 – 3.40 – Sometimes; 1.81 – 2.60 – Seldom; 1.00 – 1.80 – Never;
SD – Standard Deviation

Table 6 presents data concerning an individual's perception and experience of effective communication within a learning environment,

specifically focusing on message clarity and comprehension between the individual, their peers, and the tutor. And reveals the result for the mean

and standard deviation of interpretation. The composite mean of 4.29 or “Always”, the indicator “I make good sense of the tutor's messages” scored

a mean of 4.50 with a verbal interpretation of “Always”.

Table 6: Result of Mean and Standard Deviation of Interpretation

INDICATORS	Mean	SD	Verbal Interpretation
I make good sense of other students' messages	4.28	.554	Always
Other students make good sense of my messages	4.00	.599	Often
I make good sense of the tutor's messages	4.50	.599	Always
The tutor makes good sense of my messages	4.40	.672	Always
Composite Mean	4.29	.496	Always

Legend: 4.21 – 5.00 – *Always*; 3.41 – 4.20 – *Often*; 2.61 – 3.40 – *Sometimes*; 1.81 – 2.60 – *Seldom*; 1.00 – 1.80 – *Never*; SD – Standard Deviation

Table 7 presents the summarized data from the relevance, reflective thinking, interactivity, tutor support, peer support, and interpretation, the different parts of the constructivist online learning environment survey. The summary result revealed

the composite mean is 4.24 or “Always”, whereas relevance (m=4.64), tutor support (m=4.42), interpretation (m=4.29), and reflective thinking (m=4.28), got a “Always” verbal interpretation.

Table 7: Summary Table of Mean and Standard Deviation of Constructivist Online Learning Environment Survey

COLES	Mean	SD	Verbal Interpretation
Relevance	4.64	.349	Always
Reflective Thinking	4.28	.577	Always
Interactivity	3.87	.813	Often
Tutor Support	4.42	.547	Always
Peer Support	3.92	.805	Often
Interpretation	4.29	.496	Always
Mean	4.24	.598	Always

Legend: 4.21 – 5.00 – *Always*; 3.41 – 4.20 – *Often*; 2.61 – 3.40 – *Sometimes*; 1.81 – 2.60 – *Seldom*; 1.00 – 1.80 – *Never*; SD – Standard Deviation

Discussion

The Constructivist Online Learning Environment Survey (COLES) offers a valuable lens through which to examine and understand the dynamics of online learning (Taylor, 2000; Wu, et al. 2022). COLES is grounded in constructivist learning theory, and assesses key aspects of the online learning experience from the learner's perspective. It also provides educators with data-driven insights to refine and enhance their online pedagogy (McKinney, 2021). Constructivism, as a learning philosophy, emphasizes the active role of the learner in constructing knowledge and meaning through experience and reflection (Mitry, 2021). COLES focuses on elements that facilitate this active construction, and moving beyond simply delivering content to fostering a rich and engaging learning environment.

One of the core principles underpinning COLES is the importance of relevance. Constructivist learning thrives when learners can connect new information to their existing knowledge base and see its practical application in real-world contexts (Renninger, 2024). As measured by COLES a high perception of relevance indicates that learners find the content meaningful and applicable to their lives or future careers. This connection to real-world scenarios motivates learners, driving deeper engagement and fostering a sense of purpose in their studies. When learners perceive course content as relevant, they are more likely to invest the time and effort needed to actively construct their understanding (Quinlan and Renninger, 2022).

Reflective thinking forms another cornerstone of constructivist learning and is a key component assessed by COLES. The survey explores the extent to which the online environment encourages learners to critically examine the material, analyze their own understanding, and apply their knowledge to new situations (Alt, et al. 2022). Reflective activities, such as journaling, case study analysis, and problem-based learning, promote higher-order thinking skills and allow learners to develop a deeper, more nuanced understanding of the subject matter (Whalen and Paez, 2020). COLES provides valuable feedback on the effectiveness of these strategies in promoting reflective thinking within the online context.

While content relevance and reflective activities contribute to individual learning, the social dimension is equally crucial in constructivist pedagogy. COLES assesses both interactivity and peer support, recognizing the importance of collaboration and communication in knowledge construction. Interactivity encompasses learner engagement with the instructor, the content, and with other learners (Wu, et al. 2022). Online discussions, group projects, and collaborative problem-solving provide opportunities for learners to share their perspectives, challenges, and build upon each other's ideas (Hussein, 2021). Peer support focuses on the sense of community and connection among learners. Online support environment fosters a sense of belonging, encourages active participation, and reduces feelings of isolation that can sometimes characterize online learning (Raaper, et al., 2021). COLES helps identify the strengths and weaknesses of the online environment in facilitating these crucial social aspects of learning.

The role of the instructor, or tutor support, remains vital in a constructivist online environment. While the focus shifts from direct instruction to facilitation, the instructor's guidance and support are essential for learner success (Conklin, et al., 2021). COLES evaluates the perception of tutor support, examining whether learners feel they receive timely feedback, clear guidance, and encouragement. Effective tutor support can take many forms or modalities such as, from answering questions and providing personalized feedback, even to moderating discussions and creating a welcoming and inclusive atmosphere in synchronous or asynchronous. A strong sense of tutor support can significantly impact learner motivation and engagement, particularly in the often-independent setting of online learning (Major, et al, 2021).

The learner's ability to make sense of the presented information and develop their own understanding pertains to interpretation. This aspect of the survey examines whether the learning activities and resources effectively facilitate comprehension and meaning-making. The following are essential for effective interpretation of a learner, clear communication, well-structured content, and opportunities for application (Maros, et al., 2021). This provides insights into how well the online

learning environment supports this process of knowledge construction and whether learners feel they can effectively understand and apply the course material.

COLES provides a comprehensive framework for evaluating the effectiveness of online learning environments through the lens of constructivism. By examining relevance, reflective thinking, interactivity, tutor support, peer support, and interpretation, COLES offers valuable data to inform instructional design and promote a richer, more engaging, and ultimately more effective online learning experience. Understanding learner perceptions in these key areas allows educators to create online environments that empower learners to actively construct their knowledge, collaborate with their peers, and achieve their full learning potential (Kim, et al., 2019; Wu, et al., 2022; De Las Armas, 2023).

The ability to provide actionable insights for educators and instructional designers is where the strength of the COLES framework. By systematically assessing learners' perceptions across different dimensions, academic institutions and instructional designers can identify certain areas for improvement, plan, design, and implement strategies to enhance the online learning experience of learners. A good example is utilization of information on interactivity, which can guide the development of different engaging activities and collaborative tools. Moreover, insights into tutor and peer supports can be utilized for designing a more effective communication and feedback mechanism, where it can be beneficial and helpful. Lastly, COLES allows a more data driven approach to the development of online learning environment where it is both pedagogically and responsive to the needs and preferences of learners, without compromising effective, meaningful and impactful delivery of education.

Strength and limitations of the study: The research article demonstrates several key strengths that contribute to its potential impact and value within the field of nursing education and online learning. (1) It addresses a current need, where it examines online learning nursing education, a vital area given the rise of digital learning. (2) the article uses solid foundation, where it is based on constructivism and the COLES framework, (3) the

article recognizes unique challenges in the online nursing education, (4) it employs a systematic approach to gathering student feedback, and allowing for a data-driven insights, and (5) it aims to improve online nursing education by understanding student experiences, with the potential to impact practice and curriculum.

The researcher acknowledges that this study has its limitations, such as the sample size being relatively small, and the findings may not be generalizable to all nursing programs and courses utilizing online modality. Additionally, the survey instrument, while validated, may not capture all aspects of the online learning experience. Additionally, the reliance on self-reported data introduces the possibility of subjective bias. While the COLES provides valuable insights, these limitations should be considered when applying the findings to specific learning contexts or generalizing about online learning effectiveness. Future research could explore the impact of different instructional strategies, such as problem-based learning, case-based learning, and simulation, on student learning outcomes in online Anatomy and Physiology courses. Additionally, longitudinal studies could be conducted to track student progress and retention over time.

Conclusion: The findings from the study indicate that the constructivist online learning environment implemented in this Anatomy and Physiology course was generally effective in fostering student engagement and learning. Student Nurses perceived the course content as relevant, the instructional strategies as effective, and the support provided by the instructors as helpful. However, there were areas where the online learning environment could be further improved, like interactivity and peer support. This suggests that there is a need to create more opportunities for students to interact with each other and with the course content. It is recommended that instructors incorporate more collaborative activities, such as group projects and online discussions, to further enhance the online learning experience. And more strategies such as virtual social events or peer mentoring programs to foster a sense of community and belonging among students could be implemented. Understanding learner perceptions in these key areas allows educators to create online environments that

empower learners to actively construct their knowledge, collaborate with their peers, and achieve their full learning potential.

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