



ORIGINAL ARTICLE

Unveiling the implementation puzzle: Dental curriculum integration in Pakistan - A faculty perspective.

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ABSTRACT... Objective: To explore the challenges faced by faculty during the implementation of integrated dental curriculum at their documented level of integration in dental institutes of Pakistan. **Study Design:** Qualitative Exploratory Study. **Setting:** The study was carried out across three dental institutions in Pakistan. **Period:** January 1, 2023, to June 30, 2023. **Methods:** A “Qualitative Exploratory Study,” carried out in three dental schools in Pakistan who are running integration of the existing curriculum for more than three years. Sampling technique employed was purposive sampling technique using criterion sampling strategy. Twenty one faculty members (seven from each institute) who were from basic sciences, preclinical sciences, clinical sciences & medical educationist were selected for one to one/online semi-structured interviews. Data saturation served as the criterion for determining the interview limit. The interviews were audio recorded and later on transcribed followed by thematic content analysis manually. **Results:** The researcher preferred a hands-on method without intrusion of computer software. Manual analysis was used because the transcript database was tiny (under 500 pages of transcripts). The procedure generated 154 codes, which were then categorized into five themes, including the difficulties and solutions in adopting an integrated dental curriculum in Pakistan. **Conclusion:** The implementation of an integrated dental curriculum is a difficult endeavor that calls for collaboration from all stakeholders. Three institutions took on these issues with a commitment, under the direction of their medical education departments, and developed strategies for effective execution. This study supports institutions that are having trouble making the transition.

Key words: Integrated Curriculum, Implementation, Process of Integration.

INTRODUCTION

Curriculum integration in education is a multifaceted concept that deliberately combines fragmented areas of knowledge, manifesting differently at program, course, and session levels. The inadequacy of conventional educational models to address interdisciplinary inquiries led to the development of integrated curricula, now recognized by accrediting bodies' worldwide.¹

Implementing integration in education demands substantial efforts from faculty and students, often requiring additional resources. It introduces new teaching and learning approaches, potentially unsettling both faculty and students unaccustomed to collaborative and active learning methods.²

Integrated curriculum views learning as a holistic endeavor, fostering connections between disparate topics.³ It offers several benefits, such as reducing overlap between subjects, enhancing relevance through real-life contexts, and nurturing skills applicable across disciplines and daily life.

The Ying-Yang symbol, representing balance and integration, aligns with the philosophy of integration seen in ancient Chinese and Indian traditional medicine. In the mid-20th century, this philosophy inspired the innovative SPICES curriculum, emphasizing integration. However, implementing integrated curricula is not without challenges, particularly in transitioning from a century-old tradition of traditional medical education.⁴

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The Harden Integration Ladder serves as a conceptual framework for understanding integration challenges. It aims to bridge the gap between basic and clinical health sciences, focusing on fostering critical thinking and student engagement.⁵ The ladder comprises 11 steps, ranging from temporal coordination to multidisciplinary education.⁶ While valuable for curriculum development, the distinctions between ladder steps may sometimes be unclear.

Chaos theory, a theoretical framework for this research, explores systems that exhibit unpredictable behavior while maintaining some degree of order.⁷ In education, where learning is non-linear, applying chaos theory offers innovative perspectives on complex systems, like educational institutions.⁸

The study's rationale lies in recognizing that the introduction of integrated curricula significantly impacts faculty members.⁹ Dental curricula worldwide evolve regularly to respond to changes in oral diseases' prevalence and severity. Understanding the challenges faced by faculty during integrated curriculum design and implementation is essential.¹

While curriculum integration is debated in medical education, its definition remains unclear. The integrated methodology involves collaborative topic or theme exploration, aiding students in making connections between various subjects.¹⁰ It also supports students' learning by preventing overwhelm through teacher guidance.¹¹

The absence of studies on faculty perceptions of transitioning from traditional to integrated curriculum in Pakistan, both at the outset and after implementation, highlights the need for research in this area.¹ Effective curriculum implementation is vital, requiring faculty commitment, institutional resources, and inter-departmental coordination. Integration can enhance long-term retention and comprehension among medical students.

Research question: How do faculty members experience and respond to the challenges encountered during the implementation of an

integrated dental curriculum?

Objectives

- To identify the challenges perceived by faculty during the implementation of an integrated dental curriculum in dental institutes of Pakistan.
- To explore the coping strategies employed by faculty in response to these challenges.

Operational Definition

By "Challenges in Implementation", the researcher means:

- The hindrances faced during the process of implementation of an integrated curriculum and
- The solutions opted or devised to overcome those hindrances

METHODS

A qualitative exploratory study based on the Interactive model of research design put forth by J. A Maxwell in 2005.



Figure-1. Interactive model of research design

Ethical considerations played a vital role in this research, primarily due to the face-to-face and online interactive data collection methods, which involved in-depth interviews with participants. In-depth interviews were chosen to uncover nuanced details not typically obtained through questionnaires.¹² Ethical approval for the research was obtained sequentially from relevant authorities. First, ethical clearance was obtained from the Ethical Review Committee (ERC) of the Institute "A", Rawalpindi, with reference number Riphah/IIMC/IRC/23/3021.

Subsequently, ethical permissions were secured from the Research Committees and Deans of Institute “B”, Rawalpindi, and Institute “C”, Lahore, to conduct interviews with their respective faculty members. Prior to commencing the interviews, all participants provided either written or verbal informed consent. They were assured of confidentiality, anonymity, and the disclosure of study findings upon request.

Participants were not promised any rewards or incentives for their participation in the study, ensuring their voluntary involvement.

The study was conducted over a six-month period, commencing on January 1, 2023, and concluding on June 30, 2023. It took place within three dental institutes that had implemented curriculum integration for at least three years. These institutes included:

1. Institute “A” from Islamabad.
2. Institute “B” from Rawalpindi.
3. Institute “C” from Lahore.

Ethical considerations and the study setting provided a robust foundation for conducting the research in an ethical and rigorous manner.

Study Design

When there is not enough information available regarding a phenomenon or a problem that has not been precisely identified, exploratory research is carried out. Exploratory research design involves many qualitative data collection techniques such as in-depth interviews, focus groups and projective techniques.¹³ The researcher in this inquiry is seeking to explore various challenges faced by faculty during implementation of integrated dental curriculum and how they cope up with them. The source of data is faculty interviews only. The researcher planned to take interviews of dental faculty of basic sciences, preclinical sciences, clinical sciences and medical educationist because they also went through experience and have great amount of information to share regarding topic understudy. So interviews of just medical educationist wouldn't be sufficient as done in previous studies.

Study Population

A total of 21 faculty members from three different dental institutes participated in the study. There were 7 faculty members from each institute who were part of the integrated dental curriculum implementation when it was started in their institutes more around three years back. The participants were faculty (basic sciences, preclinical sciences, clinical sciences, medical educationist) of three dental institutes of Pakistan that are following integrated curriculum for at least 3 years. For data triangulation participants were asked to share the documents representing integrated teaching sessions in the curriculum. For theory triangulation, the transcripts were shared with a colleague who is an expert in medical education and his/her views were taken to interpret the meanings of the transcripts.

Sampling

In qualitative research, purposeful sampling, which is distinct from convenience sampling and probability sample, is used. Initially researcher contacted the medical educationist of the institute who provided researcher information about the faculty of basic, preclinical and clinical sciences who was part of the integrated curriculum implementation process. Faculty members from basic sciences, preclinical sciences, clinical sciences and medical educationist who were directly involved in the implementation of the integrated dental curriculum were eligible for inclusion in the study. Semi-structured face to face/ online in-depth individual interviews of 21 medical teachers of institutes following integration at least since 3 years were included in the study to get the knowledge about challenges they faced while implementing integrated dental curriculum and coping techniques employed. Purposeful sampling technique was employed to select the faculty members.¹⁴

Data Collection Methods and Analysis

The systemic literature review along with critical appraisal of important research articles helped to develop many themes related to the challenges faced & coping techniques employed during implementation of integrated dental curriculum. Data were collected through semi-structured face

to face/online interviews of the faculty members in quiet, comfortable and safe environment preferably in faculty offices or through zoom. Rapport building was done by meeting the faculty members and taking prior appointments using emails and cell phone text messaging services. The whole process of recording interviews was briefed to every participant before starting the interview and confidentiality and anonymity made sure. The interviews were then audio recorded. Before transcription, the participants were assigned codes to maintain confidentiality and anonymity. After this stage, the data was transcribed by researcher herself in word document on lap top.

Manual Qualitative Data Analysis

Qualitative data analysis is quite labor intensive and requires in-depth knowledge of research.¹⁵ When analyzing qualitative data by hand, researchers read the information, hand-mark it, and segment it. Cutting and pasting or applying color coding to identify text segments are two methods for analyzing text data.

Quality Assurance Strategies

The authentication of the data collection and data analyzing techniques ensures the quality of the qualitative research.¹⁶ Eight procedures are listed by Creswell: member checking, thick description, triangulation and multiple data sourcing, peer review, debriefing for external checks, negative case analysis, clarification of researcher bias, and external audits.¹⁷

Credibility: Reflexive Journal, Peer debriefing sessions, Member checking. **Transferability:** Rich details about the participants' responses and researcher's interpretation of the responses. **Dependability:** Whole process of research elaborated in great detail. **Conformability:** Objectivity maintained through triangulation.

RESULTS

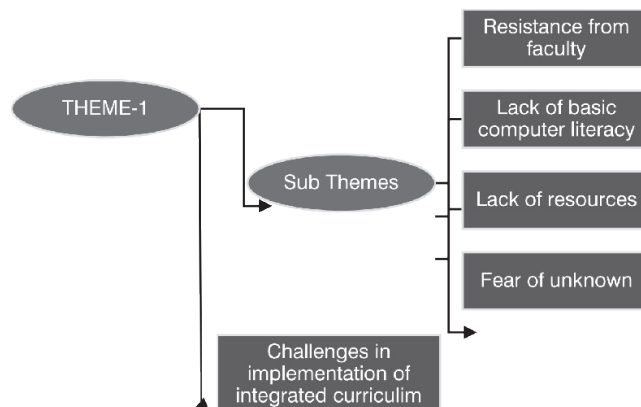


Figure-2. Theme 1 of results

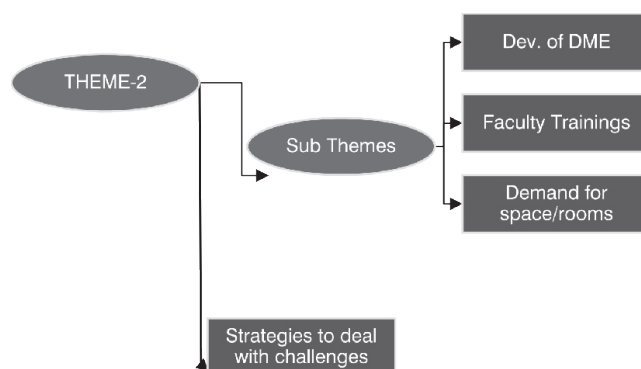


Figure-3. Theme 2 of results

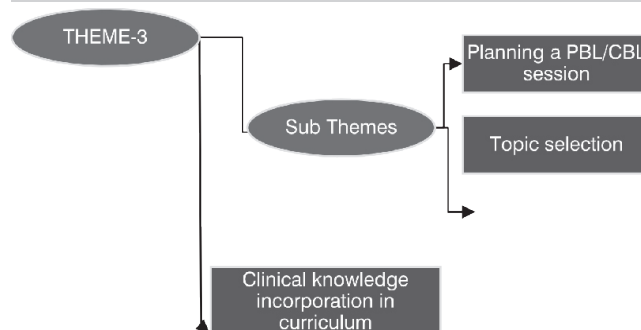


Figure-4. Theme 3 of results

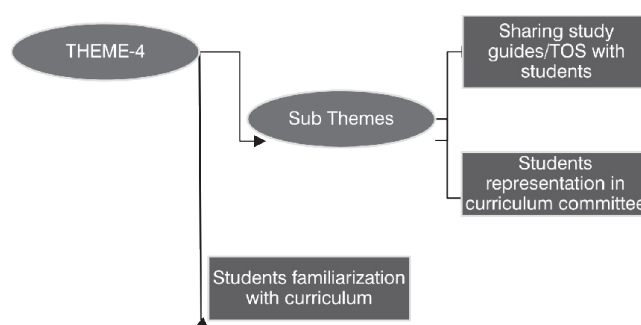


Figure-5. Theme 4 of results

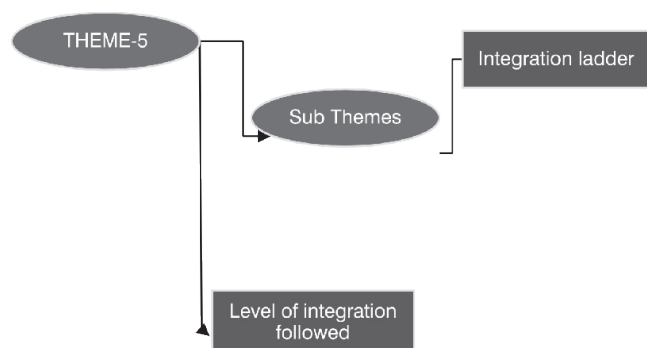


Figure-6. Theme 5 of results

DISCUSSION

This study focuses on faculty perspectives as it examines difficulties encountered and coping mechanisms used during the implementation of an integrated dental curriculum. The reform intends to improve the caliber of dental graduates by developing morally upright and scientifically knowledgeable practitioners who can address both straightforward and difficult issues.¹⁸ although there is obvious integration of the curriculum, for significant results the deeper, underlying difficulties must be adequately addressed. Since the majority of the literature to date focuses on the difficulties in implementing medical curricula, those who have experienced this curriculum reform in Pakistani dental schools bring special perspectives to the table.

Challenges during implementation of integrated dental curriculum

Introducing and then implementing the integrated curriculum is very challenging task. All of this effort is done to shift the curriculum from teacher centered to student centered to make skillful professionals.¹⁹ Multiple hitches/hindrances are faced during the way. May it be resistance from faculty or issues related to resources/budgets/infrastructure, dealing with them very wisely is the only requirement. The findings indicate that the successful implementation of newly introduced interventions demands sustained intrinsic and extrinsic motivation, as procedural and contextual challenges emerge at multiple stages of the adoption process. Literature suggests that Curriculum integration occurs when components of the curriculum are connected and related

in meaningful ways by both the students and teachers.¹⁴ One study suggests that running and implementing integrated curriculum is tedious & resource intensive task and lack of resources is biggest impediment in successful implementation¹. Literature suggests that effective curriculum integration takes couple of years it's not one week or one month process. This study explores the challenges encountered by faculty members in understudied institutions and examines the strategies employed to overcome them.

Strategies to deal with challenges

Designing and implementing an integrated curriculum is an uphill and complex task.²⁰ Institutes devised many strategies against specific challenges related to implementation of integrated dental curriculum to ensure effective curriculum implementation. Institutional cultures emerge slowly and are extraordinarily impervious to attempts to alter them. This resistance was linked to a lack of resources, a refusal to give up old habits, intolerance from the resistant coworkers, a lack of support for ongoing development initiatives, and a lack of institutional support from the management and leadership of organizations.²¹ Literature suggests that faculty's understanding plays very important role in successful implementation of integrated curriculum.²² One study suggests that for successful implementation of the integrated curriculum frequent faculty meetings should be arranged to finalize the teaching schedule. In addition to that faculty should be provided with incentives & rewards too. Literature also suggests that mere integration of basic sciences with clinical sciences does not leads to successful implementation, active teaching methods should be introduced and applied too.²³ The findings of our study suggest that until and unless the authorities should be motivated enough to except and implement the curricular change and the faculty are made aware of the benefits of the integrated curriculum through faculty development sessions/workshops etc. so that integrated curriculum is implemented effectively for the better understanding of the students successful implementation of integrated dental

curriculum will stay a mystery. In our study findings also suggest that as students are the major stakeholders they should be well aware of the curriculum they are following and should be free to express their opinion about the curriculum. This can be done by organizing sessions/workshops for students and also allowing them to represent in the curriculum committee. Institutes under study did this to overcome the challenges during implementation of integrated curriculum. One study suggests that increasing intradepartmental and interdepartmental interaction improves the relations and leads to successful implementation of the integrated curriculum.²⁴

Clinical knowledge incorporation in curriculum

Literature suggests early clinical exposure (ECE) has an important role in teaching different aspects of professionalism and emphasizing the clinical importance of material covered during the basic science years and can also influence career choices.²⁵ Basic science and clinical teachers alike identify the need for greater integration in the curriculum. Clinical Exposure of students to real patients in first year and curriculum stimulating research are the areas of concern in the study. Clinical knowledge incorporation is a must in integrated curriculum. Basic sciences topics should be taught in clinical relevance so the students better understand the topic/theme. It is one of the important components of the spices model. Findings of our study suggest the clinical knowledge incorporation should be through properly planned PBL/CBL sessions. Literature suggests that students should be prepared for dental education for integrated care practice rather than dental education for traditional practice. Focus should be on developing competencies.²⁶ One study suggests that introducing the integrated curriculum which promotes critical thinking & problem solving skills in learners increases the chances of successful implementation of integrated curriculum. The curriculum must be intellectually challenging.

Student's familiarization with curriculum

The findings indicate that students constitute a key group of stakeholders and should be well-

informed about the curriculum in which they are enrolled. Incorporating student perspectives through representation on curriculum committees is essential for responsive and inclusive curriculum development. Structured orientation sessions or targeted workshops should be implemented to enhance students' understanding of the integrated modular curriculum, thereby fostering their motivation and confidence in performing effectively during assessments. According to literature, communication is one of the hindrances in successful implementation of integrated curriculum may it be with students or faculty.¹ One study suggests that in integrated curriculum students are more interactive and intellectually active due to interactive teaching strategies applied.²³ The study suggests that when students have a clear understanding of the integrated curriculum being implemented and their corresponding level within it, they are more likely to adapt effectively. In contrast, insufficient familiarization contributes to confusion and uncertainty.

Level of integration followed

According to the literature, faculty, departments, and individuals should agree on the degree and kind (horizontal and vertical) of integration depending on the viability and resources available. Sometimes starting with partial integration is preferable, and over time, the level can be gradually raised.¹⁰ Findings indicate that initiating curriculum reform through achievable mid-level strategies, such as levels 6 or 7 on Harden's integration ladder, enhances implementation feasibility. Adopting a phased approach that begins with horizontal integration, and subsequently introducing vertical integration across sequential stages of education, facilitates a more coherent progression and promotes smoother curricular alignment. Literature indicates that, during the initial phases of integrated curriculum implementation, faculty and administrators primarily perceived it as a scheduling reorganization. However, integration can be operationalized at multiple levels, contingent upon a range of contextual and institutional factors that influence its successful execution. Achieving the trans disciplinary level

of integration represents the highest and most complex stage on the integration continuum, and it cannot be attained instantaneously. It requires a sustained, collaborative effort among faculty across disciplines, the dissolution of traditional subject boundaries, and the development of a shared pedagogical framework centered on real-world problems rather than discrete subject content. This level of integration demands significant institutional commitment, faculty development, and curricular restructuring over time to ensure coherence, relevance, and meaningful learning outcomes.

LIMITATIONS

Due to time constraints, data gathering was limited to interviews only, with potential sources including curricula and timetables. For the same reason, the original FGD proposal to collect student data was abandoned. Some participants neglected to check their transcripts as a group despite text and WhatsApp reminders.

CONCLUSION

Due to faculty reluctance and budget limitations, implementing integrated dental curriculum is difficult. The study emphasizes that effective implementation requires teamwork, inspiration, infrastructure, and financial backing. Other institutions can navigate the shift to integrated curriculum in dentistry by sharing issues and solutions.

RECOMMENDATIONS

The study explored the challenges faced and coping strategies employed during the implementation of an integrated dental curriculum. To build upon these findings, comparative research is recommended to evaluate similarities and differences across diverse institutional contexts. Additionally, incorporating students' perspectives on the implementation process would provide a more comprehensive understanding and enhance the body of literature in medical education.

While the thematic analysis revealed several critical insights, further in-depth exploration of the specific coping strategies identified is warranted. Each strategy should be examined individually

to evaluate its effectiveness, sustainability, and relevance within varying educational environments.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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3	Rida Haque: Interpretation.
4	Saher Sultan: Interpretation.
5	Bilal Hassan: Data collection.
6	Fatima Iqbal: Data compilation, entry.