

Perception of Undergraduate Pharmacy Students of Case-Based Learning as a Tool in Teaching Pharmacy Management Course

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ABSTRACT

Aim/Background: Case-Based Learning (CBL) has become a significant pedagogical approach in higher learning institutions, especially in disciplines that involve problem-solving and critical thinking. This research aims at identifying the perception that undergraduate pharmacy students have toward CBL in a pharmacy management course. **Materials and Methods:** In this descriptive research study, 69 fourth-year pharmacy students from a university in Saudi Arabia were chosen. The data was collected through a self-administered standardized questionnaire and the participants' demographic information, CBL perceptions and feedback were analysed. **Results:** The results indicated that 63.77% of students agreed that CBL helped instructors deliver material adequately. It was also observed that 77% of the students agreed that CBL enhanced materials' delivery; 55.7% said it enlightened them more; and 44.92% agreed it helped in preparation and reading beforehand. Thus, 92% of the respondents agreed that it enhanced preparation. All the parameters of active participation, engagement and interaction increased for most of the students; however, it was observed that there were some discrepancies in the level of understanding and interaction. **Conclusion:** The study reveals the possibility of adopting CBL in a pharmacy curriculum, though with recommendations for improvement to address variety in students' learning styles. Possible future strategies include educating the instructors and reducing the level of the case study's complexity to allow more students' participation and satisfaction.

Keywords: Case-Based Learning (CBL), Pharmacy Management Education, Undergraduate Pharmacy Students, Active Learning Strategies, Pedagogical Approaches in Pharmacy.

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INTRODUCTION

Case-Based Learning (CBL) has emerged as a dynamic and interactive pedagogical approach in higher education, offering a practical application of theoretical knowledge.^{1,2} In the context of pharmacy management, CBL engages undergraduate students in real-world scenarios, fostering critical thinking and problem-solving skills essential for their future professional practice. So, the students need to understand not only the theoretical concepts but also to receive certain practical experience in solving various tasks, as pharmaceutical practice is a very intense and diverse field. Hence, this research explores the perception of undergraduate pharmacy students on the effectiveness of CBL in enhancing their learning experience in the Pharmacy Management course.

Teaching and learning in most pharmacy management courses have predominantly relied on the conventional approach, which incorporates the transmission mode of teaching where the students are receivers only of knowledge through presentations and lectures.^{2,3} However, with recent approaches to teaching and learning, they have come to realise these approaches cannot gain the students' attention as well as promote their understanding deeply. It is becoming increasingly apparent that for students not only to grasp ideas learnt both in class and outside in real-world scenarios but also to be able to apply them, the teaching approach is increasingly turning to incorporate more teaching through real experience.

Within this process of educational change, Case-Based Learning (CBL) has appeared as a potential learning approach for pharmacy management education.³⁻⁵ Thus, CBL can open the doors for the students to give them a glimpse of the real-life situations that are so essential for the proper functioning of pharmacy management with the help of real references, making an excellent link between the theory and the practice. Contrary to the model where the memorisation of facts and their corresponding theories



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takes place, students are engaged in the processes of analysis and evaluation of the possible scenarios and coming up with the solutions for the situations that may occur in their future workplaces.^{4,6}

Case-based learning is a method of teaching and learning in which students are exposed to rich and realistic examples of situations they might experience at their workplaces.⁵ These cases form the basis of active learning, where students must engage in the topics through the activities of problem-solving, decision-making and applying theories learnt in class to real-world scenarios. This strategy enhances students' problem-solving ability and teamwork inculcates knowledge that makes this approach appropriate for fields, such as pharmacy, where the applied knowledge is key.³⁻⁶ However, this strategy entails certain advantages as well as disadvantages.

Case-Based Learning (CBL) improves pharmacy management education in various ways. First, it engages and motivates students by giving them real-world problems to solve.⁷ Problem-based learning makes learning more engaging and relevant, according to.⁸ CBL is one of the greatest teaching methods for information acquisition since it improves critical thinking and problem-solving. Comprehensive case studies teach students advocacy, which is essential to clinical decision-making. Students learn to critically evaluate evidence and develop practical solutions for a variety of healthcare concerns via such exercises.⁹

Moreover, another strength of CBL is that it ensures the continuity of learning through the integration of theory and practice. As highlighted by,¹⁰ this shift from formal curriculum to practice not only enhances the comprehension of the concepts taught but also the implementation of these concepts as a point of convergence between practice and theory. Moreover, through the integration of CBL using collaborative group work, interpersonal communications are also promoted by way of discussing, cooperating and compromising. This is similar to the collaboration they will experience in healthcare organisations, where they will come across interactions with physicians, nurses, pharmacists and other multidisciplinary professionals, as highlighted by.⁴

However, it is important to mention that there are some problems associated with the implementation of Case-Based Learning (CBL) in pharmacy education. It is cumbersome, as well as requiring much time and resources from the instructors, not only in the preparation and crafting of impressive cases but also in the actual delivery. Moreover, when students attend college with different preparations, they create the need for skilled tutors and when assessment is done, it poses some of the reasons that slow the implementation of CBL in the curriculum.¹¹

In addition, it is quite time-consuming for those instructors who have to prepare and moderate the case discussions.¹² also noted that developing high-quality cases takes a lot of resources and

time. This sometimes makes it easier for students to be ready for the class; on the other hand, some students may be too stiff to embrace the active learning format.¹³ stated that the technical skill of the trainers to facilitate CBL is also a significant challenge since teaching ability is essential for the facilitation of competencies. Finally, the issue of evaluating learner performance in CBL is challenging, especially from an individual and group perspective and is therefore one of the most difficult facets of indeed using this form of education.

This study greatly advances pharmacy education literature and informs educators, curriculum designers and policymakers.¹⁴ Understanding undergraduate pharmacy students' impressions of CBL material helps identify its advantages and areas for improvement. This study improves teaching methodologies, curricular material and general teaching methods in pharmacy management courses. The outcomes from this research may help decrease CBL application gaps and solve pharmacy management learning problems. Additionally, it builds on prior research to improve teaching and learning in this ever-changing field, embracing changes for advancement in education.^{10,15,16} This places the research in the perspective of current education trends and emphasises its relevance to academic and practical experience.

This study examines undergraduate pharmacy students' views on Case-Based Learning (CBL) in pharmacy management courses. More specifically, it seeks to understand how students interact with instructors during CBL, how CBL affects their learning experience and the challenges of incorporating CBL into pharmacy management courses. Although this strategy is comprehensive, a better grasp of the implications and difficulties ahead of the CBL will improve educational initiatives in this area.

MATERIALS AND METHODS

Study Design and Population

This research utilized a descriptive research design to evaluate the effectiveness of Case-Based Learning (CBL) in the teaching of the "Principles of Pharmacy Management and Marketing" at a university in Saudi Arabia from May to June 2024. The population consisted of undergraduate pharmacy students in their fourth year of their Doctor of Pharmacy program in Pharmacy College. All students were enrolled in the "Principles of Pharmacy Management and Marketing" course. Informed consent was obtained online from each student after a thorough explanation of the study. The questionnaire responses were gathered utilizing an online platform (Google Forms). In this assessment, both quantitative and qualitative data collection techniques were employed for each part of the study.

Sampling Technique

The convenience sampling method was used and the participants of the study comprised fourth-year pharmacy students of

a university in Saudi Arabia. This approach was practical considering the current comparability of the target population and the limitations of the study conducted. A total of 69 students participated with a response rate of 100% and a robust cross-sectional sample of the Student population was obtained as per research protocol.

Data Collection

The data collection for the purpose of this study was completed through an online survey conducted through Google Forms. This method was chosen due to its effectiveness where and when the participants can conveniently and voluntarily fill out the survey. The data were collected using a standardized pre-tested questionnaire. To ensure the questionnaire's reliability, content accuracy and internal validity, the principal researcher formulated the questions in consultation with the available literature and advice from experts in the field to verify that the readability, order and clarity of the questions meet the required standards.^{17,18}

The questionnaire involved three sections: demographic information, perception of CBL and feedback on CBL. The first section gathered respondents' demographics, such as age, marital status, academic Grade Point Average (GPA), living arrangements and family members with managerial positions. The second section tested the students' perception of CBL's ability to increase interest, participation and comprehension of managerial concepts. Lastly, the feedback part incorporated descriptive questions that enabled students to explain how effective CBL is, the areas that need improvement and their recommendations. The five-point Likert scale, which ranges from 5 as "strongly agree" to 1 as "strongly disagree", was utilized to report the students' responses.

Ethical Concerns

The data was collected over two months in the second semester of the course. The participants were asked to complete a self-administered survey and these completed forms were collected by the researchers after completing the study. Additionally, the researcher ensured that online written consent was obtained from all the participants. This study required no coercion and the data collected was/ remained anonymous and confidential to the participants. As for the privacy of the participants, potential identifiers were masked and edited during the data preparation phase. The research conformed to the national standards for the use of human subjects and was considered to be low-risk for the participants and, therefore, exempted from the University's Institutional Review Board (IRB).

Data Analysis

Excel software has been used to analyze the data statistically. Other than frequency distributions and percentages for categorical variables and mean and SD for continuous variables, the data gathered was analyzed and interpreted. This approach was helpful in appreciating the perception and feedback given by the students on the use of CBL in teaching and learning the pharmacy management course. The overall method used in the study made it possible to establish a dependable conclusion that was in line with the experiences of the participants.

RESULTS

The socio-demographic data of the 69 participants in the study reveal several key characteristics as shown in Table 1. The majority of the participants are over 20 years old (89.85%), with only a small fraction under 20 years old (10.15%). Academic performance, measured by GPA, shows that nearly half of the

Table 1: Socio-demographic data of respondents.

Variable	N=69	%	
Age	>20 years old	62	89.85
	<20 years old	7	10.15
GPA	4.5-5	34	49.3
	4-4.49	25	36.2
	3.5-3.99	10	14.5
	>3.49	0	0
Current Marital status	Single	68	98.6
	Married	1	1.4
	Divorced	0	0
	Widow	0	0
Living situation	Living with family	67	97.1
	Living alone	2	2.9
Family members in a managerial position	Yes	43	62.3
	No	26	37.7

students (49.3%) have a GPA between 4.5 and 5, while 36.2% have a GPA between 4 and 4.49 and 14.5% fall within the 3.5 to 3.99 range. All participants have a GPA above 3.49. In terms of marital status, almost all participants are single (98.6%), with only one married student (1.4%). The living situation of the participants indicates that a vast majority live with their family (97.1%), while a small number live alone (2.9%). Additionally, a significant portion of the participants (62.3%) have family members in managerial positions, whereas 37.7% do not.

Figure 1 illustrates the perceptions of undergraduate pharmacy students regarding the effectiveness of Case-Based Learning (CBL) in three areas: delivery of material by the instructor, increase in knowledge of the material and preparation and reading of the material beforehand. A significant majority (63.77%) agree that CBL helps instructors deliver the material adequately, while 24.63% remain neutral and 11.59% disagree. In terms of increasing knowledge, 55.07% of students agree that CBL is beneficial, 18.84% are neutral and 26.08% disagree. When it comes to preparation and reading of the material beforehand, 44.92% agree that CBL helps, 34.78% are neutral and 20.28% disagree. Overall, the data indicate that while a majority of students see positive impacts of CBL, there is a notable portion of students who are either neutral or disagree, especially in the context of increasing knowledge and preparation.

Figure 2 showcases the students' perceptions of the impact of Case-Based Learning (CBL) on various aspects of their learning experience, including active participation, engagement, interaction and understanding. A substantial majority (60.87%) agree that CBL increases active participation, with 24.63% neutral and 14.49% disagreeing. When it comes to increased engagement, 65.22% of students agree, 20.29% are neutral and 14.49% disagree. In terms of improved interaction, 56.52% of students agree, while 21.74% are neutral and 21.74% disagree.

Lastly, regarding improved understanding, 49.28% of students agree, 26.08% are neutral and 24.63% disagree. These results indicate that while a significant number of students perceive CBL positively across these metrics, there remains a considerable proportion who are either neutral or disagree with its benefits, particularly in improving understanding and interaction.

Figure 3 provides insights into students' recommendations for future use of Case-Based Learning (CBL), their level of satisfaction and their perception of CBL as a fun experience. More than half of the students (53.62%) recommend using CBL in the future, while 20.28% remain neutral and 26.08% disagree. As for the level of satisfaction, 56.52% of students show overall satisfaction, 24.63% are neutral and 18.84% are dissatisfied. In regards to levels of perception towards CBL as entertainment, the medium scored 50.72% agree, 21.74% are neutral towards the advertisements enabling the government to reach more of its target and 27.54% disagree. These results suggested that students, overall, do not have a negative attitude towards CBL and even somewhat recommend future use and are somewhat satisfied; however, a significant number of participants are neutral, disagree or are even unwilling to report their enjoyment levels.

DISCUSSION

The purpose of the research was to understand the effectiveness of CBL in the context of the reactions and experiences demonstrated by undergraduate pharmacy students in the teaching of the courses under the management of pharmacy. The findings of this research offered valuable information concerning the efficiency and acceptance of Case-Based Learning (CBL) techniques among fourth-year pharmacy students. In general, it is important to offer a better understanding of how socio-demographic factors affected the research and the way the participants were influenced by CBL. Sociodemographic factors, for example, family and

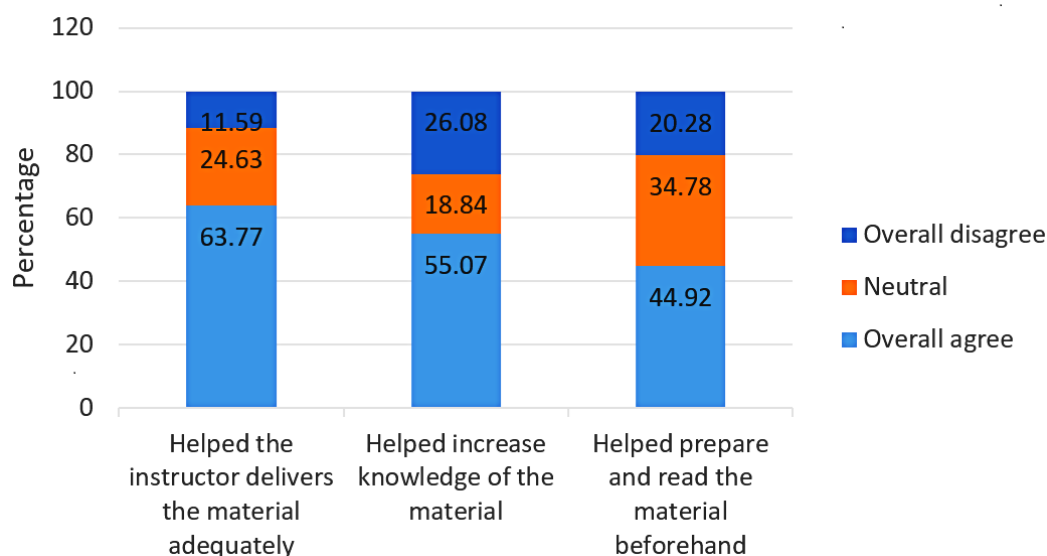


Figure 1: Perceptions of undergraduate pharmacy students regarding the effectiveness of CBL.

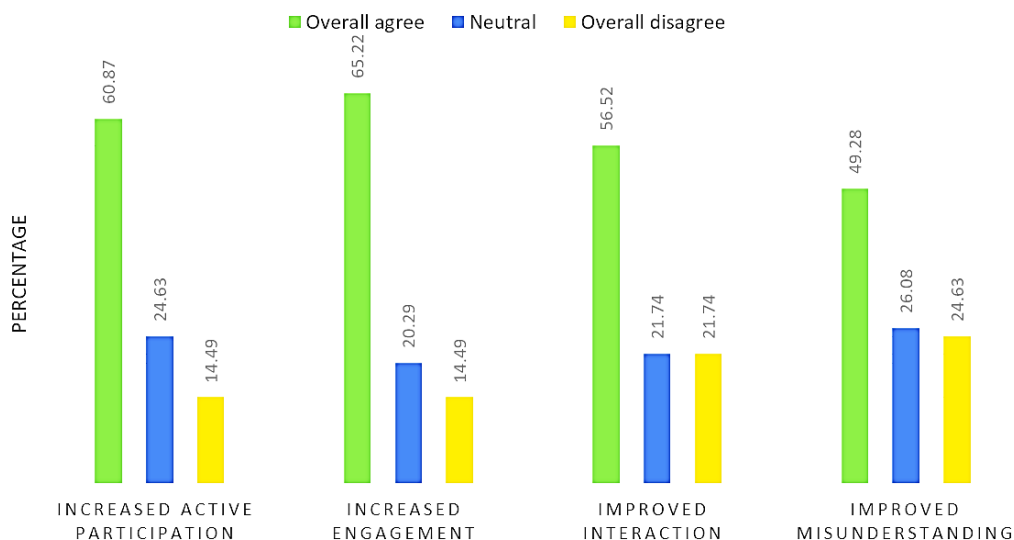


Figure 2: Students' perceptions of the impact of CBL on various aspects of their learning experience.

academic performance, were found to influence students' perceptions towards CBL. For example, learners who have relatives who are managers may have had different expectations or attitudes toward management education, as pointed out by¹⁰ that socio-economic factors can affect education. As such, the current study supports this view, postulating that such socio-demographic factors are relevant for understanding the student's response. Besides, even with the small sample number, the positive attitudes toward CBL have been observed and can be justified by other studies. Research by⁷ and⁹ show that CBL fosters students' interest and deep thinking, which agrees with the findings of this investigation. The sample size is restricted, therefore lowering the generalisation factor; nonetheless, the data gathered from the students' feedback and the increasing trends from the different variables support the study outcomes. Thus, by putting the socio-demographic characteristics into the contextual perspective and referring to the relevant theoretical concepts, the findings of the study regarding CBL's efficiency appear to be more justified to silence the critics and discuss the impact and applicability of the intervention.

The findings of this research also offered valuable information concerning the efficiency and acceptance of Case-Based Learning (CBL) techniques among fourth-year pharmacy students. The outcomes revealed that the majority of students have a positive attitude towards CBL (63%). 77% of the respondents with a view that it facilitates instructors teaching appropriately, 55.7% understand its advantages in enhancing the amount of knowledge and 44.92% of the respondents admit that it was useful in preparing and reading before the actual sessions. The presented results corroborate the idea of,⁶ who identified the positive influence of CBL on problem-solving skills and motivation to learn in a group of nursing students. Nevertheless, the level of agreement was somewhat low; more students were

undecided or disagreed with the survey statements, especially in relation to the enhancement of knowledge and readiness. This made the authors imply that, though CBL is normally beneficial, the way it is being done to benefit these students may still need some enhancement so as to accommodate more of the varying students with different learning capabilities.¹ Used a quantitative study to uncover students' perceptions and expectations of their education in a developing country and the author perceived that students want more practices and interactions in the educational process. The current study echoes this sentiment, with 60.87% of students agreeing that CBL increases active participation and 65.22% noting enhanced engagement. These results suggested that CBL could be a valuable tool in meeting students' desires for a more dynamic educational experience. However, the study also highlighted challenges, as 21.74% of students were neutral and another 21.74% disagreed about improved interaction, pointing to the need for more consistent and effective implementation strategies.⁷ Discussed the importance of pedagogical strategies in addressing complex challenges such as climate change through One Health Education. While the context differed, the underlying principle of employing innovative teaching methods to foster deeper understanding and engagement is relevant. The current study's findings that nearly half of the students feel that CBL improves understanding (49.28%) and interaction (56.52%) supported the notion that active learning strategies like CBL can enhance educational outcomes. Nonetheless, the mixed responses regarding understanding and interaction suggested that further research is needed to optimise these methods for all students.¹⁶ Emphasised the role of school effectiveness and management in educational development. The present study sheds light on the socio-demographic factors influencing students' perceptions of CBL, such as family background and living situation. A significant portion of participants (62.3%) have family members in managerial positions, which might

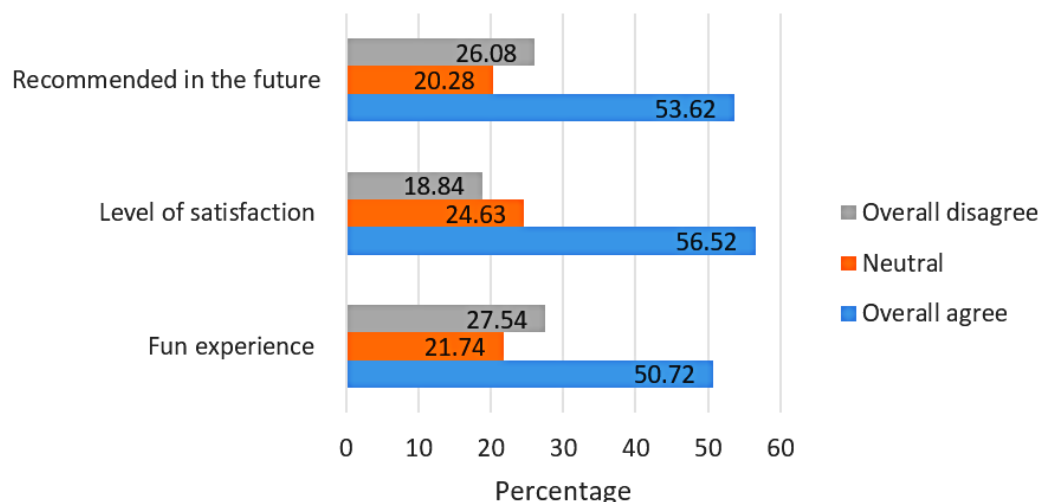


Figure 3: Students' feedback into the CBL.

influenced their views on management education and active learning approaches. This aspect underscored the importance of considering socio-demographic contexts when implementing and assessing educational innovations.

The significance of this study lied in its contribution to understanding the nuanced perceptions of pharmacy students towards CBL in teaching pharmacy management. By highlighting both the positive impacts and the areas needing improvement, the study provides a comprehensive view that can inform future pedagogical strategies. The findings suggested that while CBL is generally well-received, its effectiveness can be enhanced by addressing the specific concerns of students who remain neutral or disagree about its benefits. Moreover, the study's socio-demographic insights emphasise the need for a tailored approach in educational planning and implementation.

STRENGTHS AND LIMITATIONS

Strengths

The study offered an evaluation of Students' perception towards CBL in the management courses of pharmacy and is the first study done in Saudi Arabia. Selecting CBL as the teaching method resulted in various benefits and difficulties; this study provides insights into the extent of their applicability and adaption.

Limitations

Our main areas of weakness comprise a limited sample size sampling, which may not well represent all students and response bias since students with stronger feelings about CBL were more inclined towards the survey.

CONCLUSION

In conclusion, this study highlights the substantial yet complicated impact of CBL on undergraduate pharmacy students' pharmacy management course experiences. The data indicate that university

students see CBL as beneficial to student engagement, efficacy and theoretical knowledge application. Most agreed that CBL may improve teaching and idea understanding. However, the conflicting emotions about knowledge growth and preparedness show that CBL is useful yet needs improvement to meet students' demands.

The results showed that students' familial and academic backgrounds affected their CBL impression. Given these principles, these two difficulties demonstrate the importance of considering such aspects in educational intervention design and execution. Due to the small number of participants and student opinion variance, further study is needed to replicate these findings and assess CBL's usefulness.

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CONFLICT OF INTEREST

I declare no potential conflicts of interest regarding the research, authorship and/or publication of this article. The study was conducted independently and I have no financial or non-financial interests that could inappropriately influence the work.

ABBREVIATIONS

CBL: Case-Based Learning; **GPA:** Grade Point Average; **N:** Number of Students.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The Institutional Review Board of Princess Nourah bint Abdulrahman University, Riyadh, Saudi Arabia, approved and exempted this study (Ref. No. 24-0718). We obtained informed consent from the university students who agreed to participate in the online survey, as participation was voluntary and no identifiable information was obtained.

RECOMMENDATIONS

Enhance CBL Implementation

This CBL approach should be further enhanced by adding a number of resources and forms of support specifically for the instructors and the students. It could be professional development of the educators and additional resources that can help learners prepare for and participate in case-based activities.

Increase Student Feedback Mechanisms

More so, it is necessary to encourage students to make their feedback known so that perceptions and personal experiences about CBL could be received on a periodic basis. This will ensure that improvements are made to the CBL approach and also ensure that specific difficulties, such as those faced by students, are met head-on.

Consider Socio-Demographic Factors

Adopt the CBL approaches in consideration of socio-demographic characteristics for learning, such as family and performance milieu. Adaptation of the approach can be useful in provisioning for the diverse needs of the learners and improving on the impacts of learning.

EXPAND RESEARCH SAMPLE

Plan secondary research whereby a much larger population of students should be sampled for the purpose of establishing the general probability that students would benefit from the CBL.

INTEGRATE EVALUATION TOOLS

Form and use a sound set of instruments for evaluating CBL effectiveness with reference to multiple learning outcomes systematically. This will help encourage the assessment of its

success and timely modification of the educational delivery method.

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