



Aalborg Universitet

AALBORG UNIVERSITY
DENMARK

Development of professional identity among dental students – A qualitative study

Du, Xiangyun; Al Khabuli, Jumma O.S.; Ba Hattab, Raidan A.S.; Daud, Aala; Philip, Nebu I.; Anweigi, Lamyia; Matoug-Elwerfelli, Manal; Ali, Kamran

Published in:
Journal of Dental Education

DOI (link to publication from Publisher):
[10.1002/jdd.13092](https://doi.org/10.1002/jdd.13092)

Creative Commons License
CC BY 4.0

Publication date:
2023

Document Version
Publisher's PDF, also known as Version of record

[Link to publication from Aalborg University](#)

Citation for published version (APA):
Du, X., Al Khabuli, J. O. S., Ba Hattab, R. A. S., Daud, A., Philip, N. I., Anweigi, L., Matoug-Elwerfelli, M., & Ali, K. (2023). Development of professional identity among dental students – A qualitative study. *Journal of Dental Education*, 87(1), 93-100. <https://doi.org/10.1002/jdd.13092>

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal -

Take down policy

If you believe that this document breaches copyright please contact us at vbn@aub.aau.dk providing details, and we will remove access to the work immediately and investigate your claim.

ORIGINAL ARTICLE

Development of professional identity among dental students – A qualitative study

Xiangyun Du PhD¹ | Jumma O. S. Al Khabuli PhD² | Raidan A. S. Ba Hattab PhD² |
Aala Daud MSc² | Nebu I Philip PhD² | Lamyia Anweigi PhD² |
Manal Matoug-Elwerfelli PhD² | Kamran Ali PhD²

¹Aalborg University, Aalborg, Denmark

²College of Dental Medicine, QU Health, Qatar University, Doha, Qatar

Correspondence

Kamran Ali, PhD, College of Dental Medicine, QU Health, Qatar University, Doha, Qatar.

Email: ali.kamran@qu.edu.qa

Funding information

The Qatar National Library

Abstract

Purpose: The study explored dental students' perception of their professional identity (PI) development at a newly established dental college with a problem-based learning (PBL) curriculum.

Methods: Qualitative methods based on focus groups were used for data collection. The conceptual framework of the study was informed by a subject-centered sociocultural approach to PI development. Purposive sampling was used to collect data from five focus groups of undergraduate dental students to gain a deeper understanding of their PI development in a PBL environment.

Results: Out of a total of 38 dental students in years 2 and 3, 34 students (89.47%) participated in the focus groups. A theory-driven thematic analysis was used to dissect the views and experiences of the participants to explore factors contributing to PI development in the early years of the program. At an individual level, PBL was seen to be appropriate for PI development. However, some participants placed more emphasis on practical training in operative dental skills. Relational sources especially role modeling by the PBL facilitators and faculty staff were identified as a key factor to nurture PI development. Mixed views were observed on the value of PBL to enhance team-working skills. The participants also identified challenges of PBL and provided recommendations on further improvements to enhance the learning experiences of the students.

Conclusions: This study provided useful insights into a PBL curriculum at a newly established dental institution. The findings underscore the value of PBL in developing PI and also highlight the challenges of implementing PBL in a socio-cultural context and pedagogical implications for further program improvement.

KEYWORDS

dental students, dentistry, problem-based learning, professional identity

This is an open access article under the terms of the [Creative Commons Attribution](https://creativecommons.org/licenses/by/4.0/) License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited.

© 2022 The Authors. *Journal of Dental Education* published by Wiley Periodicals LLC on behalf of American Dental Education Association.

1 | INTRODUCTION

Professional identity (PI) refers to “*how we perceive ourselves within our occupational context and how we communicate this to others.*”¹ PI development in medicine involves the transformation of a lay person into a physician.² Students in healthcare professions begin learning through legitimate peripheral participation, initially by observing and later by performing basic tasks. The student is viewed as an active participant who learns from and with the community. Social interaction with the healthcare community fosters a PI that is akin to the acquisition of knowledge, skills, and behaviors.³ Development of PI in undergraduate healthcare education curricula is a complex process that is shaped by sociocultural environment, academic, and clinical experiences, expectations, and their interaction with personal factors, values, beliefs, and obligations.⁴

PI development entails “an integration of the professional self and the personal self.”⁵ Literature in higher education has highlighted the role of the learning environment in supporting student development of PI in diverse ways including; connecting curriculum and work; concrete pedagogical intervention such as integrating professional practices in classrooms; creating a work-related environment; and providing professional socialization opportunities and experiences.⁶ Teamwork has also been identified as an effective method in supporting PI development.^{7,8}

A recent scoping review posits PI development in undergraduate medical education in the context of individual, societal and relational factors.⁹ Individual factors related to PI include self-motivation to gain competence and engagement in critical thinking, reflective practice, and lifelong learning. Relational factors hinge on the development of professional relationships with patients, peers, supervisors, and other team members. Finally, societal factors relate to recognition of professional roles, societal expectations, responsibilities, and code of conduct. A comparative study of students’ perceptions of professional identities showed that medical and nursing students reported clear articulation of their professional belonging.¹⁰ In contrast, dentistry and pharmacy students related their PI primarily by contrasting it with the medical profession.

Development of PI in dentistry may be influenced by several factors including self-efficacy, support from role models and mentors, professional socialization, learning environment, and reflection.¹¹ Although literature in dental education has addressed various aspects associated with PI such as cultural competence and social responsibility^{12,13} ethics instruction,¹⁴ professional responsibly and professionalism in patient care,¹⁵ original research on students’ perceptions on their PI development within dental edu-

cation is relatively limited. Therefore, dental students’ perceptions of PI merit further investigation.¹⁶ As suggested in the current literature, PI formation is a developmental process bounded by specific social, cultural, and environmental factors and there is a need to further explore how dental students perceive PI development during undergraduate education.^{11,12,17}

The current study adopts a subject-centered sociocultural approach to PI development which has been established by integrating the prevailing theories.¹⁸ The conceptual framework of PI for the current study is underpinned by three interrelated dimensions, embracing 1) the subjectivity of individual values (containing interest, motivation, and efficacy beliefs, among others) and their sociocultural sources comprising 2) interpersonal relations, and 3) interactions with environmental conditions, for example learning activities, institutional values, facilities, and policies). Consequently, the development of PI is a process of agentic actions (when students participate in practices of achieving their identity) and interactions with social, cultural, and historical aspects. PI development, including both ‘seeing oneself as’ and ‘acting as’, is a dynamic and context-bound process relating to socio-cultural and environmental aspects.¹⁸ In the field of dental education, students’ PI is more than just an awareness of clinical competence, but also involves students’ discourse and actions towards developing a sense of belonging to the dental profession.^{11,15} The process of PI development is individually different with differentiation in personal morals, ethical thinking, and self-understanding.¹⁹ Thus, developing a PI in the health profession also involves negotiations regarding the social expectations regarding a specific professional role and individual needs and aptitudes engaging in this role.¹⁷

This study was conducted at a newly established college of dental medicine in Qatar. Being the first dental educational institute in the country, the first cohort of students was enrolled in 2019 in a 6-year full-time program. English is the official medium of instruction and students construct their scientific knowledge in PBL sessions based on clinical scenarios. The faculty support student learning by signposting them to relevant topics in lectures and tutorial sessions. The PBL sessions are aimed at encouraging students to integrate biomedical knowledge with behavioral, social, ethical, and biopsychosocial approaches to patient care. Evaluation of the students during PBL cases by the facilitators contributes to 10% of the final summative grade. Knowledge assessments related to PBL cases are undertaken in quizzes and end-of-semester examinations which carry 90% weighting.

The present study aimed at exploring early-year students’ perceptions of how they develop a sense of PI

in dentistry through their activities in PBL at a newly established College of Dentistry in Qatar.

2 | METHODS

2.1 | Research ethics

Ethics approval was provided by the Qatar University, institutional review board, (IRB No. QU-IRB 1596-EA/21, dated 05 September 2021).

2.2 | Setting

Qatar University, College of Dental Medicine

2.3 | Study design

Qualitative methods using focus groups were used to explore the subjective and complex nature of PI development¹⁸ and to identify emerging patterns in a unique pedagogical context, that is, PBL. The methodology was chosen to gain a deeper understanding of PI development in an undergraduate dental program with small cohort size.¹¹

2.4 | Sampling technique

The purposive sampling technique was used to invite all year 2 ($n = 24$) and year 3 ($n = 14$) students to participate in the study.

2.5 | Data collection

The invites were sent by official emails to the students and included a participant information sheet explaining the purpose of the study and the role of the participants. The year leads for the two cohorts functioned as gatekeepers for the research invites. Data collection was conducted from November 20 to December 10, 2021. The research team developed a topic guide for the focus groups following the subject-centered sociocultural approach to conceptualizing PI¹⁸ and a framework proposed earlier in this study, namely including individual interest, motivation, efficacy beliefs, and their sociocultural sources such as interpersonal relations, and interactions with environments. The topic guide included items related to experiences in PBL sessions and perceived confidence levels in becoming a dentist. Issues emerging from group discussions were

TABLE 1 Dimensions of the theoretical framework and relevant questions in the topic guide for focus groups

Dimension	Questions included in the topic guide for focus groups
Individual values	<ul style="list-style-type: none"> • Do you consider PBL to be an appropriate method of learning? • Does PBL contribute to the development of your communication skills? Please explain • What are your views regarding the usefulness of PBL sessions in giving you a sense of professional identity? • Which other learning activities in your course enhance your sense of professional identity?
Interpersonal	<ul style="list-style-type: none"> • Do interactions with peers in your PBL group provide adequate opportunities for collaborative learning and teamworking skills? Please explain • How would you describe your relations and social interactions with your peers and faculty staff including PBL facilitators? • Which characteristics in your PBL facilitators enhance your motivation to learn? • Did your PBL facilitators and/or other faculty staff demonstrate effective role modeling to help you develop a sense of professional identity?
Environmental	<ul style="list-style-type: none"> • Do you consider the PBL environment to be appropriate to support your learning? • In your opinion, the workload related to PBL sessions is manageable? Please explain • How can the learning environment be improved to facilitate the development of your professional identity? • How would you comment on the institutional policies regarding the weighting of PBL assessments in summative assessments?

probed further and participants were encouraged to elaborate on their thoughts further.²⁰ Table 1 summarizes the topic guide questions relevant to each dimension of the theoretical framework. All focus groups were conducted in English and lasted 70–90 min.

2.6 | Data analysis

Data analyses were conducted by integrating both theory-driven and thematic analysis techniques. The content analysis focuses on the condensation of meanings related to the context.²¹ A few steps were conducted for the

TABLE 2 Responses of participants relevant to each dimension of the theoretical framework

Dimension	Enablers	Barriers
Individual values	<ul style="list-style-type: none"> PBL is appropriate for the acquisition of underpinning scientific knowledge relevant to dentistry (~100%) PBL is helpful in developing problem-solving skills (~65%) PBL enhances the development of communication skills (~65%) 	<ul style="list-style-type: none"> PBL sessions are time-consuming; more time could be devoted to learning practical skills which are more relevant to dentistry (~30%)
Interpersonal	<ul style="list-style-type: none"> Faculty staff and PBL facilitators can be effective role models (~90%) Professional competence, humanistic personal qualities, and effective communication skills of PBL facilitators contribute to positive learning experiences for the students <ul style="list-style-type: none"> Faculty staff and PBL facilitators are an authentic source of knowledge (~80%) Interactions with peers facilitate collaborative learning and development of teamworking skills (~65%) 	<ul style="list-style-type: none"> Negative attitudes of PBL facilitators (~30%) Authoritarian attitude, confrontational behavior, and lack of patience impacted adversely student confidence <ul style="list-style-type: none"> Interactions with peers are time-consuming (~35%)
Environmental	<ul style="list-style-type: none"> Safe learning environment (100%) 	<ul style="list-style-type: none"> The workload related to PBL sessions is intense and unmanageable (~95%) The weighting of student performance in PBL sessions is inadequate (~85%) Inadequate feedback by PBL facilitators (~40%)

analysis: first, interview data were audio-recorded and transcribed for coding. Secondly, the proposed conceptual framework in this study including the three dimensions – individual values, relational sources, and environmental conditions – was used to guide the initial categorization of data information, with several rounds of reading the transcripts for categorizing meanings were conducted to ensure that our interpretation of the meanings suited the context.²⁰ Next, emerging themes were identified under each dimension of the framework, which was compared within each group and among separate groups before any reasonable interpretation and conclusion could be suggested.

3 | RESULTS

Out of a total of 38 dental students in years 2 and 3, 34 students (89.47%) participated in the focus groups. Five focus groups were conducted (27 females, and seven males, ages ranging from 19 to 22). Three focus groups were organized for year 2 ($N = 20$); the first with seven females and two males, the second with three females and one male, and the third with five females and two male participants. Two focus groups were organized for year 3 ($N = 14$), one with seven females, and no male participants, and the other with five females and two male participants.

Following an initial structure of the three dimensions of the theoretical framework of professional identity

development, this section presents the key themes emerging from data analysis. The results are summarized in Table 2.

3.1 | Individual values

The focus group data revealed mixed opinions regarding the role of PBL to support their career readiness as a dentist and motivation levels in the undergraduate program.

Approximately 40% of the participants regarded PBL to be conducive to their development as a dentist. Participants expressed their appreciation of opportunities to develop profession-related skills in the program. Approximately 65% of participants considered PBL to be helpful in developing problem-solving and communication skills through collaborative learning with their peers.

“I like the PBL way of learning, and clinical dentistry involves problem-solving and teamwork... Initially, I was shy to participate but I learned so much about how to communicate with others... I guess these skills are important for a dentist.” [student 2, group 3]

Approximately 30% of the participants also underscored the importance of learning practical skills as they perceived clinical skills to be more relevant to their future work as a dentist.

“PBL is useful, but it takes a lot of effort and I think it is important to have more time to learn operative skills in the simulation lab, that’s the core for a dentist.” [student 5, group 1]

The diverse opinions regarding the relative value of applied scientific knowledge vs hands-on practical skills generated interesting discussions amongst the participants. Nevertheless, there were participants across the board who recognized the importance of underpinning scientific knowledge to support their clinical practice as a dentist.

“I feel it is important to have a solid foundation of applied biomedical knowledge before we start treating patients so that the care we provide to the patients is supported by science.” [student 1, group 2]

3.2 | Relational sources

There was a broad consensus amongst the participants that role models are important for the students to enhance their motivation to practice dentistry and students’ experiences. Approximately 90% of participants felt that their interactions with the faculty had a marked influence on shaping their professional development and career choices.

“My PBL facilitator has had a huge influence on my learning, I really look up to them, and I hope I can follow their footsteps to become a competent dental professional when I graduate.” [student 4, group 3]

The majority of participants (~90%) considered professional competence, humanistic personal qualities, and effective communication skills amongst the PBL facilitators to be important elements that contributed to the positive learning experiences of the students. Approximately 30% of participants reported authoritarian attitude, confrontational behavior, and lack of patience amongst PBL facilitators which impacted adversely on their confidence and willingness to pursue their academic goals.

“I had an excellent time in my PBL group last semester, my facilitator was truly knowledgeable, kind, and supportive and allowed us the independence to discuss the PBL cases. Unfortunately, my current facilitator does not give us enough time to our group to discuss the patient cases, they want us to move forward at a fast pace which is not helpful.” [student 6, group 4]

In spite of recognizing the need for self-directed learning in PBL, over 80% of participants regarded the faculty as the most important source of knowledge and guidance to support their professional development. Experienced PBL facilitators with expertise on the topics covered in the PBL cases were considered to be a positive influence on the learning experiences of the students.

“We are expected to identify our learning objectives and apply scientific knowledge in solving clinical problems during our PBL sessions but having an experienced and knowledgeable facilitator helps to boost our confidence in how we approach the case and integrate our knowledge.” [student 7, group 2]

Participants in the study recognized the importance of collaborative learning and teamwork to support their future roles as a dentist. Dentistry. However, opinion was divided regarding the actual value of PBL in nurturing team working skills.

The majority of the participants ($N = 22$, 65%) shared positive views on developing team working skills with their peers in the PBL sessions. PBL was perceived to provide a multitude of opportunities to enhance teamwork and allowed group members to work together on “*identifying common goals*,” “*helping each other*,” “*providing peer feedback*,” “*showing mutual respect*,” “*effective communication*,” “*meeting deadlines*,” and so forth.

“We can work together to learn new information from each other as colleagues which enhances our interest in the topics, you also feel responsible for completing the tasks allocated to you.” [student 2, group 5]

However, one-third of the participants felt that collaborative learning in PBL sessions was time-consuming and they preferred exploring the topic areas individually to consolidate their knowledge.

“Teamwork should be good, but this is new for me, and it is just me... I prefer to manage my learning in my own time. I feel I can cover a lot more myself.” [student 3, group 1]

3.3 | Environmental conditions

Participants across the board viewed the PBL learning environment positively and considered it to be a safe space. However, they identified several areas related to PBL structure and learning environment that needed improvement.

PBL cases in year 2 addressed medical topic areas with limited context to dentistry. Participants across the board indicated their preference for PBL cases to be more relevant to dentistry as the medical content in the cases was too heavy and seemed less relevant to their future role as a dentist.

“The main reason I don’t put enough effort in PBL is that they are medical cases and not directly relevant to my career.” [student 8, group 5]

Secondly, the workload related to PBL was difficult to manage for approximately 95% of the participants. Attending two PBL sessions lasting 3-h each week left them with limited time to explore the topic areas in depth. Moreover, students felt they did not have adequate time or energy to focus on self-reflection.

“It took lots of time to prepare each PBL case as we have a lot of other academic commitments during the week. . . . so, we don’t have much time to discuss in the group or self-reflect.” [student 4, group 3]

Approximately 85% of the participants also reported their concerns regarding the weighting of PBL assessments which account for 10% of their end-of-semester scores. The majority of students felt that given the workload of PBL sessions, the weighting of PBL assessments should be increased to reflect their workload and efforts.

Approximately 40% of participants reported that feedback by PBL was inadequate. They emphasized the need for more structured, individualized, and immediate feedback by the facilitators.

“I wish I could get detailed feedback on my performance in PBL each week rather than having to wait for the PBL case to finish so I can focus on developing knowledge relevant to my future role as a dentist.” [student 7, group 4]

4 | DISCUSSION

This study aimed to explore dental students’ perception of their PI development in a PBL setting. A conceptual framework was established based on a subject-centered socio-cultural approach to support the research design of the study, suggesting three dimensions that are essential for PI development, including individual, relational and environmental aspects.¹⁸ The framework paved a baseline for our conceptual understanding of PI development as a complex, dynamic, interactive, and developmental process.^{17,22} Overall, the results of the study endorsed that PI develop-

ment in dental education involves not only intrapersonal development but also requires professional interactions between individuals and their learning environments.^{11,15} In addition, thematic analysis of empirical data from group interviews identified diverse patterns of students’ perceptions, which provide pedagogical implications to enhance the learning experiences of the students.

At an individual level, diverse opinions were observed regarding the value of PBL in nurturing a sense of PI amongst students. While most participants viewed PBL positively, others considered practical training on clinical skills to be more impactful in developing PI. These results suggest that while PBL can be used to promote students’ sense of PI, integrating PBL with practical training to facilitate competence in operative skills can enhance students’ learning experiences and how they relate to the profession in the early years of their curriculum. In addition, integration of medical and dental topic areas in the PBL cases from an early stage is more likely to support students in relating to their future professional practice as a dentist. Encouraging dental students’ meaningful engagement with the medical content warrants emphasizing the application of medical topics with clinical dentistry throughout the program. Segregation of medical and dental content is likely to reduce the motivation of dental students, as they may not be able to fully appreciate the relevance of medical knowledge to their professional practice.

At a relational level, role modeling by PBL facilitators and faculty staff emerged as a strong influence on cultivating PI amongst the students. Role models may be described as “individuals admired by their ways of being and acting as professionals.”²³ The findings of this study corroborate with studies on medical students. Role modeling ties in with the socio-cultural context in which communities of practice are embedded to foster learning, negotiation, and PI. Therefore, the professionalism of PBL facilitators not only impacts the learning experiences of students, their personal “positive experiences” influence their future career pathway after graduation.²⁴ Effective role modeling can be a powerful tool to enhance the transformation and empowerment of the students and involves a combination of conscious and subconscious elements. Excellence in role modeling hinges on the demonstration of high standards of clinical competence, quality clinical teaching skills, and the humanistic personal qualities of the trainers.^{24,25}

Over the last three decades, literature in medical education has emphasized the changing role of teachers from information providers to learning facilitators.²⁶ However, data from the current study suggest that the participants placed significant reliance on the role of PBL facilitators and faculty staff as an authentic source of knowledge. These findings highlight the challenges of implementing self-directed student learning in a society in which

teachers have been historically viewed as authority in the classroom.²⁷ Nurturing self-directed learners who are new to this model, requires educators to scaffold and structure learning to develop the underlying soft skills needed for students to be successful as self-directed learners. Inevitably, such implementation involves a change in the approach and mindset of learners and sustained efforts are required to bring about a cultural transformation in the learning environments.

Students reported several challenges and identified areas of further improvement in regard to the learning environment and PBL structure. Deficiencies in feedback by the PBL facilitators and intense workload related to PBL cases were considered to be the core issues by the participants. PBL offers valuable opportunities to provide individualized and timely feedback to the students. Feedback is an integral part of the learning process and is a fundamental component of several learning theories.²⁸ Feedback can help students to reflect on their performance and working with their facilitators, they can address any deficiencies in performance.³ Variations in the quality of feedback possibly reflect the varied experiences of PBL facilitators at our institution which include a mix of experienced faculty members as well as new facilitators with limited experience in PBL facilitation. Moreover, individual approaches to facilitation can vary due to facilitators' experiences in previous institutions. Finally, conflicts between facilitators' practices and pedagogical beliefs about PBL may influence the quality of facilitation and feedback. Transformation of pedagogical beliefs of university teachers accustomed to teacher-led education requires time and effort.²⁹ Based on the feedback from the participants, our institution is taking active steps to enhance the training of PBL facilitators to ensure consistency in facilitation practices. Moreover, the faculty is reviewing the workload of the PBL cases to ensure students do not feel burdened and can focus on self-reflection.

This study has a few limitations which need to be acknowledged. First, the study was conducted at a newly established institute with a small cohort size. Second, data collection was done using focus groups only. The current study did not dissect the impact of demographic variables including age, gender, and socio-economic background of participants on PI development. A deeper understanding of individual experiences could be gained through one-to-one semi-structured qualitative interviews. For future studies, the use of a mixed methods approach is proposed to allow triangulation of quantitative and qualitative methods to explore PI development in undergraduate dental programs. Nevertheless, the current study underscores a research-based approach to educational improvement and highlights the need for structured support for students with no prior experience in PBL. The findings may be rele-

vant to healthcare institutions exploring the use of PBL in their undergraduate curricula.

ACKNOWLEDGMENTS

The authors would like to thank all the student participants for their contribution to this research. Open access funding was provided by the Qatar National Library.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

REFERENCES

1. Neary S. Professional identity: what I call myself defines who I am. *Car Matt*. 2014;2(3):14-15.
2. Holden M, Buck E, Clark M, Szauter K, Trumble J. Professional identity formation in medical education: the convergence of multiple domains. *HEC forum Spring*. 2012;24(4):245-255.
3. Mann KV. Theoretical perspectives in medical education: past experience and future possibilities. *Med Educ*. 2011;45(1):60-68.
4. Holden MD, Buck E, Luk J, et al. Professional identity formation: creating a longitudinal framework through TIME (transformation in medical education). *Acad Med*. 2015;90(6):761-767.
5. Moss JM, Gibson DM, Dollarhide CT. Professional identity development: a grounded theory of transformational tasks of counselors. *J Couns Dev*. 2014;92(1):3-12.
6. Trede F, Macklin R, Bridges D. Professional identity development: a review of the higher education literature. *Stud Higher Educ*. 2012;37(3):365-384.
7. Tonso KL. Student engineers and engineer identity: campus engineer identities as figured world. *Cult Stud Sci Educ*. 2006;1(2):273-307.
8. Charness G, Chen Y. Social identity, group behavior, and teams. *Ann Rev Eco*. 2020;12:691-713.
9. Sarraf-Yazdi S, Teo YN, How AEH, et al. A scoping review of professional identity formation in undergraduate medical education. *J Gen Int Med*. 2021;36(11):3511-3521.
10. Morison S, O'Boyle A. Developing professional identity: a study of the perceptions of first-year nursing, medical, dental and pharmacy students. Nursing education challenges in the 21st century New York. *Nova Sci*. 2008:195-219.
11. Kwon JH, Shuler CF, von Bergmann H. Professional identity formation: the key contributors and dental students' concerns. *J Dent Educ*. 2022;86(3):288-297.
12. Brondani MA. Teaching social responsibility through community service-learning in predoctoral dental education. *J Dent Educ*. 2012;76(5):609-619.
13. Rubin RW. Developing cultural competence and social responsibility in preclinical dental students. *J Dent Educ*. 2004;68(4):460-467.
14. Gadbury-Amyot CC, Simmer-Beck M, McCunniff M, Williams KB. Using a multifaceted approach including community-based service-learning to enrich formal ethics instruction in a dental school setting. *J Dent Educ*. 2006;70(6):652-661.
15. Neville P, McNally L, Waylen A. Developing a dental scrubs ceremony to define professional identity and teach professionalism to dental undergraduates; lessons learned. *Eur J Dent Educ*. 2018;22(3):e542-e554.

16. Tubert-Jeannin S, Jourdan D. Renovating dental education: a public health issue. *Eur J Dent Educ*. 2018;22(3):e644-e647.
17. Moseley LE, McConnell L, Garza KB, Ford CR. Exploring the evolution of professional identity formation in health professions education. *New Dir Teach Learn*. 2021;2021(168):11-27.
18. Eteläpelto A, Vähäsantanen K, Hökkä P, Paloniemi S. What is agency? Conceptualizing professional agency at work. *Educ Res Rev*. 2013;10:45-65.
19. Blue CM. Cultivating professional responsibility in a dental hygiene curriculum. *J Dent Educ*. 2013;77(8):1042-1051.
20. Kvale S, Brinkmann S. *Interviews: Learning the Craft of Qualitative Research Interviewing*. Sage; 2009.
21. Elo S, Kyngäs H. The qualitative content analysis process. *J Adv Nurs*. 2008;62(1):107-115.
22. Cruess SR, Cruess RL, Steinert Y. Supporting the development of a professional identity: general principles. *Med Teach*. 2019;41(6):641-649.
23. Irby DM, Gillmore GM, Ramsey PG. Factors affecting ratings of clinical teachers by medical students and residents. *J Med Educ*. 1987;62(1):1-7.
24. Passi V, Johnson N. The impact of positive doctor role modeling. *Med Teach*. 2016;38(11):1139-1145.
25. Mohammadi E, Mirzazadeh A, Sohrabpour AA, Shahsavari H, Yaseri M, Mortaz Hejri S. Enhancement of role modelling in clinical educators: a randomized controlled trial. *Med Teach*. 2020;42(4):436-443.
26. Mattheos N, Christersson C, Högrström M, Hallstedt PA, Malmberg C, Hartsmar N. Multidisciplinary development of professional identity through a problem-based learning curriculum. *Eur J Dent Educ*. 2008;12(2):122-123.
27. Du X, Ebead U, Sabah S, Ma J, Naji KK. Engineering students' approaches to learning and views on collaboration: how do both evolve in a PBL environment and what are their contributing and constraining factors? *Euras J Math Sci Tech Educ*. 2019;15(11):em1774.
28. Kolb DA, Richard EB, Charalampos M. Experiential learning theory: previous research and new directions. *Persp Think Learn Cog Sty*. 2011;1(8):227-247.
29. Assen JHE, Meijers F, Otting H, Poell RF. Explaining discrepancies between teacher beliefs and teacher interventions in a problem-based learning environment: a mixed methods study. *Teach Teach Educ*. 2016;60:12-23.

How to cite this article: Du X, Al Khabuli JOS, Ba Hattab RAS, et al. Development of professional identity among dental students – A qualitative study. *J Dent Educ*. 2023;87:93–100.
<https://doi.org/10.1002/jdd.13092>