

Knowledge, Obstacles and Options for Implementing Active Learning: A Descriptive Cross-sectional Study from a Medical College in Central Nepal

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ABSTRACT

Introduction: Education is a dynamic process that needs periodic refining. Lack of innovative teaching techniques in academics make medical education inadequate in making a significant stride towards the future. Didactic lectures (DL) have been the gold standard and the most common method of traditional teaching and learning practice. Active learning improves knowledge-sharing process facilitate development of analytical approaches to a problem solving and develops critical thinking. The aim of this study is to evaluate the knowledge, obstacles and options implementing active learning for among current teaching faculties of different affiliation.

Methods: A descriptive, cross-sectional study was conducted on August 2022 among seventy-eight study participants. They were instructed to fill in the preformed proforma after obtaining written consent. Statistical analysis done using SPSS.

Results: Fifty-two (66.7 percent) of participants strongly favored that active learning imparts better content knowledge, with forty-six (59 percent) of participants strongly agreeing that lack of insufficient student-teacher interaction is obstacle for active learning. Forty-four (56.4 percent) participants strongly agreed that group work facilitates active learning.

Conclusion: Active learning methods can be implemented in the medical curriculum as medical educators are aware of the challenges and obstacles of this teaching learning method. It can develop lifelong learning skills among the students and teachers.

Keyword: Active learning; Didactic learning; Medical education.

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INTRODUCTION

Education is a dynamic process that needs periodic refining. Lack of innovative teaching techniques in academics makes medical education inadequate in achieving a significant stride towards the future. Didactic lectures (DL) have been the gold standard and the most common method of traditional teaching and learning practice.¹

DL is typically conducted in an instructor - centered classroom, centralizing the knowledge and, content, with large amounts of information delivered in spite of minimal student engagement². A shift from solely didactic lectures towards active learning (AL) methods, together with evidence-based research and personal experiences is essential for effective learning. It has proved to make learning more enjoyable, easier and comprehensive. AL methods improves knowledge-

sharing process facilitate development of analytical approaches to a problem solving and develops critical thinking.³ The aims of this study are to evaluate the knowledge, obstacles and options implementing active learning among teaching faculties of different affiliation.

MATERIALS AND METHODS

A descriptive, cross-sectional study was conducted among all seventy-eight faculties working at Chitwan Medical College on August 2022. The study participants included all academics from School of Medicine, School of Dental Surgery, School of Pharmacy, School of Public Health and School of Nursing irrespective of gender and age. All faculties were included in the study after obtaining the informed written consent. Prior approval of Institutional Review Committee was taken before commencement of study (CMC-IRC /079/080-006). The data collection tool constituted two parts: participants' demographic information, and fifteen structured questionnaires (five each on knowledge, obstacle and options regarding implementing active learning) obtained from previously published studies. A pilot study was conducted among twelve academics before data collection process. The data collection tool was distributed to all the participants and response was collected within half an hour of administration in respective schools. Study participants were instructed to mark their response on a 5-point Likert scale. (Strongly Agree 1, Agree 2, neither agree nor disagree 3, Disagree 4, Strongly Disagree 5).

The data was entered and analyzed using IBM SPSS statistics 17.0. Frequency and percentage were calculated. Cronbach α was used to assess the internal consistency of the questionnaire. Among seventy-eight participants of this study, fifty-two (66.7 percent) of participants strongly favored that active learning imparts better content knowledge, with forty-six (59 percent) of participants strongly agreeing that lack of

insufficient student-teacher interaction is obstacle for active learning. Forty-four (56.4 percent) participants strongly agreed that group work facilitates active learning. (Table 2)

RESULTS

The study included a total of seventy-eight participants of which thirty (38.5 percent) were males and forty-eight (61.5percent) were females. The maximum number of study participants were from school of medicine (34.6 percent) with the least from school of pharmacy (nine percent) (Table 1)

Table 1: Background Profile of Study Participants

Gender	Frequency (%)
Male	30(38.5)
Female	48(61.5)
Affiliation	
School of Medicine	27(34.6)
School of Dental Surgery	13(16.7)
School of Nursing	21(26.9)
School of Public Health	10(12.8)
School of Pharmacy	7(9.0)
Qualifications	
PHD	11(14.1)
Masters	67(85.9)
Designation	
Professor	6(7.7)
Associate professor	27(34.6)
Assistant professor	20(25.6)
Lecturer	25(32.1)
Experiences	
Less than 5 years	24(38)
5 -10 years	41(52.6)
More than 10 years	13(16.7)

Table 2: Knowledge, Obstacles and Options regarding Active learning

SN	Statement	Response count n (%)				
		1	2	3	4	5
Knowledge of Active Learning Cronbach's alpha: 0.889						
1	Active learning imparts better content of knowledge of the topic	52(66.7)	20(25.6)	0	3(3.8)	3(3.8)
2	Active learning improves the retention of knowledge	49(62.8)	22(28.2)	0	1(1.3)	6(7.6)
3	Active learning improves academic performance of students	44(56.4)	25(32.1)	3(3.8)	3(3.8)	3(3.8)
4	Active Learning makes the topic more interesting and fun to learn.	52(66.7)	12(15.4)	8(10.3)	3(3.8)	3(3.8)
5	Active learning promotes to explore different resource materials	44(56.4)	19(24.4)	8(10.3)	7(9.0)	0
Obstacles of Active Learning Cronbach's alpha 0.760						
1	Lack of insufficient student-teacher interaction is obstacle for active learning	46(59)	11(14.1)	8(10.3)	9(11.5)	4(5.1)
2	Lack of experiences /teachers training is obstacle for active learning	28(32.1)	32(41.0)	9(11.5)	9(11.5)	3(3.8)
3	Lack of student's interest is obstacle for active learning	37(47.4)	25(32.1)	6(7.7)	3(3.8)	7(3.8)
4	Time management is obstacle for active learning	23(29.5)	29(37.2)	16(20.5)	4(5.1)	6(7.7)
5	Lack of communication skill is obstacle for active learning	36(46.2)	22(28.2)	4(5.1)	8(10.3)	8(10.3)
Options for Implementation of Active Learning Cronbach's alpha: 0.898						
1	Group work facilitates active learning	44(56.4)	19(24.4)	8(10.3)	1(1.3)	6(7.7)
2	Role play promotes student engagement during lectures	37(47.4)	26(33.3)	5(6.4)	4(5.1)	6(7.7)
3	Videos promote active learning during lectures	37(47.4)	27(34.6)	6(7.7)	5(6.4)	3(3.8)
4	Discussion promotes active learning during lectures	47(60.3)	21(26.9)	4(5.1)	6(7.7)	0
5	Clarification pauses foster active listening during lectures	28(35.9)	28(35.9)	12(15.4)	2(2.6)	8(10.3)

Note: 1: Strongly Agree, 2: Agree, 3: neither agree nor disagree, 4: Disagree, 5: Strongly Disagree.

DISCUSSIONS

Active learning describes pedagogical methods that provide students with opportunities to actively engage, process, and apply information they have been taught. Active learning is based on the constructivist learning theory—new knowledge is built from prior knowledge—proposed by Jean Piaget.⁴

Traditionally, Didactic learning (DL) occupy the center of education in pre-clinical years. DL have been the formal method of relaying information from

instructor to student. However, this approach has been met with numerous challenges necessitating the implementation of modern learning techniques. DL is passive and poorly designed or executed. On the other hand, AL enables students to be more interactive and enhance their learning through collaboration. Students are becoming increasingly interested to engage in teaching and learning beyond the domain of the classroom.⁵ AL is more effective in improving knowledge and understanding in medical education

compared to didactic lectures, and has shown to improve long-term retention of knowledge and self-directed learning skills.⁶

In the present study fifty-two percent participants were in favor of active learning that it imparts better content of knowledge of the topic and also makes the topic more interesting and fun to learn. In the context of obstacles implementing during active learning reveals that lack of insufficient student-teacher interaction is obstacle for active learning (59%). 56.4 % participants opinioned that group work facilitates active learning. Imanieh MH et al reported active learning to significantly increase learning and recalling output compared to the traditional method (didactic learning) The study participants in the present study also had a similar opinion.⁷

Burgess A et al, reported active learning (Peer assisted learning) improved learning benefits in both tutors and tutees consistent with the present study.⁸ Paul R et al reported that most instructors in higher education believe active learning promotes critical thinking similar to the findings of the present study.⁹ Transforming medical pedagogy is necessary step for improving learning environments in medical educations. Pedagogical transformation for medical faculty may be difficult due to no prior pedagogical training. Strategies for engendering a more active learning are accessible and applicable to existing content modules. Lectures (passive learning) can be adapted into active learning engagement with no loss of content material. Active learning involves both the instructor and students working cooperatively. Active learning pedagogies engages the learner so that knowledge gain and recall are increased.¹⁰

Larry Hurtubise concluded from his study that an integral part of curriculum change is the flipped classroom. The transition to a competency-based paradigm in healthcare education is being made easier by technological advancements that permit asynchronous and remote learning. Flipping the classroom, at its most basic, is the practice of giving students didactic material—typically covered in lectures—to be studied in advance and utilizing in-person time for more engaging and active learning techniques. New opportunities for learning throughout the continuum of medical education as well as interprofessional education are being created by the

development of increasingly complex learning systems.¹¹

The article published by Arruda H et.al proposed the Engineering Education Active Learning Maturity Model (E2ALM2), a framework that allows practitioners to assess the current maturity of Active Learning implementation in a program or a course. E2ALM2 was built from a literature review of key success factors (KSF) for Active Learning implementations, which were divided into dimensions. Each KSF is composed of constructs, which are detailed with variables. Each variable has a proposed measurement method and an estimated uncertainty level. The framework can support diagnosis and practical improvements in real settings.¹²

This report published by Radloff A et al. provides an in-depth exploration of the differences in students' engagement for students in various equity groups – students from low socioeconomic backgrounds, those who are the first-in family to attend university, and Indigenous students among others. The findings generally affirm that students from low socioeconomic backgrounds, from regional and remote areas, and who identify as being of Indigenous origin or descent perform educationally at comparable levels to others. The findings of this study are similar with present study due faculties being exposed to active learning methods of teaching from time and again.¹³

This instructional article based on study conducted by Wanner Thomas is about an innovative teaching approach for enhancing student engagement and active learning in higher education through a combination of just-in-time teaching and the use of PowerPoint technology. The central component of this approach was students' pre-lecture preparation of a short PowerPoint presentation in which they answered a few general conceptual questions about the coming lecture topic. The power of PowerPoint, it is argued, is about structuring student thought and student engagement before and during lectures, as well as giving students more power to be involved to shape content and interactivity of university lectures. The article concludes with some valuable lessons and pointers for course instructors across disciplines about the pedagogy and use of PowerPoint as an instructional method for enhancing student engagement and active learning.¹⁴

This article based on study conducted by Aksit F examines the effectiveness of the recent reforms in Turkey from a student's perspective, and provides an understanding of the concept of active learning, how it is applied and what the obstacles are to achieving it. The data were collected through open-ended questions on an electronic platform. Student teachers (n = 316) in the Faculty of Education at Erciyes University responded to the questions. The data were analysed qualitatively through content analysis. The results clearly indicated a big gap between the formal and applied curricula in the Faculty of Education. Many indicators of active learning can be observed, but there are still many obstacles to be overcome.¹⁵

Xiangyun DU et al. concluded in an explanatory mixed methods research design was including a survey completed by 308 participants and group interviews involving 38 participants their study that the prevalence and preference for passive mode of instruction among student teachers as convenient approach that would guarantee good grades from assessment procedures favoring memorization. The results of this research are contrary to present research due the variation in research methodology and variation in academic status of the participants.¹⁶

Hannele Niemi reported from his study that schools and teacher education departments are in the middle of a cultural change. In both institutions, many indicators of active learning and other revisions of the learning culture can be seen, but active learning methods are implemented by only a few teachers, and mainly with fairly closed tasks. Open learning environments, which require students' own initiative, planning, experimentation, elaboration and self-evaluation, still seem to be rare. The finding of the study is in close proximity with present study.¹⁷

A Teshome showed from his study performed among 123 teachers that among the major factors affecting the effective implementation of active learning were instructors' tendency toward the traditional/lecture method, lack of students' interest, shortage of time, lack of instructional material and large class size. The findings of present study are far better due to exposure to various modern teaching methods among the participants involved.¹⁸

Daouk Z et.al performed a study on students' and instructors showed main findings indicate that the majority of the learners as well as the instructors

favoured active learning and are strong proponents of putting into effect this approach in all their courses. These findings indicate the positive perceptions towards active learning strategies and the possible impact that these perceptions have on students' performance and learning.¹⁹

The findings reported by Kimonen E et.al in this article form part of a wider comparative research project investigating the active learning of teachers and of pupils in the educational practices of eight countries. On the basis of the data, the transformative learning process of teacher in the changing school culture is presented.²⁰

This study by Hartikainen S et.al clarifies the current use the concept of active learning in engineering higher education by focusing on the definitions of the concept itself and on the arguments for applying it. According to the results, active learning was defined in 66 articles in three major ways: (1) Active learning defined as an instructional approach, (2) active learning not defined but viewed as an instructional approach, and (3) active learning not defined but viewed as a learning approach.²¹

The study by Lise McCoy et.al reflects learning-centered culture, focused on the scholarship of teaching and learning. In the current phase, it appears that there is a promising level of saturation of active learning within large group sessions (74%). The frequency and variety of active learning components integrated across the 9 courses reflected faculty fluency with a range of techniques and their support of an active learning culture. Of 646 hours of large group instruction, 476 (74%) involved at least 1 active learning component.²²

Responses from 146 SACME members in 91 CME units yielded a ~42% survey response rate. Many respondents reported their self-perceived knowledge of AL as high. Advanced training (e.g., certificate, Master of Education degree) was positively correlated with AL knowledge. AL methods were reportedly used in half of the CME activities in the majority (80%) of institutions. Higher levels of self-perceived knowledge were correlated with an increased percentage of AL-related CME activities. Commonly perceived barriers to use of AL were presenters' lack of familiarity and a need for more time-consuming preparation.²³

Interview transcripts revealed candid responses to questions about learning and the learning environment. The semi-structured nature of the interviews enabled the interviewers to probe unanticipated issues (e.g., reasons for choosing to sit with friends although that diminishes learning and attention). A content analysis of these transcripts ultimately identified three major themes embracing multiple sub-themes: (i) learning studio physical space; (ii) interaction patterns among learners, and (iii) the quality of and engagement in learning in the space.²⁴

Buckling BA concluded from the study that Prior to each session, right after it ended, and one month later, we evaluated the residents' knowledge of and attitudes regarding the session's subject matter. Following each session, we evaluated the residents' impressions of the session's value and level of engagement. During each session, we used blindfolded observers to observe the activities of the residents using a standardized instrument. The residents' knowledge and attitude scores improved as a result of both instructional strategies. The degree of improvement did not differ statistically between groups. Residents in the active learning session felt more involved with the session's material and one another than residents in the didactic session, and this perception was supported by observations. Compared to residents in the active session, those in the didactic session thought that the session had a larger educational value.²⁵

Students perceived that lecture and passive pedagogies were more effective for learning, whereas faculty felt active and collaborative learning was more effective. Students believed that more content should be covered by lecture than faculty. There were also significant differences in perceptions of what makes a good teacher. Students and faculty both felt that lack of time in the curriculum and preparation time were barriers for faculty. The data suggest that students are not familiar with the process of learning and that more

time may be needed to help students develop lifelong learning skills.²⁶

Desselle BC performed a study on Faculty teaching in a pediatrics residency participated in a 1-hour workshop (intervention) approximately 1 month before a scheduled lecture. Participants' responses to a preworkshop/postworkshop questionnaire targeted self-efficacy (confidence) for facilitating active learning and thinking and providing feedback about workshop quality. Trained observers assessed each lecture (3-month baseline phase and 3-month intervention phase) using an 8-item scale for use of active learning strategies and a 7-item scale for residents' engagement in active learning. Observers also assessed lecturer-resident interactions and the extent to which residents were asked to justify their answers. Responses to the workshop questionnaire (n=32/34; 94%) demonstrated effectiveness and increased confidence. Faculty in the intervention phase demonstrated increased use of interactive teaching strategies for 6 items, with 5 reaching statistical significance ($P \leq .01$). Residents' active learning behaviors in lectures were higher in the intervention arm for all 7 items, with 5 reaching statistical significance. Faculty in the intervention group demonstrated increased use of higher-order questioning ($P = .02$) and solicited justifications for answers ($P = .01$).²⁷

CONCLUSION

The findings of current study were consistent with previous studies. Active learning methods can be implemented in the medical curriculum as medical educators are aware of the challenges and obstacles of this teaching learning method. It can develop lifelong learning skills among the students and teachers.

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