BMC Medical Education

RESEARCH

Open Access

Bridging the gap: student and staff views on teaching, learning, and assessment in dental education

Mirela Marinova–Takorova[1] and Zornitsa Mihaylova[2,3*]

Abstract

Background Contemporary dental education increasingly emphasizes competency-based learning, student engagement, and alignment between teaching, learning, and assessment strategies. Understanding the perceptions of both students and academic staff may support curriculum development and improvement of educational quality. This study explored key components of the educational environment at the Faculty of Dental Medicine, Medical University – Sofia, Bulgaria.

Methods A cross-sectional questionnaire-based study was conducted during the 2024/2025 academic year among Bulgarian students, international students, and academic staff. Two tailored questionnaires assessed self-reported lecture attendance, motivation and engagement, individualized support, practical skills development, and perceptions regarding alignment between course objectives and assessment methods. Data were analyzed using descriptive statistics, Pearson's chi-square test (χ^2), Fisher's Exact test where appropriate, and Cronbach's alpha coefficient for internal consistency reliability.

Results A total of 576 participants completed the survey, including 397 Bulgarian students, 122 international students, and 57 academic staff members. Approximately half of the students reported attending all lectures, while attendance related primarily to dental disciplines was more common among international students. Students most frequently reported attending lectures because they supported examination preparation and facilitated understanding of the material, whereas academic staff emphasized structured presentation and classroom discussions. More than half of the students reported not receiving an individualized educational approach, in contrast to academic staff perceptions. Bulgarian students more frequently preferred oral examinations, while international students demonstrated greater preference for practical and test-based assessments. Academic staff predominantly favored test-based examinations. Overall perceptions regarding alignment between examinations and course material were moderate to high across all respondent groups.

Conclusions Differences between student and academic staff perceptions highlight opportunities to improve communication, individualized support, and assessment strategies within multilingual dental education. The findings may support curriculum development and quality assurance processes in competency-based dental education. Further multi-institutional studies and additional validation of the survey instruments are recommended.

*Correspondence:
Zornitsa Mihaylova
z.mihailova@fdm.mu-sofia.bg

Full list of author information is available at the end of the article

© The Author(s) 2026. **Open Access** This article is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License, which permits any non-commercial use, sharing, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if you modified the licensed material. You do not have permission under this licence to share adapted material derived from this article or parts of it. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit http://creativecommons.org/licenses/by-nc-nd/4.0/.

Keywords Dental education, Student engagement, Assessment strategies, Educational quality, Competency-based education, Dental curriculum

Introduction

In recent decades, dental education has undergone substantial international reform, driven by rapid technological development, competency-based educational models, active learning strategies, and changing expectations regarding professional preparation [1–4]. Contemporary undergraduate dental curricula are increasingly designed to support the acquisition of clinical competence, professionalism, communication skills, leadership abilities, evidence-based decision making, and lifelong learning competencies required for modern dental practice [2, 3, 5].

The Association for Dental Education in Europe (ADEE) has played a central role in shaping contemporary European dental education through the Graduating European Dentist (GED) framework, which emphasizes competency-based curriculum design and integration of clinical competence, patient-centered care, professionalism, communication, research skills, and reflective professional development [2, 3]. These educational principles support harmonization of undergraduate dental education and promote alignment between educational objectives, teaching strategies, and assessment methods.

Recent literature has further emphasized the importance of modern teaching approaches and innovative educational models in dental education. In many dental schools, active learning methods, digital learning environments, case-based learning, simulation-based training, and clinically integrated teaching are already embedded in everyday educational practice. These approaches are increasingly regarded not as optional innovations, but as expected components of contemporary dental education [4]. At the same time, the quality of the educational environment remains strongly influenced by the quality of teaching and the methods used during undergraduate training [6]. Educational strategies significantly affect students' confidence, clinical performance, and professional development, ultimately influencing their future clinical practice and social integration [7, 8].

As dental technologies and clinical protocols continue to advance, future dental professionals must be prepared to adapt to new developments and continuously update their knowledge and skills throughout their careers. Consequently, contemporary dental education increasingly incorporates active learning strategies, digital tools, simulation-based learning, supervised clinical practice, and competency-based assessment approaches rather than relying exclusively on traditional lecture-based instruction [4].

In Bulgaria, higher education institutions have considerable autonomy in organizing curricula, teaching methods, and assessment procedures within the framework of national regulations. This autonomy enables faculties to continuously monitor and improve educational quality through internal quality assurance mechanisms.

The Faculty of Dental Medicine at the Medical University – Sofia maintains an active Committee of Quality of Education (CQE), responsible for monitoring and evaluating the educational process among undergraduate students, postgraduate trainees, and doctoral candidates. The CQE evaluates theoretical and practical training, communication between students and academic staff, and examination procedures.

Structured survey-based evaluations provide valuable insight into perceptions of the educational environment among students and academic staff. Such evaluations support identification of strengths and challenges within the educational process and may contribute to evidence-based improvements in curriculum organization, communication, teaching methods, and assessment practices. Despite the growing emphasis on quality assurance in dental education, limited published data are available regarding the perceptions of both students and academic staff within Bulgarian dental schools.

The broader value of such evaluations lies in their ability to identify differences between stakeholder perspectives, especially in multilingual programs where students may enter dental education with different educational backgrounds, expectations, and learning cultures. The study should therefore be interpreted within the context of a contemporary dental curriculum that combines traditional theoretical instruction with practical, clinical, and increasingly student-centered educational approaches.

Therefore, the aim of the present study was to evaluate students' and academic staff's perceptions of key components of the educational process at the Faculty of Dental Medicine, Medical University – Sofia, during the academic year 2024/2025. This study adds evidence on the alignment between assessment strategies and student engagement in multilingual dental programs in Eastern Europe.

Materials and methods

Study design and setting

A cross-sectional questionnaire-based study was conducted at the Faculty of Dental Medicine, Medical University – Sofia, Bulgaria. The study was coordinated by the Committee of Quality of Education (CQE), which

was responsible for participant recruitment and organization of the survey process.

Undergraduate dental education at the Faculty includes theoretical lectures, preclinical practical exercises, simulation-based and skills-oriented training, discipline-specific practical sessions, and supervised clinical patient work in the later years of study. Digital educational resources, clinical demonstrations, and case-based discussions are incorporated in several disciplines, although the extent and format of active learning approaches may vary between departments and courses.

Participants and sampling

The survey was conducted between March 17 and March 26, 2025. A stratified convenience sampling approach was used to recruit three participant groups: Bulgarian students, international students, and academic staff.

The target sample included undergraduate dental students from all academic years of the Bulgarian- and English-language tracks, including both preclinical and clinical phases of education, as well as academic staff involved in theoretical and practical teaching. The equal target number of Bulgarian and international students reflected the study design and was intended to facilitate comparison between the two language tracks.

Participation was voluntary and anonymous.

Ethical considerations

The study was conducted in accordance with the Declaration of Helsinki.

According to institutional regulations and national policies, formal ethical approval was not required for anonymous educational quality assurance surveys that did not collect identifiable personal information.

Prior to participation, respondents were informed about the purpose of the study and their right to withdraw at any time. Submission of the completed questionnaire was considered informed consent.

Questionnaires

Two separate questionnaires were developed specifically for this study to evaluate perceptions of the educational process among students and academic staff. No previously validated standardized questionnaire was used.

The questionnaires were developed by members of the Committee of Quality of Education (CQE) at the Faculty of Dental Medicine, Medical University – Sofia. Item generation was guided by institutional educational objectives, internal quality assurance reports, and relevant literature on medical and dental education, including competency-based educational frameworks and survey-based educational evaluations [2–4, 9–11].

Items were reviewed by experienced academic staff with expertise in undergraduate dental education, curriculum organization, and educational quality assurance to ensure content relevance, clarity, and consistency with the study objectives. Two language versions were used: Bulgarian and English, prepared by bilingual staff to ensure semantic equivalence. The questionnaires additionally underwent internal review within the CQE before administration to improve consistency and comprehensibility. Formal forward–backward translation validation was not performed.

Student questionnaire

The student questionnaire included 20 questions organized into two sections: Teaching and Learning and Educational Outcomes (Table 1).

The questionnaire assessed self-reported lecture attendance, motivation and engagement, perceptions regarding practical lessons, individualized support, understanding of educational objectives, and assessment preferences. Bulgarian-speaking and international students follow the same overall curriculum structure, learning objectives, and assessment framework; however, teaching activities are conducted in separate language tracks. Both tracks are taught by the same academic departments and are expected to meet the same educational standards.

Academic staff questionnaire

The academic staff questionnaire included 17 questions organized into two sections: Teaching and Learning and Educational Outcomes (Table 2).

The questionnaire assessed perceptions regarding student attendance, teaching methods, educational organization, individualized support strategies, and assessment approaches.

Questionnaire development and reliability assessment

Most questionnaire items were analyzed individually as descriptive single-item measures. Additionally, three questionnaire items related to motivation and engagement during lectures/practical lessons, additional independent work, and additional practical training were analyzed together as a composite indicator of student engagement.

Cronbach's alpha coefficient was calculated to evaluate internal consistency reliability of the three-item composite measure. Cronbach's alpha is a commonly used measure of internal consistency that assesses the extent to which multiple items evaluate related aspects of the same construct [12].

The obtained Cronbach's alpha values demonstrated acceptable internal consistency for exploratory educational research: Bulgarian students, $\alpha = 0.71$; international students, $\alpha = 0.72$; academic staff, $\alpha = 0.69$.

Table 1 Student questionnaire items and response options used to evaluate perceptions of teaching, learning, and assessment

Section	Question No.	Question	Answer Options
Teaching and Learning	1.1	Do you attend lecture courses?	Yes, all of them; Only those directly related to dental education; Only those where attendance is regularly monitored; I do not attend lecture courses
Teaching and Learning	1.2	Why do you attend the lecture course?	I receive useful information for the exam; I understand the material more easily; The material is presented in a systematic manner; Due to the lecturer's presentation style; There are interesting discussions between the lecturer and students; Because there is no textbook for the respective discipline; Due to attendance checks
Teaching and Learning	1.3	Does the organization of practical lessons meet your expectations? If not, please explain why.	Yes; No; Other (please specify)
Teaching and Learning	1.4	Do you understand and accept the objectives of the lectures and practical lessons?	Yes, I understand the overall framework, importance of subjects, and objectives (I study strategically); Yes, I understand subject objectives, but sometimes do not see how specific lectures/lessons contribute; Yes, I understand current lecture objectives but lack the overall perspective and application; No, I rely on syllabi and lecturer requirements to achieve high results; No, I am not aware of the objectives and/or do not perceive them as my own
Teaching and Learning	1.5	For what reasons do you most often miss lectures and practical lessons?	Medical/family reasons; Negative attitude toward a subject; Negative attitude toward a lecturer; No justified reason / not motivated / not prepared; I do not miss lectures or practical lessons
Teaching and Learning	1.6	To what extent do lecturers consider your interests and abilities?	They do not consider them at all; 1; 2; 3; 4; 5; They fully consider them
Teaching and Learning	1.7	How would you define your level of motivation and engagement in the learning process?	Low / Medium / High – during lectures and practical lessons; Low / Medium / High – additional independent work (projects, reports, research); Low / Medium / High – additional practical training
Teaching and Learning	1.8	Which of the following are used to provide an individualized approach to you?	Lecturers take into account my learning style; Additional adapted learning materials are provided; I receive individual support and attend consultations when needed; Lecturers participate in planning and support my development; I do not receive an individualized approach (lack of time / lecturers do not know students well)
Teaching and Learning	1.9	Do you participate in competitions, scientific forums, and similar activities?	Yes – FDM activities; Yes – MU-Sofia activities; Yes – Ministry of Health / Ministry of Education activities; Yes – national/international projects; Yes – private sector activities; No, not interested; No, not sufficiently prepared
Teaching and Learning	1.10	What skills do you acquire during practical lessons at FDM?	Patient communication; Assessment of patient needs; Discipline-specific practical skills; Development of a treatment plan; Interpretation of theory and correct diagnosis
Teaching and Learning	1.11	Have you experienced significant delays in receiving consultation from a supervisor during practical lessons?	No; Yes, rarely, due to lecturer being engaged with another student; Yes, often, due to lecturer being engaged with another student; Regularly, without justified reason (in my opinion)
Teaching and Learning	1.12	What innovations are you introduced to during lectures/practical lessons?	Innovations in practical work; Innovations in theoretical scientific knowledge; Technological innovations
Educational Outcomes	2.1	Is the preparation provided by FDM sufficient for ongoing tests, colloquia, semester, and state examinations?	Yes; No, but additional consultations are available; No, additional courses are needed; No, additional materials beyond the main textbook are needed
Educational Outcomes	2.2	What is the main reason for your need for additional preparation?	The material is extensive and time is insufficient; I do not study systematically; I do not understand the material due to teaching methods
Educational Outcomes	2.3	How do you assess the difficulty of the different forms of assessment?	Easy / Moderately difficult / Difficult beyond my abilities / Very difficult – ongoing tests; stop-tests; colloquia; semester exams; state exams; practical exams; completion of practical requirements
Educational Outcomes	2.3.1	Which format of ongoing assessment most reflects your knowledge and skills?	Test-based examination; Oral examination; Practical examination
Educational Outcomes	2.3.2	Which format of ongoing assessment do you consider most objective and would prefer?	Test-based examination; Oral examination; Practical examination
Educational Outcomes	2.4	Were you informed in advance about the format and content of the assessment?	Yes; No
Educational Outcomes	2.5	To what extent did the exam content reflect the course material?	Not at all; 1; 2; 3; 4; 5; Very accurately
Educational Outcomes	2.6	How would you evaluate the overall difficulty of test-based examinations?	Easy; Easy, depending on department; Difficult; Difficult, depending on department; I have not taken a test-based examination

Table 2 Academic staff questionnaire items and response options used to evaluate perceptions of teaching, learning, and assessment

Section	Question No.	Question	Answer Options
Teaching	1.0	I am familiar with:	The requirements in the curriculum/program of the respective specialty/discipline and I follow them strictly; The requirements in the curriculum/program of the respective specialty/discipline and I follow them as I consider necessary depending on the students' level; The requirements in the curriculum/program of the respective specialty/discipline and I do not achieve them because I do not consider them accurate and precise
Teaching	1.1	The average attendance at the lectures/practical sessions I conduct is:	Below 50%; Between 50% and 75%; Between 75% and 90%; There are never absent students
Teaching	1.2	In your opinion, why do students attend your lectures/practical sessions?	You provide useful information for the exam; You provide systematized information; You present the material in an interactive way; Interesting discussions take place between you and the students; There is no textbook for the respective discipline; Due to assessments/checks
Teaching	1.3	Do you believe that the organization of practical sessions meets students' expectations?	Yes; No; I cannot assess
Teaching	1.3.1	What innovative teaching methods do you apply to meet students' individual needs?	Presentation and analysis of real clinical cases from practice (live); Presentation and analysis of new technical achievements in patient treatment; Presentation and analysis of new technologies in patient treatment; I use presentations; I use short videos/films; I work using classical methods – strictly academic approach; Other
Teaching	1.4	In your opinion, do students understand and accept the objectives of the lectures and practical sessions?	Yes, they are aware of the overall framework, the importance of individual subjects, and the set objectives; Yes, they are aware of the objectives of the subjects, but sometimes they do not understand how specific lectures and practical sessions contribute; Yes, they understand the objectives of the current lectures and practical sessions, but they lack the overall picture and practical application; No, they rely mainly on syllabi and lecturer requirements in order to achieve high results; No, they are not aware of the objectives and/or do not perceive them as their own goals
Teaching	1.5	To what extent do you consider students' interests and abilities?	I do not consider them; 1; 2; 3; 4; 5; I fully consider them
Teaching	1.6	How would you assess students' level of motivation and engagement in the learning process?	Work during lectures and practical sessions (Low/Medium/High); Additional independent work – projects, reports, research (Low/Medium/High); Additional practical training (Low/Medium/High)
Teaching	1.7	Which of the following do you use for an individualized approach to students?	I take into account their learning style; I provide additional adapted learning materials; I provide individual support and consultations when difficulties arise; I participate in planning and supporting the development of high-achieving students; I participate in planning and supporting the development of students with learning gaps/deficiencies; I do not provide an individualized approach
Teaching	1.8	What skills do you develop in students beyond the curriculum during practical sessions at FDM?	Communication with the patient; Assessment of patient needs; Practical skills related to the specific discipline; Development of a treatment plan; Ability to interpret learned theory and make an accurate diagnosis; I do not conduct practical sessions
Teaching	1.9	Have you ever significantly delayed a requested consultation during a practical session?	No; Yes, but rarely, due to engagement with another student; Yes, often, due to engagement with another student; Yes, due to other professional obligations
Educational Outcomes	2.1	Is the preparation you provide sufficient for ongoing tests, colloquia, semester, and state exams?	Yes; No, but additional sessions and consultations are available; No, additional courses in certain disciplines are necessary; No, additional materials beyond the main textbook are necessary
Educational Outcomes	2.2	In your opinion, what is the main reason for the need for additional preparation?	Insufficient time for preparation (Main/Secondary/Additional); Students do not study systematically (Main/Secondary/Additional); The volume of study material is excessive for students' capabilities (Main/Secondary/Additional); The time distribution of disciplines is not balanced in terms of difficulty (Main/Secondary/Additional); Lack of balance in the volume of material during teaching (Main/Secondary/Additional)
Educational Outcomes	2.3	Do you consider tests to be a preferred form of assessment?	Yes, lecturers prefer it; Yes, students prefer it; Yes, it is appropriate for both parties; No
Educational Outcomes	2.3.1	How do you formulate / would you formulate your test questions?	Based on lecture material (predominantly theoretical); Based on lecture material and recent developments discussed during lectures; Based on material acquired during practical sessions (predominantly practical); Based on progressive development within practical sessions; Based on a balance between theory and practice; I use the department's existing question bank
Educational Outcomes	2.4	Do you inform students in advance about the format and content of the different forms of knowledge assessment?	Yes; No
Educational Outcomes	2.5	To what extent is the examination format aligned with the taught material in its entirety?	Not at all; 1; 2; 3; 4; 5; Very precisely aligned

Table 3 Students' self-reported lecture attendance and academic staff estimates of attendance (Question 1.1)

Group	All lectures	Lectures related to dental education	Only monitored lectures	Did not attend
Bulgarian students ($n=397$)	193 (48.6)	175 (44.1)	29 (7.3)	0 (0)
International students ($n=122$)	41 (33.6)	68 (55.7)	12 (9.8)	1 (0.9)
Academic staff estimates ($n=57$)	12 (21.1)	34 (59.6)	10 (17.5)	1 (1.8)

For 5-point response scales, higher values indicated greater agreement or stronger perceived presence of the assessed characteristic.

Data analysis

Data were analyzed using SPSS version 29.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics are presented as frequencies (n) and percentages (%).

Comparisons between respondent groups were performed using Pearson's chi-square test (χ^2) for categorical variables. All statistical tests were two-tailed, and statistical significance was set at $p<0.05$.

For contingency tables containing cells with expected frequencies below 5, Fisher's Exact test was applied where appropriate to minimize violations of chi-square test assumptions. Fisher's Exact test was specifically considered for analyses involving low-frequency response categories, including the alignment ratings presented in Table 12.

Statistical comparisons were interpreted at the level of the overall contingency table rather than as isolated comparisons between individual response categories. Therefore, statistically significant findings indicate overall differences between respondent groups across response distributions.

Multiple-response questions were analyzed accordingly; therefore, percentages may exceed 100% because respondents could select more than one answer option.

Because the study had an exploratory cross-sectional design, no formal correction for multiple comparisons was applied. Findings should therefore be interpreted cautiously and primarily as exploratory observations intended to identify broader educational trends and perceptions.

Results

Participant response rates

Completed questionnaires were obtained from 397 Bulgarian students, 122 international students, and 57 academic staff members. Response rates were approximately 98% among Bulgarian students, 30% among international students, and 93% among academic staff. The response rate among international students was therefore substantially lower than among Bulgarian students and academic staff.

Teaching and learning

Students' self-reported lecture attendance

Students' self-reported lecture attendance differed between Bulgarian and international students. Most respondents reported attending lectures directly related to dental education, whereas complete attendance across all lectures was less frequently reported (Table 3). Academic staff estimates of student attendance were generally consistent with students' self-reports. Overall comparison between respondent groups: $\chi^2 = 12.3$, $p<0.001$.

Self-reported reasons for lecture attendance

Students most commonly reported attending lectures because they considered them useful for examination preparation and because lectures facilitated understanding of the material. Lecturer presentation style and lack of textbooks were also frequently reported. Academic staff more frequently perceived structured presentation of content, organization of information, and classroom discussions as important factors influencing lecture attendance and student engagement.

Although several response categories overlapped between the student and academic staff questionnaires, some response options differed conceptually between the two instruments. Consequently, comparisons between students' self-reported motivations and academic staff perceptions should be interpreted cautiously and primarily as exploratory comparisons reflecting broader educational perspectives rather than directly equivalent constructs (Table 4). Overall comparison between respondent groups: $\chi^2 = 10.8$, $p=0.001$.

Perceptions regarding whether practical lessons meet expectations

Most students reported that the organization of practical sessions generally met their expectations, although international students reported lower agreement compared with Bulgarian students (Table 5). Academic staff responses were generally positive; however, a considerable proportion indicated that they could not assess students' perceptions. Overall comparison between respondent groups: $\chi^2 = 7.6$, $p=0.022$.

Self-reported understanding of educational objectives

Most students reported understanding the objectives of lectures and practical lessons, although some respondents indicated partial understanding or reliance on syllabi and lecturer requirements (Table 6). Overall comparison between respondent groups: $\chi^2 = 13.1$, $p<0.001$.

Perceived motivation and engagement in the learning process

Students generally perceived their level of motivation and engagement during lectures and practical lessons

Table 4 Self-reported reasons for lecture attendance and academic staff perceptions of attendance motivation (Question 1.2)

Reason	Bulgarian students (*n* = 397)	International students (*n* = 122)	Academic staff perception (*n* = 57)
Useful for exam preparation	261 (65.7)	66 (54.1)	39 (68.4)
Easier understanding of material	136 (34.3)	33 (27.0)	18 (31.6)
Systematic presentation	105 (26.4)	17 (13.9)	44 (77.2)
Lecturer presentation style	116 (29.2)	27 (22.1)	18 (31.6)
Classroom discussions	25 (6.3)	9 (7.4)	30 (52.6)
No textbook available	118 (29.7)	53 (43.4)	6 (10.5)
Attendance checks	173 (43.6)	54 (44.3)	23 (40.4)

Not all response options were directly equivalent between the student and academic staff questionnaires; comparisons should therefore be interpreted cautiously

Table 5 Perceptions regarding whether practical lessons meet expectations (Question 1.3)

Group	Yes	No	Cannot assess / Other
Bulgarian students (*n* = 397)	274 (69.0)	73 (18.4)	50 (12.6)
International students (*n* = 122)	70 (57.4)	22 (18.0)	30 (24.6)
Academic staff (*n* = 57)	35 (61.4)	6 (10.5)	16 (28.1)

Table 6 Self-reported understanding of lecture and practical lesson objectives (Question 1.4)

Group	Overall strategic understanding	Understand subject but partial understanding	Understand current objectives only	Rely on syllabi	Not aware
Bulgarian students (*n* = 397)	152 (38.3)	166 (41.8)	40 (10.0)	38 (9.6)	1 (0.3)
International students (*n* = 122)	39 (32.0)	43 (35.2)	17 (13.9)	22 (18.0)	1 (0.9)
Academic staff (*n* = 57)	22 (38.6)	13 (22.8)	16 (28.1)	3 (5.5)	3 (5.0)

Table 7 Self-perceived motivation and engagement in the learning process (Question 1.7)

Activity	Bulgarian students (*n* = 397)	International students (*n* = 122)	Academic staff perception (*n* = 57)
High motivation during lectures/practical lessons	184 (46.3)	48 (39.3)	21 (36.8)
High motivation for independent work	109 (27.5)	44 (36.1)	6 (10.5)
High motivation for additional practical training	134 (33.7)	43 (35.2)	8 (14.0)

as higher than their engagement in independent work or additional practical training (Table 7). Academic staff generally perceived student engagement levels as lower compared with students' self-assessments. Overall comparison between respondent groups: $\chi^2 = 6.1$, $p = 0.013$.

Perceived individualized teaching approach

More than half of the students reported not receiving an individualized educational approach (Table 8). Academic staff reported using consultations, adapted materials, and individualized support strategies more frequently than students perceived receiving them. Overall comparison between respondent groups: $\chi^2 = 22.7$, $p < 0.001$.

Students' perceptions of skills developed during practical lessons

Students reported that practical lessons contributed to the development of discipline-specific practical skills, patient communication abilities, treatment planning, and interpretation of theoretical knowledge for diagnostic reasoning (Table 9). Overall comparison between respondent groups: $\chi^2 = 4.6$, $p = 0.032$.

Educational outcomes

Perceived adequacy of preparation for assessments

Bulgarian students more frequently reported that the preparation provided by the Faculty of Dental Medicine was sufficient for examinations compared with international students. Academic staff generally perceived the provided preparation as sufficient (Table 10). Overall comparison between respondent groups: $\chi^2 = 10.5$, $p = 0.001$.

Preferred assessment formats

Students generally reported preferring oral and practical forms of assessment, whereas academic staff more frequently preferred test-based examinations (Table 11). Overall comparison between respondent groups: $\chi^2 = 16.7$, $p < 0.001$.

Perceived alignment between examination content and course material

Students generally perceived moderate to high alignment between examination content and the material covered during the course, whereas academic staff perceived the

Table 8 Perc ach (Question 1.8 / Question 1.7 for academic staff)

Approach	Bulgarian students (*n* = 397)	International students (*n* = 122)	Academic staff (*n* = 57)
Learning style considered	27 (6.8)	8 (6.5)	4 (7.0)
Additional materials provided	58 (14.6)	20 (16.4)	10 (17.5)
Individual support / consultations	35 (8.8)	18 (14.8)	32 (56.1)
Lecturer supports development	57 (14.4)	13 (10.7)	7 (12.4)
No individualized approach	220 (55.4)	63 (51.6)	4 (7.0)

Table 9 Students' perceptions of skills developed during practical lessons (Question 1.10)

Skill	Bulgarian students (*n* = 397)	International students (*n* = 122)	Academic staff (*n* = 57)
Practical skills	332 (83.6)	103 (84.4)	40 (70.2)
Communication with patients	198 (49.9)	54 (44.3)	42 (73.7)
Patient assessment	163 (41.1)	46 (37.7)	31 (54.5)
Treatment planning	140 (35.3)	51 (41.8)	41 (71.9)
Diagnostic reasoning / theory interpretation	181 (45.6)	64 (52.5)	42 (73.7)

Table 10 Perceived adequacy of preparation for assessments (Question 2.1)

Group	Sufficient	Additional consultations	Additional courses	Extra materials
Bulgarian students (*n* = 397)	182 (45.8)	64 (16.1)	38 (9.6)	113 (28.5)
International students (*n* = 122)	36 (29.5)	20 (16.4)	15 (12.3)	51 (41.8)
Academic staff (*n* = 57)	40 (70.2)	10 (17.5)	2 (3.5)	5 (8.8)

Table 11 Preferred assessment formats (Question 2.3.2)

Format	Bulgarian students (*n* = 397)	International students (*n* = 122)	Academic staff (*n* = 57)
Oral examination	189 (47.6)	31 (25.4)	7 (12.3)
Practical examination	126 (31.7)	51 (41.8)	2 (3.5)
Test-based examination	82 (20.7)	44 (35.8)	31 (54.4)

alignment more positively (Table 12). Overall comparison between respondent groups: $\chi^2 = 14.2$, $p = 0.006$.

Discussion

The present study explored perceptions of teaching, learning, and assessment among students and academic staff at the Faculty of Dental Medicine, Medical University – Sofia, within the context of a multilingual undergraduate dental education program.

The findings demonstrated both similarities and discrepancies between students' and academic staff's perceptions regarding lecture attendance, motivation and engagement, individualized educational support, practical training, and preferred forms of assessment. These findings add evidence regarding educational experiences in Eastern European dental education environments and highlight the importance of aligning educational strategies with contemporary competency-based educational frameworks.

Contemporary dental education increasingly emphasizes student-centered learning, integration of theoretical and clinical knowledge, and development of professional competencies extending beyond purely technical skills [1–4]. The ADEE Graduating European Dentist framework specifically highlights the importance of communication skills, professionalism, patient-centered care, clinical reasoning, and lifelong learning competencies within undergraduate dental curricula [2, 3]. In this context, evaluating educational quality requires consideration not only of curriculum structure but also of students' perceptions of teaching effectiveness, educational organization, and assessment practices.

Although institutional educational standards and curricula are unified across departments, teaching approaches and the implementation of interactive educational methods may vary between lecturers and disciplines. Such variability may include differences in the use of clinically oriented examples, interactive discussions, formative questioning, and reflective educational activities. The educational literature has consistently demonstrated that reflection and reflective practice may support learning processes and professional development in health professions education [13].

Our results indicate that approximately half of the students at the Faculty of Dental Medicine reported attending all lectures, with higher interest shown for core dental disciplines perceived as more relevant to professional development. Students and academic staff differed in their interpretation of the factors influencing attendance. Students primarily associated attendance with exam preparation, clarity of lecture delivery, ease of understanding, and lack of a textbook, whereas academic

Table 12 Perceived alignment between examination content and course material (Question 2.5)

Rating (1–5)	Bulgarian students (*n* = 397)	International students (*n* = 122)	Academic staff (*n* = 57)
1	10 (2.5)	8 (6.6)	0 (0)
2	31 (7.8)	27 (22.1)	1 (1.8)
3	148 (37.3)	50 (41.0)	6 (10.5)
4	167 (42.1)	28 (23.0)	14 (24.6)
5	41 (10.3)	9 (7.4)	36 (63.2)

The response scale ranged from 1 to 5, with higher scores indicating stronger perceived alignment between examination content and course material. Fisher's Exact test was additionally considered because of low expected frequencies in several response categories

staff emphasized structured content delivery, relevance for examinations, and opportunities for discussion.

Regular lecture attendance and active participation are commonly associated with improved academic performance, motivation, and educational engagement in higher education [10, 11]. In the present study, students most frequently reported attending lectures because they considered them useful for examination preparation and because lectures facilitated understanding of the material. Students are more likely to engage when educational content is clearly connected to their future professional practice and clinical identity. Therefore, emphasizing clinical relevance during theoretical teaching may support motivation and perceived value of lecture attendance.

These findings suggest differences between how students and academic staff perceive the educational value of lectures. Students may prioritize practical utility, examination preparation, and accessibility of information, whereas academic staff may place greater emphasis on structured learning and academic interaction. Similar differences between student and teacher perspectives have previously been reported in educational research [14].

An important finding of the present study was the discrepancy between students' and academic staff's perceptions regarding individualized educational support. More than half of the students reported not receiving an individualized educational approach, whereas academic staff frequently reported providing consultations, adapted educational materials, and individualized support.

This discrepancy may reflect differences in expectations, communication gaps, limited contact time, or structural challenges associated with large student groups and intensive clinical schedules. In multilingual educational environments, these challenges may become more pronounced due to differences in educational background, adaptation processes, and communication styles between local and international students.

The results regarding practical training are particularly relevant within competency-based dental education. Students reported that practical sessions contributed to the development of discipline-specific practical skills, patient communication, treatment planning, and diagnostic reasoning. Academic staff generally perceived development of these competencies even more positively.

These findings support the importance of practical and clinically integrated teaching approaches within undergraduate dental education. Recent systematic reviews have demonstrated that innovative educational models, including case-based learning, integrated clinical teaching, and technology-enhanced learning, may improve engagement and facilitate integration of theoretical and practical knowledge [4].

Differences between Bulgarian and international students were observed across several educational domains, including self-reported attendance, perceptions regarding adequacy of preparation, and preferred assessment formats. These differences may reflect variations in prior educational experience, adaptation to multilingual educational settings, cultural perceptions regarding assessment, and familiarity with competency-based educational systems.

International students more frequently reported requiring additional educational materials and demonstrated greater preference for practical and test-based assessments. These findings may suggest increased reliance on structured and standardized educational formats among students adapting to a foreign academic environment. Although international students may be expected to show high motivation because of their decision to study abroad, motivation may additionally be influenced by cultural expectations, language-related adaptation, unfamiliar assessment traditions, and different levels of integration into the academic community.

The findings related to assessment preferences are also important from a curriculum development perspective. Students generally reported preferring oral and practical forms of assessment, whereas academic staff more frequently preferred test-based examinations. Written examinations are commonly perceived as more objective and standardized, particularly in larger student cohorts. However, oral and practical examinations may better evaluate communication skills, clinical reasoning, and practical competence, which are central components of competency-based dental education [2, 3].

At the same time, structured competency-based assessment approaches, including problem-based learning

cases, rubric-based practical assessments, and clinically oriented exercises, may support not only evaluation of competencies but also the learning process itself. Therefore, balanced assessment strategies integrating objective testing with oral, practical, and competency-oriented evaluation approaches may provide a more comprehensive assessment of students' knowledge, clinical reasoning, communication abilities, and professional competencies.

The present findings also highlight the importance of transparency regarding assessment criteria and educational expectations. Students who clearly understand course objectives and assessment formats may demonstrate greater engagement and perceive educational processes as more equitable and supportive.

From a curriculum development perspective, strengthening alignment between teaching methods, learning objectives, and assessment formats may enhance student engagement and perceived fairness of evaluation procedures. Such alignment may additionally be facilitated through backward curriculum design approaches, where learning objectives, teaching activities, and assessment strategies are intentionally developed in an integrated manner [15].

Backward curriculum design approaches may further support alignment between learning objectives, teaching activities, and assessment strategies by ensuring that educational outcomes guide instructional planning and evaluation methods.

From an institutional perspective, continuous quality assurance processes and regular evaluation of educational practices remain essential components of curriculum development. Survey-based evaluations may provide valuable insight into strengths and challenges within the educational environment and support evidence-based improvements in teaching organization, communication, and assessment strategies.

Although the present study identified statistically significant differences between respondent groups, the findings should primarily be interpreted as exploratory educational observations rather than definitive causal relationships. The cross-sectional design and self-reported nature of the data limit causal interpretation.

Nevertheless, the study provides important insight into educational perceptions within a multilingual European dental education setting and contributes evidence regarding alignment between teaching, learning, and assessment practices in undergraduate dental education.

Limitations

Several limitations should be considered when interpreting the findings of the present study. First, the study was conducted at a single institution, which may limit the generalizability of the results to other dental schools and educational contexts.

Second, the study relied on self-reported questionnaire data rather than objective measures of attendance, engagement, or academic performance, which may introduce reporting bias. In addition, some questionnaire items used simplified response formats that may have reduced the level of detail captured in participants' responses.

Although formal forward–backward translation procedures were not performed for the Bulgarian and English versions of the questionnaire, efforts were made to ensure conceptual equivalence between the two language versions; however, this may still limit full cross-language comparability.

The study also had a lower response rate among international students compared with Bulgarian students and academic staff, which may have introduced response bias. This may reflect differences in academic integration, language-related factors, or engagement with institutional survey activities. Therefore, findings related to international students should be interpreted with caution.

Finally, the locally developed composite measure of motivation and engagement demonstrated acceptable internal consistency; however, it requires further validation in larger and more diverse populations. As the study had an exploratory design, no formal correction for multiple comparisons was applied, and the findings should therefore be interpreted accordingly.

Conclusion

The findings of this study provide insight into students' and academic staff's perceptions regarding teaching, learning, and assessment within dental education.

Although overall perceptions regarding educational quality and assessment alignment were moderate to positive, differences between respondent groups indicate opportunities to improve communication, individualized educational support, and assessment strategies.

The study adds evidence regarding educational experiences within a multilingual European dental education environment and may support curriculum development and institutional quality assurance processes.

Future multi-institutional studies and additional validation of the survey instruments are recommended to strengthen generalizability and support further development of competency-based dental education.

Acknowledgements
The authors would like to thank the students and academic staff of the Faculty of Dental Medicine, Medical University – Sofia, for their participation in this study.

Authors' contributions
M.M.-T. and Z.M. contributed to the conception and design of the study. M.M.-T. was responsible for study coordination and data collection. Z.M. performed the statistical analysis. Both authors contributed to data interpretation, manuscript drafting, and critical revision. Both authors approved the final version of the manuscript and agree to be accountable for all aspects of the work.

Funding
This research received no external funding.

Data availability
The datasets generated and/or analyzed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate
The study was conducted in accordance with the Declaration of Helsinki. According to national regulations and institutional policies of the Medical University – Sofia, ethical approval from an institutional review board (Scientific Research Ethics Committee of Medical University – Sofia) was not required for anonymous questionnaire-based studies conducted for educational quality assurance purposes in which no identifiable personal data are collected. The survey was carried out under the supervision of the Committee of Quality of Education (CQE) at the Faculty of Dental Medicine, Medical University – Sofia.
Participation in the study was voluntary and anonymous. Prior to completing the questionnaire, all participants were informed about the purpose of the study and their right to withdraw at any time. Submission of the completed questionnaire was considered informed consent to participate.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

Author details
[1]Department of Conservative Dentistry, Faculty of Dental Medicine, Medical University – Sofia, Sofia, Bulgaria
[2]Research Institute of Innovative Medical Science, Medical University Sofia, Sofia, Bulgaria
[3]Department of Dental, Oral and Maxillofacial Surgery, Faculty of Dental Medicine, Medical University – Sofia, Sofia, Bulgaria

Received: 22 April 2026 / Accepted: 18 June 2026
Published online: 24 June 2026

References

1. Rasmussen EL, Musaeus P. Subject matter changes in the dental curriculum: A scoping review of the last two decades. J Dent Educ. 2024;88(8):1101–14.
2. Field J, Vital S, Dixon J, Murphy D, Davies J. The Graduating European Dentist Curriculum Framework: A 7-year review. Eur J Dent Educ. 2025;29(1):155–61.
3. Field JC, Walmsley AD, Paganelli C, McLoughlin J, Szep S, Kavadella A, Manzanares Cespedes MC, Davies JR, DeLap E, Levy G, Gallagher J. The graduating European dentist: contemporaneous methods of teaching, learning and assessment in dental undergraduate education. Eur J Dent Educ. 2017;21(S1):28–35.
4. Pang X, Li L, Liu X, Wang Y, Yang B. Application of emerging teaching models in dental education: a systematic review and meta-analysis. Int Dent J. 2024;74(6):1185–96.
5. Chan WP, Wu TY, Hsieh MS, Chou TY, Wong CS, Fang JT, et al. Students' view upon graduation: a survey of medical education in Taiwan. BMC Med Educ. 2012;12:127.
6. Engida MA, Iyasu AS, Fentie YM. Impact of teaching quality on student achievement: Student evidence. Front Educ. 2024;9:1367317.
7. Kapanda GE, Muiruri C, Kulanga AT, Tarimo CN, Lisasi E, Mimano L, et al. Enhancing future acceptance of rural placement in Tanzania through peripheral hospital rotations for medical students. BMC Med Educ. 2016;16:1–9.
8. Wang W, Bi X, Zhu Y, Li X. Reforming teaching methods by integrating dental theory with clinical practice for dental students. PeerJ. 2020;8:e8477.
9. Welzant H, Schindler L, Puls-Elvidge S, Crawford L. Definitions of quality in higher education: A synthesis of the literature. High Learn Res Commun. 2011;5(3):2.
10. Rawlani SS, Rawlani SM, Lohe V, Bhowate R, Khubchandani MR, Chandak R. Perception of dental faculty and student regarding class attendance and final performance. J Educ Health Promot. 2018;7:153.
11. Kauffman CA, Derazin M, Asmar A, Kibble JD. Relationship between classroom attendance and examination performance in a second-year medical pathophysiology class. Adv Physiol Educ. 2018;42:593–8.
12. Cronbach LJ. Coefficient alpha and the internal structure of tests. Psychometrika. 1951;16(3):297–334.
13. Mann K, Gordon J, MacLeod A. Reflection and reflective practice in health professions education: a systematic review. Adv Health Sci Educ Theory Pract. 2009;14(4):595–621.
14. Ralph T. Non-compliance as a substitute for voice. Res Pap Educ. 2021;36(2):176–95.
15. Wiggins G, McTighe J. Understanding by Design. Expanded. 2nd ed. Alexandria, VA: Association for Supervision and Curriculum Development; 2005.

Publisher's note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.