

Impact of the Certificate in Health Professions Education (CHPE) on Faculty Knowledge and Teaching Practices in Allied Health Sciences

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Background: Faculty development is critical to improving teaching quality in Health Professions Education, yet most institutions lack a structured and customized program for Allied Health Sciences faculty.

Objective: To address this gap by evaluating the impact of a Certificate in Health Professions Education (CHPE) course on Allied Health Science faculty's knowledge and teaching practices at Indus University of Health Sciences.

Methodology: The study involved the enrollment of faculty members in the CHPE course and utilized two data collection tools. The first was a questionnaire designed to assess participants' perceptions of their teaching practices before and after the course. The questionnaire demonstrated high internal consistency, with a reliability score of 0.997. The second data source consisted of participants' pre- and post-test scores from multiple-choice question (MCQ) assessments conducted in each module. Quantitative variables were summarized using either the mean \pm standard deviation (SD) or median with interquartile range (IQR), depending on the data distribution.

Results: Significant improvements in participants' knowledge were observed across all four modules. In Module 1, median scores increased from 5 to 10, indicating a 100% improvement. For several perception items, nearly 50% of participants shifted from agreement to uncertainty, suggesting increased self-reflection on their teaching practices. Gender-based analysis using median scores and interquartile ranges showed that while male participants initially outperformed females in Modules 1 and 2, female participants demonstrated greater post-course improvements. Notable decreases were observed in interactive lectures (100% to 72.22%), case-based learning (52% to 44%), flipped classroom (52% to 39%), and online teaching (89% to 68%). A similar downward trend was seen in assessment-related competencies, including item development (21% to 6%) and OSCE/OSPE station development (73.68% to 66.66%).

Conclusion: These findings underscore the transformative potential of targeted faculty development programs in allied health education, suggesting that despite a modest sample size, such interventions can catalyze substantial pedagogical change. This study is limited by the small sample size and self-reported data; thus follow-up research with a larger sample size, reflections, feedback, and narrative inquiry is recommended.

Keywords: Faculty development, health professions education, allied health faculty

ABSTRACT

Introduction

The field of medical education is changing quickly due to developments in technology, pedagogy, and healthcare delivery strategies.¹ To satisfy the changing demands of students and the healthcare system, faculty personnel must remain up-to-date on these developments and employ modern teaching and assessment techniques.²

Faculty development programs are designed to train teachers to improve the performance of academic staff.³ The training sessions are tailored to the specific needs of each educational institution and focus on developing individual faculty members' knowledge and skills in areas such as teaching, administration, assessment design and implementation, research, and clinical

practice.⁴ These skills are crucial for advancing educational development.⁵ Higher Education Commission (HEC) of Pakistan, which is the accrediting body of our university's programs also mandates faculty training as an essential component of quality control and continuous improvement.⁶

With the expansion of postgraduate medical education programs, Indus University of Health Sciences has seen remarkable growth. Moreover, close contact of educationists with the students of the Allied health colleges in the clinical settings has revealed that they have unique and specific educational needs which have emphasized the need to improve faculty competencies in teaching and assessment strategies and to acquaint them with modern teaching tools.⁷ To fill these gaps health profession education department at our university started a 6-month certification course in Health Professions Education (CHPE) course in year 2023. The course consisted of five modules. The first four modules focused on teaching, assessment, and online teaching tools, while the final module addressed topics specific to Allied Health education, such as skills lab and clinical rotation teaching.⁸ The current study aimed to evaluate the impact of this course on the knowledge and perception of the participants' teaching practices.

Materials and Methods

This study was conducted using a quasi-experimental design at the Indus University of Health Sciences – Indus Hospital and Health Network (IUHS-IHHN) after obtaining IRB approval (IHHN_IRB_2023_05_032). The study was carried out over six months between August 2023- Feb 2024. Participants were selected through purposive sampling, focusing on individuals enrolled in the 2023 session of the Certificate in Health Professions Education (CHPE) course. Those who did not provide consent to participate were excluded from the study. Verbal consent was taken from the participants before enrollment in the study. Two tools were used for data collection. The first tool comprised a questionnaire that collected participants' perceptions of their teaching practices before and after the course. Due to the absence of a validated tool, a self-developed questionnaire with 31 questions was utilized, and its internal consistency was calculated as 0.997⁹. The second data set was obtained from the participants' pre- and post-test scores. The tests consisted of One-best Multiple-Choice Questions (MCQs) and were taken on computers. Each test carried 10 marks.

The data was collected through REDCap software, the data files were transferred from REDCap to SPSS and the final analysis was done on SPSS version 26. Mean \pm SD/Median (IQR) was reported for the quantitative variables based on normality. Categorical variables were reported by frequency

and percentages. McNemar-Bowkers Test was applied to analyze the differences in the pre and post course perceptions. A p-value of < 0.05 was considered significant. A P-value of <0.05 was considered statistically significant.

Results

A total of 20 participants were enrolled in the CHPE course and all agreed to participate. The mean age of participants was 32.40 ± 6.73 years. Majority were female 15 (75%). Among the participants, 11 (55%) were lecturers while 02 (10%) were instructors. Among the participants 12 (60%) had a master's degree, 7 (35%) had bachelor's degree and 1 (05%) had an MCPS degree.

Participants generally felt more confident about their teaching and assessment practices before attending the course, however, statistically the results were not significant. Regarding teaching methods, faculty showed less confidence in the preparation of lesson plans (pre-course 89.47%

vs post-course 66.66%) and in interactive lectures (100% vs 72.22%), case-based learning (52% vs 44%), flipped classroom (52% vs 39%) [Figure 1].

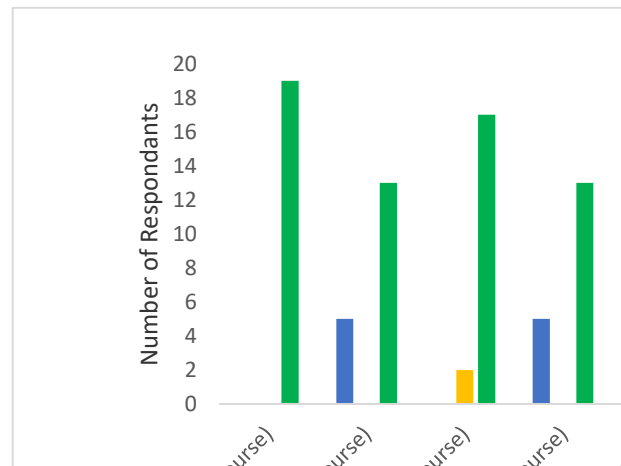
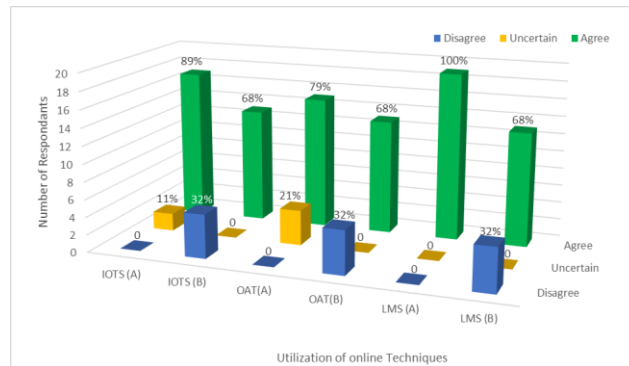


Figure 1. Participants' perceptions regarding their ability to utilize teaching strategies.

A similar trend was observed in perceptions regarding their ability to effectively utilize various assessment techniques and online tools [Figure 2]. Participants' perceptions about item development (pre-course 78.94% vs 72.22% post-course) and development of OSCE and OSPE stations (pre-course 73.68% vs 66.66%) post-course) decreased after attending the course. Participants' perceptions regarding 'selection of appropriate teaching tools' (pre-course 84.21 vs 72.22 post-course) also showed a downward trend. They expressed uncertainty about developing quality assessment tools. Additionally, faculty recognized a greater need for further knowledge on workplace-

based assessments ($p = 0.6$) and inter-professional education ($p = 0.3$) within their specialties.



IOTS (A); Interactive online teaching sessions (Pre-course), IOTS (B); Interactive online teaching sessions (Post-course), OAT (A); Online Assessment Techniques (Pre-course), OAT (B); Online Assessment Techniques (Post-course), LMS (A); LMS for Teaching & Assessment (Pre-course), LMS (B); LMS for Teaching & Assessment (Post-course)

Figure 2. Participants perceptions regarding effective utilization of online tools (pre & post course).

A comparison of pre- and post-module tests showed a significant change in the participant's scores in 3 out of 4 modules as well as the total score of all modules combined. In modules 1,2 and 4 the pre-test medians were 5,6 and 6 respectively, while the post-score medians increased to 10,10 and 8. Comparison of pre- and post-scores between male and female participants was more or less the same. In modules 1 and 2, males scored slightly higher than females in the pre-test however pre-test scores of modules 3 and 4 were equal in both genders. However, in module 2, the post-test, median score decreased to 4 (Interquartile Range {IQR}: 3-5) for males

suggesting less improvement, while females showed a slight increase to 5 (IQR: 5-6), indicating better progress. In the post-test scores both genders secured equal marks in modules 1 and 3 while females scored higher in module 3 and males scored higher in module 4, (Table I).

Discussion

The present study determined the impact of CHPE course on the perceptions and knowledge of medical and allied health faculty at Indus University of Health Sciences, before and after the course. The demographic data of our participants highlighted a predominance of females, which reflects the global trend.¹⁰ The educational qualifications of the participants suggested a well-balanced cohort, with participation from all the Allied Health specializations at our institute.¹¹

Interestingly, participants' perceptions of their teaching, assessment strategies, and use of online tools changed significantly after attending the course. Initially, they believed they could effectively teach using modern methods and develop assessment tools that aligned well with the intended learning objectives. However, the course provided an opportunity for self-reflection.¹² As a result, in post-course questionnaires, many participants expressed uncertainty about their teaching practices and assessment strategies, revealing a shift in confidence as they recognized areas for improvement.^{13,14}

Numerous studies have emphasized the importance of faculty roles and capacity building.⁴ The evaluation of the impact of this CHPE course will enable the institute to strengthen this area of faculty development.¹⁵

Table I: Pre and post-test score differences among the genders.

		Male	Female	Overall
Module 1: Core concepts in Health professional Education				
Pre-test	Median (IQR)	6(2-9.50)	5(3-6)	5(3-7)
	Min-Max	(2-10)	(1-9)	(1-10)
Post-test	Median (IQR)	10(10-10)	10(10-10)	10(10-10)
	Min-Max	(10-10)	(2-10)	(2-10)
Module 2: Teaching and learning				
Pre-test	Median (IQR)	5(3.50-6)	4(4-5)	4(4-5.8)
	Min-Max	(3-6)	(3-6)	(3-6)
Post-test	Median (IQR)	4(3-5)	5(5-6)	5(5-6)
	Min-Max	(3-5)	(3-6)	(3-6)
Module 3: Assessment in Health Professional Education				
Pre-test	Median (IQR)	6(4-8)	6(5-9)	6(4-8)
	Min-Max	(4-8)	(2-10)	(2-10)
Post-test	Median (IQR)	10(8-10)	10(10-10)	10(10-10)
	Min-Max	(8-10)	(8-10)	(8-10)
Module 4: Specialty-based teaching skills				
Pre-test	Median (IQR)	6(4-8)	6(4-6)	6(4-6)
	Min-Max	(4-9)	(2-10)	(2-10)
Post-test	Median (IQR)	10(6-10)	8(6-10)	8(6-10)
	Min-Max	(6-10)	(6-10)	(6-10)

Additional insights were revealed by analyzing performance differences based on gender. Males outscored females in the pre-test median in Modules 1 and 2. However, females showed more increase in the post-test from the baseline, suggesting that although males had an initial advantage, females made significant progress. This could indicate that women responded better to the teaching strategies used in these modules or that they interacted with the content in a way that promoted learning.¹⁶ Numerous research studies have demonstrated significant gender variations in locus of control and learning strategy utilization, which may account for the differences in performance seen in our study.^{17,18}

In Modules 3 & 4, females exhibited a more consistent performance in the post-test, achieving a narrower IQR, while the broader IQR for males suggested more variability in their performance. Although historically it had been assumed that due to the hormonal changes, females are more prone to variability in behavior; recent studies have proven otherwise. An article published in April 2021 reported that men show greater variability than women. Interestingly, the same variability has also been negatively associated with decreased academic performance; our study findings are consistent with this notion.^{19, 20}

Our study revealed a notable change in faculty perceptions about their teaching. However, due to the short time frame between the conclusion of the course and the survey, we did not observe any long-term impact on teaching strategies. As noted by Kirkpatrick and Kirkpatrick, while immediate reactions to training are often measurable, observable changes in behavior and practice typically require more time and consistent reinforcement.²¹ This observation is supported by a systematic review of faculty development by Steinert et al., which found that although participants demonstrated improvements in teaching behaviors and skills, shifts in attitudes and actions were less frequently observed.²² To assess the long-term effects of the CHPE course, we plan to conduct post-course follow-up reflections, feedback, and collect sharing of success stories. This will help us evaluate how participants implement changes within their specialties and whether the newly acquired knowledge remains or diminishes over time.²³

Limitations of the study: The authors acknowledge that the minimum recommended sample size for a quasi-experimental study is 30, but due to limited resources, the first cohort of the course was restricted to 20 participants, who were then all enrolled for data collection. The present study will be considered a pilot, for further research in the upcoming batches of CHPE. Moreover, the current research was unable to evaluate the long-term impact of the course on the participants,

as recommended by Kirkpatrick, which diminishes the study's ability to demonstrate sustained behavioral change or organizational impact.

Conclusions

The results of our study showed an increase in the knowledge of participants reflected by the significant changes in pre- and post-test scores across all four modules. The course generated self-reflection among the participants and changed their perception of their teaching and assessment practices. Although it has some limitations, this study can be used as evidence for investing time and finances into the development and conduction of customized faculty development programs for Allied Health Sciences faculty.

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