



MAGNET
Managerial And GovernAncE Enhancement through Teaching

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**INNOVATIONS AND TRENDS IN TEACHING
PEDIATRIC DENTISTRY AND HEALTH EDUCATION:
DEVELOPING FACULTY COMPETENCES IN HIGHER
EDUCATION FACULTY GUIDE**

Plovdiv, 2025

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EDUCATION FACULTY GUIDE**

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1. INTRODUCTION

1.1. Characteristics of the MAGNET Project

Ani Belcheva

This faculty guide has been developed for university lecturers as part of the international project “**Modernising Academic Governance and Management through Training**” (MAGNET).

The objectives of the MAGNET project are “*to encourage higher education teaching staff to collaborate, share, and provide opportunities for continuous professional development and training; to foster a culture of lifelong learning and improvement; to promote innovation and creativity in teaching practices; and to support educators in addressing the challenges they face as part of their academic roles.*”

The activities of the MAGNET project aim to improve the quality and relevance of higher education provision, to emphasize the importance of learning and teaching as a core institutional mission, and to advocate for educational and teaching practices focused on student learning and success. The project is innovative in that it serves multiple purposes and diverse audiences, contributing to the modernization and sustainability of university teaching excellence.

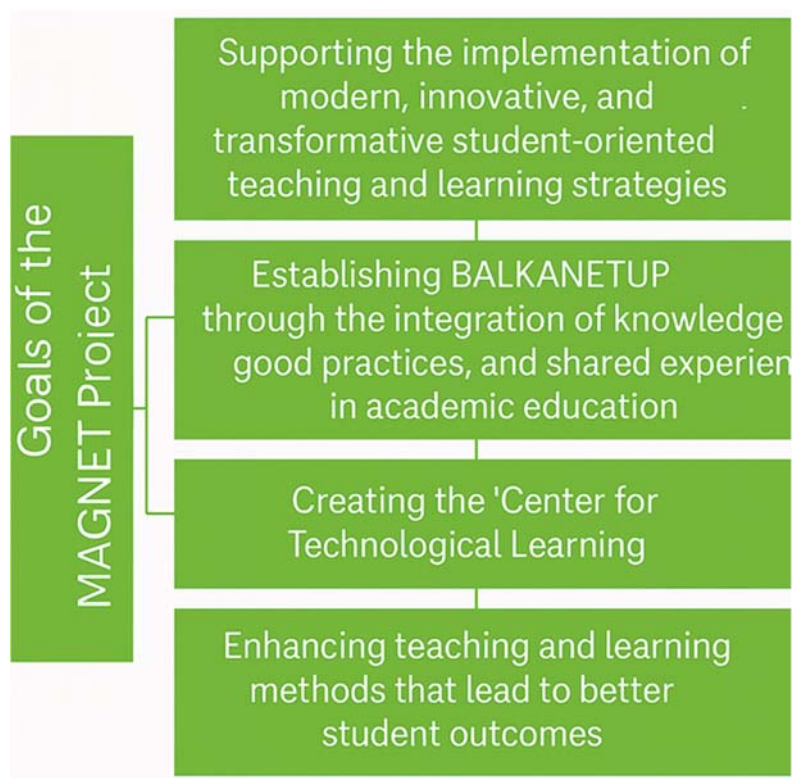


Fig. 1. Goals of the MAGNET Project

Results of the MAGNET Project

The outcomes of the **MAGNET Project** include:

- Supporting the implementation of modern, innovative, transformative, and student-centered teaching strategies in higher education institutions across the Western Balkans;
- Establishing BALKAN-HEP through the integration of knowledge, best practices, and shared experience in academic educational processes;
- Creating Centers for Technological Learning (CTL) within universities;
- Launching an electronic network to support BALKANETUP;
- Enhancing teaching and learning methods that lead to improved student performance and outcomes.

University educators are expected to be willing to share their experience, remain open to continuous learning, and engage in experimentation with new methods, tools, and techniques within their teaching practice in higher education.

High-quality teaching in higher education is essential to meet the expectations of students who face the challenges of lifelong learning, changing demographics, evolving social dynamics of national and global interdependence, health and safety concerns, and economic shifts toward a knowledge-based economy, green agenda, and sustainable labor market in the 21st century.

For generations, university lecturers in the Western Balkans — often without formal pedagogical training — have been appointed based on research achievements or administrative expertise to teach within their academic disciplines. The absence of structured training in higher education pedagogy has resulted in instructors teaching students much as they themselves were taught. However, this traditional approach no longer meets the demands of the transition toward Competence-Based Higher Education (CBHE) — an outcomes-oriented paradigm for designing, delivering, assessing, and revising university curricula based on clearly defined competence frameworks.

The competence-based approach in contemporary higher education requires a shift in educational focus - from mere transmission of knowledge to the mastery of key competences and the development of problem-solving abilities. This model emphasizes integrated interdisciplinary collaboration, practical application of learning, outcome-oriented design, and the implementation of innovative pedagogical practices.

University faculty should be familiar with the nature and significance of the competence-based approach as a guiding principle in higher education, as articulated in the official document of the Ministry of Education and Science (2025), “Competence-Based Approach.”

The document defines competences as “a dynamic combination of knowledge, skills, attitudes, and values acquired through the learning process. They are primarily related to personal behavior — not knowledge or skills in isolation, but appropriate behaviors demonstrated in specific learning situations and required for achieving results within a given activity or professional role.”

In the broader European context, the document “Key Competences for Lifelong Learning: European Reference Framework” (European Commission, 2018) identifies competences as the foundation for employability, personal development, active citizenship, and social inclusion. The framework aims to:

- Identify and define the key competences necessary for personal fulfillment and professional adaptability;
- Provide a European reference tool for guiding educational policy and practice;
- Support the development of competences through lifelong learning.

According to the framework, key competences are universal skills applicable to all ages and forms of education. They strengthen the connection between education and the labor market, promote academic and professional mobility, and foster sustainable learning capacity throughout life.

At the core of the framework lies the concept of a comprehensive competence complex necessary for personal development, active citizenship, social inclusion, and employability in the 21st century. Among these are the so-called soft skills — initiative, creativity, critical thinking, teamwork, problem-solving, self-reflection, and responsibility (European Commission, 2018).

An integral component of the competence-based approach is also the European Framework for the Digital Competence of Educators (DigCompEdu), which identifies six key areas of digital competence related to pedagogical use of technology, digital content creation, assessment, and learner support (European Digital Education Hub, 2025). This framework functions as a self-assessment and professional development tool, reflecting the growing integration of digitalization within university teaching and learning practices.

1.2. Academic Context and Rationale

Ani Epitropova

This faculty guide is designed to support university lecturers in enhancing their pedagogical approaches in line with the contemporary requirements of competence-based higher education. It employs the terms *pediatric dentistry* and *health education*, both of which

refer to distinct academic disciplines integrated into various professional fields within Bulgarian higher education.

Pediatric dentistry represents a core clinical and educational discipline included in the curricula of all faculties of dental medicine in the country. Its purpose is to equip future dental practitioners with specialized knowledge, skills, and professional competences necessary for the diagnosis, prevention, and treatment of oral diseases in children. In addition, the discipline fosters the development of ethical, communicative, and social skills essential for effective interaction with children and their parents, as well as for recognizing the importance of early prevention as a key factor in promoting public health.

Health education, on the other hand, is an interdisciplinary academic subject taught in the pedagogical faculties of higher education institutions and plays a vital role in the preparation of future teachers. In accordance with the regulations of the Ministry of Education and Science, health education is a mandatory elective course included in the study plans of students training to become teachers at the primary and lower secondary levels. Its purpose is to develop in future educators the knowledge, attitudes, and skills necessary to promote healthy lifestyles, prevent diseases, and foster the personal and social well-being of children and students.

Within this guide, the two disciplines are examined through their shared educational and public health functions — as complementary areas of academic knowledge aimed at developing professional competences related to health care, prevention, and the sustainable advancement of health culture.

This integrative approach promotes collaboration across academic fields within higher education, uniting medical and pedagogical perspectives within a common educational framework. It highlights the importance of interfaculty cooperation, in which the university lecturer serves as a link between scientific knowledge, clinical practice, and educational innovation, contributing to the cultivation of a holistic culture of health, prevention, and well-being.

1.3. How to Use This Guide

Ani Epitropova

This Faculty Guide on Educational Innovations and Trends in Teaching Pediatric Dentistry and Health Education has been developed as a resource for self-directed learning and professional development of university lecturers. Its purpose is to support the enhancement of academic teaching practice through the integration of innovative methods, digital tools, and an interdisciplinary approach to university education.

Learning Objectives

1. To provide up-to-date knowledge and practical strategies for improving teaching in the fields of pediatric dentistry and health education.
2. To support the development of competences related to effective instruction in lectures, seminars, and practical sessions.
3. To promote the use of contemporary technologies – including Augmented Reality (AR) and Artificial Intelligence (AI) – to enhance the quality of learning and teaching.
4. To engage educators with evidence-based approaches and European educational policies aligned with the competence-based model and the digital transformation of higher education.

Structure of the Content

The guide is organized into three main thematic modules:

- Interactive Lecture Teaching – focusing on engaging students in large-group settings through the use of multimedia resources, critical thinking, and modern presentation platforms.
- Effective Design of Seminar and Practical Exercises – emphasizing small-group teaching, the development of professional and social competences, and the integration of AR/VR technologies into the learning process.
- Assessment in Academic Settings – presenting best practices and new approaches in assessment, including the use of AI and digital tools to ensure more objective and effective feedback.

Recommendations for Using the Guide

The materials can be used flexibly – either for systematic study following the modules in sequence or for targeted reference and preparation. Each module includes a theoretical overview, practical guidance, reflection questions, and additional resources for extended reading.

Educators are encouraged to maintain a professional development journal to record ideas, questions, successful practices, and personal insights that emerge while working with the guide. This reflective practice supports deeper learning, promotes critical awareness, and facilitates the transfer of acquired knowledge into real teaching contexts.

Flexibility and Autonomous Learning

Considering the demanding academic workload of university lecturers, this guide is designed to be highly adaptable and user-centered. It can be used according to individual needs, pace, and availability – at any time and place – both for independent study and as a foundation for collegial learning or internal faculty training sessions.

CHAPTER ONE

2. Interactive Lectures

Session Overview

This session focuses on enhancing the teaching skills of academic staff by introducing modern techniques for engaging, motivating, and stimulating active participation among large groups of students. It explores methods for creating interactive lectures, effectively integrating multimedia and digital resources, and encouraging student participation. The session includes case studies and applications from dental and health education that demonstrate how to conduct impactful sessions in lecture halls. Examples are provided for developing presentations using Sway, Office 365, and Canva.

Expected Learning Outcomes

- To develop an understanding of the dynamics of large student groups.
- To acquire techniques for engaging and sustaining student interest during lectures.
- To create and use multimedia and digital resources that promote active student participation.

Structure of the Session

- 2.1. Techniques and Strategies for Conducting Engaging Lectures with Large Student Groups
- 2.2. Understanding the Dynamics of Large Student Groups in Lecture Settings
- 2.3. Practical Guidelines: Using Sway and Office 365 for Effective Presentations

2.1. Techniques and Strategies for Conducting Interactive Lectures with Large Student Groups

Ani Belcheva

The Faculty of Dental Medicine at the Medical University of Plovdiv has made significant progress in enhancing the quality of its educational programs, maintaining high standards, and ensuring uncompromising academic excellence. Teaching in the fields of dental medicine and health education is evolving at an unprecedented pace, driven by technological advancement and innovation.

The Medical University of Plovdiv is recognized for setting high standards within its educational structure, continually striving for excellence in dental education. The University's long-standing commitment to high-quality education and patient care, combined with its

emphasis on research and development, ensures that students are well-prepared to meet the challenges of modern healthcare.

Ongoing institutional efforts to innovate and adapt to emerging educational trends and technologies in dentistry and other medical fields demonstrate the University's commitment to maintaining academic quality and relevance.

Academic Standards – Medical University of Plovdiv

Academic Standards – Department of Pediatric Dentistry

The University aims not only to provide high-quality education for its students but also to create opportunities for continuous professional development for university lecturers. Each module completed brings educators one step closer to becoming leaders in dental education. The knowledge gained here is intended to help them make a tangible difference in their teaching practice and in their students' achievements.

Understanding the dynamics of large groups in dental and health education involves recognizing and addressing various factors that influence the effectiveness of teaching and learning in lecture settings.

1. Engagement Strategies

In the context of lectures for large groups in dental and health education, it is crucial to adapt engagement strategies that effectively develop both general and specific competences. Although hands-on activities may be challenging to implement during large lectures, interactive elements such as case studies and discussions can be successfully employed to achieve educational goals.

Case studies offer an effective method for developing general competences such as critical thinking and problem-solving skills. By presenting realistic patient scenarios, students can engage in analytical discussions that enable them to apply theoretical knowledge in practical situations.

Discussions provide a platform for students to explore and exchange key ideas, enhancing communication skills and promoting deeper understanding of the subject matter. Through structured group discussions, learners can share opinions, exchange solutions, and strengthen their ability to formulate and defend their viewpoints.

Modern research confirms the importance of an interactive approach in lecture-based teaching. According to Klein et al. (2023), the *active lecture*, characterized by engaging and interactive teaching, outperforms the traditional model in maintaining attention, increasing participation, and improving knowledge retention. The analysis of both quantitative and qualitative data reveals clear student preference for active lectures due to perceived benefits

such as more effective learning, greater interaction, focused attention, varied activities, discussions, and multimedia use. However, the authors note that traditional lectures can still be effective when well-structured, systematically delivered, and supported by visual aids and clearly defined learning objectives.

While hands-on activities may not always be feasible in large lecture settings, instructors can integrate interactive demonstrations or simulations to enhance learning outcomes. Virtual simulations or multimedia presentations can provide immersive learning experiences that replicate clinical scenarios, allowing students to practice clinical decision-making and strengthen competences related to dental and health education.

Following the principles of active learning, the instructor's goal is to create a continuous cycle of activity and feedback that enables students to apply their knowledge, develop critical thinking, and build higher-order cognitive skills. Models such as the flipped classroom and team-based learning (TBL) allow lecture time to be used for analysis, discussion, and problem-solving instead of one-way content delivery.

Implementing interactive methods such as group case analysis, audience response questions, and the "Think-Pair-Share" technique promotes increased concentration and engagement. Studies indicate that the use of student response systems (clickers) and short, engaging activities significantly helps maintain attention during lectures — a finding applicable across all academic disciplines (Bunce, Flens, & Neiles, 2010).

By employing these engagement strategies, educators can create a dynamic and interactive lecture environment that fosters the development of both general and specific competences in dental education. Through active participation in case studies, discussions, and interactive demonstrations, students acquire the skills and knowledge essential for success in their future dental careers.

Reflective Practice

Explain how you can incorporate case studies and the discussion of clinical scenarios into your lecture to encourage critical thinking and the development of problem-solving skills.

2. Diverse Learning Styles

In a university setting, it is essential to recognize and adapt teaching methods to accommodate different learning styles in order to ensure the effective development of competences. The term *learning styles* encompasses the various preferences and ways in which students perceive, process, and apply information. In academic literature, four primary types are most commonly distinguished:

- **Visual style** – learners prefer graphics, diagrams, tables, images, and other visual elements that help them organize and retain content.
- **Auditory style** – students learn best through listening to explanations, participating in discussions, oral elaborations, or audio materials.
- **Kinesthetic (tactile) style** – includes learners who learn most effectively through movement, experimentation, role-playing, and hands-on activities.
- **Multimodal style** – combines elements of different categories, with learners feeling most comfortable when they have access to varied learning methods.

Recognizing these styles enables instructors to apply more targeted strategies for engaging their audience. In the context of interactive lectures with large groups of students, this means integrating a variety of approaches — visual presentations, oral discussions, practical demonstrations, and case studies — as well as blended methods that create a balanced and stimulating learning environment. This increases the likelihood that all students, regardless of their preferred learning style, will be actively engaged and achieve sustainable mastery of the expected learning outcomes defined in the curriculum.

Reflective practice

Before proceeding, reflect on your past experiences attending lectures. Write down two positive and two negative characteristics related to the lecturer, the content, and the resources used.

3. Using Contemporary Technologies

Use multimedia presentations, online resources, and educational software to complement traditional lectures and make the material more engaging.

Presentation Software

Tools such as *PowerPoint*, *Keynote*, or *Google Slides* can help create engaging and visually appealing presentations. Incorporating multimedia elements such as videos, animations, and images can make lectures more dynamic and help illustrate complex concepts effectively.

Learning Management Systems (LMS)

Platforms such as *Canvas*, *Moodle*, or *Blackboard* serve as central hubs for learning materials, assignments, assessments, and discussions. They facilitate easy communication between instructors and students and provide access to resources at any time.

Interactive Polling and Quizzes

Use tools such as *Kahoot!*, *Poll Everywhere*, or the polling feature in *Zoom* to create interactive quizzes or surveys. These tools can increase student engagement, provide immediate feedback, and help assess understanding of the material in real time.

Collaborative Documents and Whiteboards

Platforms such as *Google Docs*, *Microsoft OneNote*, or *Miro* allow students to collaborate on notes, projects, or brainstorming activities in real time. This promotes teamwork and facilitates the sharing of ideas and feedback.

Video and Audio Content

Use platforms such as *YouTube*, *Vimeo*, or podcasts to integrate external video and audio resources that can enrich your lectures. Creating your own video content for *flipped classroom* models can also be beneficial, allowing students to engage with the lecture material at their own pace before class.

Digital Assessment

Utilize technology to administer tests, quizzes, and assignments. Digital assessments can provide instant feedback, support various question types (e.g., multiple choice, short answer, essays), and streamline the grading process.

Feedback and Survey Tools

Use tools such as Google Forms, Slido, and SurveyMonkey to collect feedback on your lectures, enabling you to adjust content, pacing, and teaching methods based on student input. More information on tools suitable for feedback can be found in the section on small-group teaching.

Two Examples of Interactive Lectures Presented through Contemporary Digital Applications — Sway, Canva, and Slido

The first example is the lecture “*Trauma to Permanent Teeth in Childhood*”, developed by Prof. Dr. Ani Belcheva and presented through the **Microsoft Sway** platform: <https://sway.cloud.microsoft/8vuxKvMQqL887WAY?ref=Link>

This lecture is an impressive illustration of how interactive multimedia formats can transform a traditional presentation into a dynamic, visually rich, and emotionally engaging learning experience. The use of **Sway** enables the seamless integration of text, images, videos, and diagrams, making the content easily comprehensible and memorable. The lecture stands out for its high level of scientific precision, visual aesthetics, and pedagogical effectiveness — a model of innovative academic design that successfully combines professional expertise with digital creativity.

The second example is the lecture “*Strategies for Health Education*”, developed by Assoc. Prof. Dr. Ani Epitropova using the innovative applications **Canva** and **Slido**: <https://www.canva.com/design/DAG1F9U1hb8/aWekMfkiefk5ovt80ofruw/edit>

This lecture demonstrates an interactive approach to teaching, where visual design (via *Canva*) and engaging feedback tools (via *Slido*) create an active and motivating learning environment. The combination of both platforms fosters student participation through real-time questions, discussions, and reflection, turning the lecture into a model for the effective integration of digital technologies in university teaching.

Both examples illustrate innovative practices in digital pedagogy that merge academic content, interactivity, and technological solutions aimed at promoting active learning and developing key competences in higher education.

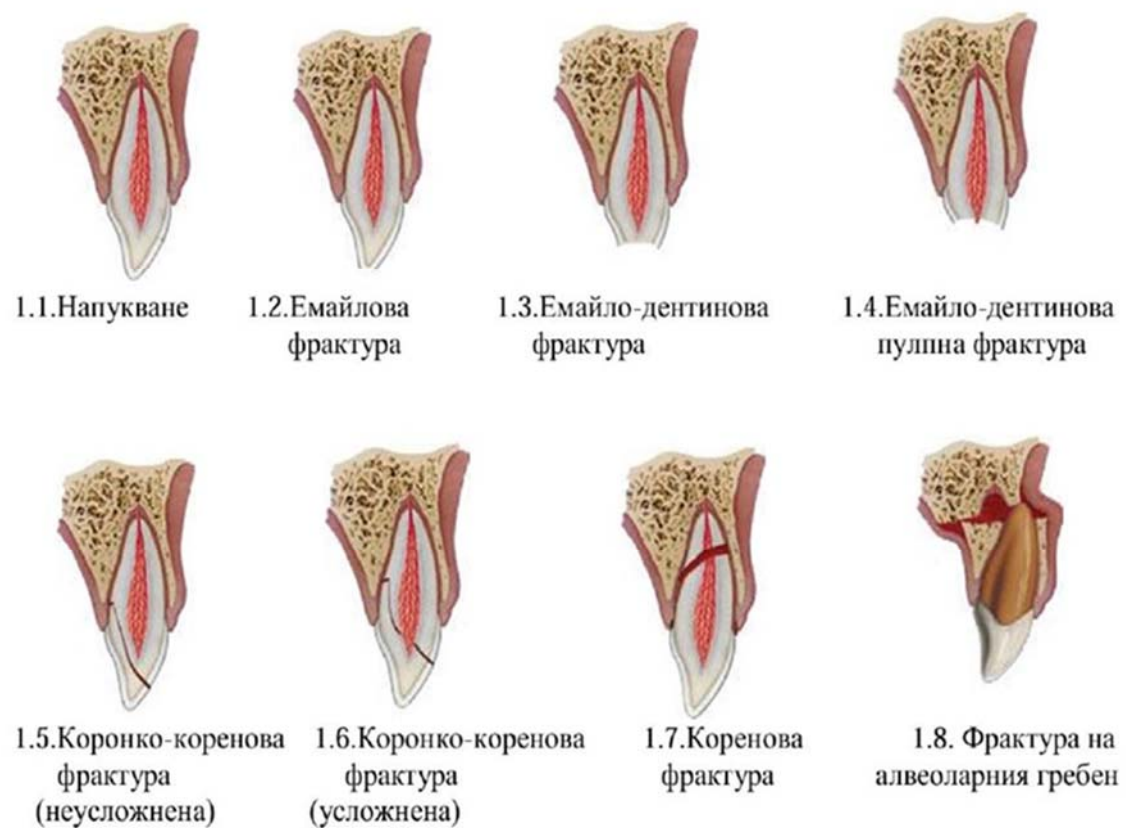


Figure. 2. Lecture “Trauma to Permanent Teeth in Childhood”

<https://sway.cloud.microsoft/8vuxKvMQqL887WAY?ref=Link>

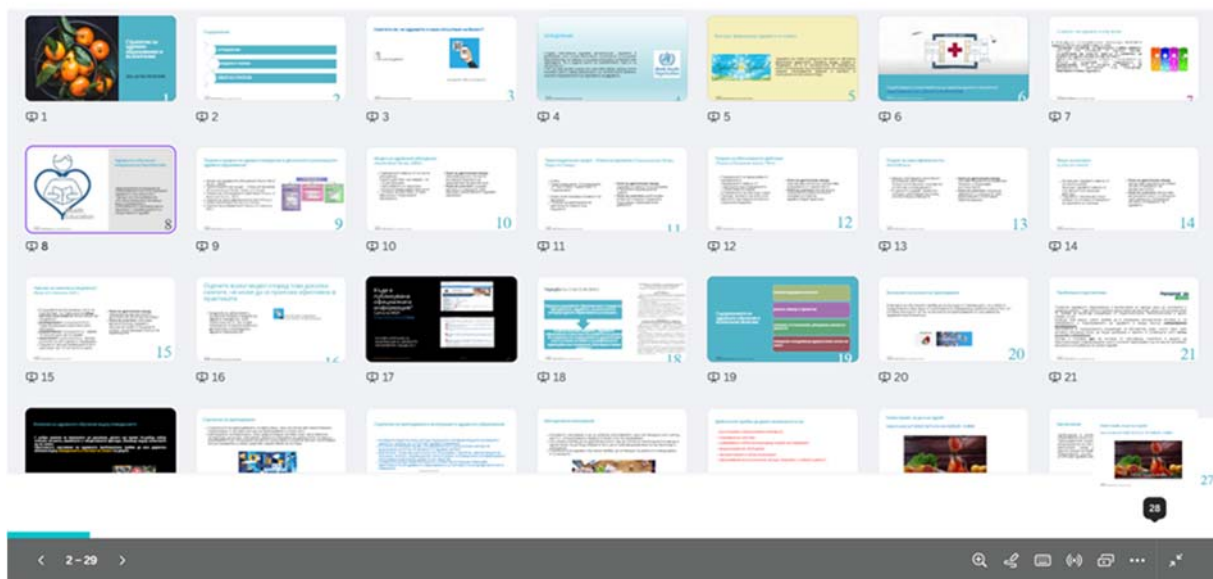


Fig. 3. Lecture “Strategies for Health Education”

<https://www.canva.com/design/DAG1F9U1hb8/aWekMfkiefk5ovt80ofruw/edit>

Reflective Practice

1. How has the integration of multimedia presentations and digital resources enhanced student engagement and understanding compared to traditional teaching methods?
2. Reflect on your experience using collaborative documents and interactive polls in your teaching practice. How have these technologies encouraged student collaboration and facilitated real-time feedback, and what adjustments have you made based on their responses and levels of engagement?

2.2. Understanding the Dynamics of Large Groups when Lecturing

Ani Belcheva

1. Managing Lecture Dynamics

Setting clear expectations

As a lecturer, it is important to set clear expectations for behavior and participation in order to effectively manage the dynamics of a lecture in front of a large group of students. Begin each session by outlining specific guidelines for student behavior, including expectations for active participation, respectful communication, and attentiveness. By clearly communicating these expectations, you create a framework for maintaining a positive and focused learning environment conducive to maximum engagement and success.

Encourage active participation

Encourage active student participation during the lecture by incorporating interactive elements such as group discussions, case studies, and practical problem-solving tasks to actively engage them with the material. By seeking input from students and inviting them to share their perspectives and opinions, you create opportunities for collaborative learning and a deeper understanding of dental concepts and techniques.

Incorporate strategies to maintain attention

It is well established that attention declines steadily after the first 5-10 minutes of a 60-minute lecture, reaching a low point after about 20 minutes before increasing steadily to near the initial level in the last five minutes (Bligh, 2000; Giles et al, 1982). To maintain students' interest and focus during the lecture, it is essential to incorporate strategies such as dividing the session into shorter segments and interspersing interactive activities or opportunities for student participation. In addition, consider using a variety of teaching methods, such as multimedia presentations, demonstrations, or hands-on exercises, to cater to different learning styles and keep participants actively engaged in the learning process.

In summary, effectively managing the dynamics of a large group lecture in dental education requires proactive measures to establish clear expectations, encourage active participation, manage disruptions, and incorporate strategies to maintain student attention. By applying these strategies carefully and consistently, you can create a positive and engaging learning environment that maximizes student learning and success.

2. Feedback Mechanisms

Implement regular feedback mechanisms, such as quizzes or surveys, to assess students' understanding and adjust the lecture's pace or content accordingly. This ensures that the material is delivered effectively.

Feedback mechanisms during lectures are crucial for enhancing the educational experience for both instructors and students. These mechanisms can take various forms, each designed to gather information about teaching effectiveness, levels of comprehension, and overall engagement. Below are several methods commonly used to collect feedback in academic settings:

Real-time feedback tools: Technologies such as clickers or mobile apps can be used during the lecture to gauge understanding and engagement. Students can be asked questions to answer anonymously, providing immediate feedback to the lecturer.

Post-lecture surveys: Distributed on paper or electronically, these surveys can request feedback on the pace, clarity, content, and teaching methods of the lecture. They can be specific to a single lecture or cover a series of lectures.

Question and answer sessions: Allocating time at the end of the lecture for questions and answers can help clarify any misunderstandings and provide immediate feedback to the lecturer on areas that may need further explanation.

Online discussion forums: Platforms such as Moodle, Blackboard, or even dedicated channels such as Slack allow students to post questions, comments, and feedback at any time. This ongoing dialogue can provide insight into their understanding and engagement.

Peer feedback: Encouraging students to provide feedback to each other, especially during group work or presentations, can stimulate collaborative learning and offer different perspectives on the content.

Individual meetings: Offering office hours or scheduling meetings with students can provide in-depth feedback and a more personal understanding of each student's learning process and difficulties.

Mid-semester feedback: Instead of waiting until the end of the course, gathering feedback halfway through allows the instructor to adjust their teaching strategies and address any issues while there is still time to make meaningful changes.

Observation by fellow faculty members: Inviting colleagues to observe a lecture and provide constructive feedback can offer new insights into teaching methods and student engagement strategies from an experienced educator's perspective.

Student performance analysis: analyzing grades, task completion rates, and other metrics can indirectly provide feedback on the effectiveness of teaching methods and understanding of lecture content.

Suggestion box: A physical or digital suggestion box allows participants to anonymously submit comments, suggestions, and concerns at any time, providing continuous feedback.

Each feedback mechanism has its strengths and limitations, and the most effective approach often involves a combination of several methods tailored to the specific context of the lecture and the preferences of the students and instructor.

3. Answering questions

Provide opportunities for students to ask questions and seek clarification. This can be done during designated question and answer sessions or through online platforms. Creating and maintaining a permanent open communication channel is a prerequisite for a supportive learning environment.

4. Accessibility and inclusion

Consider the accessibility of your learning materials for all students, including those with different learning abilities. Ensure that your lectures are inclusive and cater to a variety of needs.

Active learning techniques transform the traditional lecture format into a dynamic and interactive learning experience where learners engage directly with the material, the instructor, and each other. These techniques can improve understanding, retention, and application of knowledge. Here are some active learning strategies that can be incorporated into lectures:

Think/Share (pair work) Ask a question to everyone, give students some time to think about their answer, then have them pair up to discuss and share their thoughts before presenting to the rest of the class. This encourages individual reflection and peer learning.

Questions for surveys and clickers: Use electronic surveys or clickers to ask questions during the lecture. This can be used to gauge understanding, stimulate discussion, or make decisions about what to focus on next. Immediate feedback allows for adjustments to teaching on the fly.

Case studies and problem-based learning: Present real-life scenarios or problems for students to solve individually or in small groups. This approach encourages critical thinking, the application of knowledge, and collaboration skills.

Concept mapping: Have students create visual representations of the material that show the relationships between concepts. This can be done individually or in groups and helps with understanding complex information.

5. Time management

Manage your time effectively during the lecture. Break down complex topics into digestible segments and set aside time for interactive elements to maintain engagement without overwhelming students.

Example

You are tasked with facilitating a 1-hour lecture for 40 dental students on a specific topic (e.g., early childhood caries). To fit within your schedule, plan your key points and decide how much time you will allocate to each point. For example:

Introduction – 5 min

Definition of the disease "Early childhood caries (ECC)" – 5 min

Etiological factors – 10 min

Prevalence of ECC – 10 min

Clinical characteristics of ECC – 10 min

Treatment of ECC – 10 min

Question and answer session – 10 min

6. Continuous improvement

Seek feedback from students on the effectiveness of your teaching methods and make adjustments if necessary. Continuous improvement is crucial to optimizing the learning experience in large groups.

By understanding and addressing these dynamics, dental educators can create a more effective and engaging learning environment for students during lectures.

2.3 Practical Guidelines: Using Sway, Canva, and Office 365 for Effective Presentations

Microsoft Sway. (2025) – <https://sway.cloud.microsoft>

Microsoft Sway is a presentation program and a member of the Microsoft Office family of products. It is available as a free app through the Microsoft account (Hotmail, Live, or Outlook.com) and also included in the Office 365 subscription. Microsoft Sway is a unique and innovative tool for creating interactive, web-based presentations. Its emphasis on design and ease of use, makes it an attractive option for users looking to present information in a more dynamic and engaging way. Whether for educational, personal, or professional use, Sway offers a fresh approach to digital storytelling and presentations.

Benefits of using Sway for presentations and reports

1. Ease of Use: Intuitive interface suitable for all skill levels.
2. Interactivity: Incorporates dynamic content like videos and social media.
3. Responsive Design: Optimizes presentations for any device.
4. Integration: Seamlessly works with other Microsoft products.
5. Collaboration: Enables real-time, cloud-based teamwork.
6. Sharing: Simplifies distribution with link sharing and adjustable privacy settings.
7. Automatic Design: Assists in creating professional layouts without needing design skills.
8. Cost-Effective: Free for Microsoft account holders and included in Office 365.
9. Environmentally Friendly: Reduces the need for paper-based materials.
10. Analytics: Offers insights into viewer engagement.

Ideal Use Cases for Microsoft Sway:

- Educational projects and class presentations.
- Business reports and newsletters.
- Personal stories and travel journals.
- Interactive how-to guides and tutorials.

Getting Started with Sway

Here's a step-by-step guide to help you begin creating engaging and dynamic presentations:

1. Sign In or Sign Up:

- Go to the Microsoft Sway website (sway.office.com).
- Sign in with your Microsoft account. If you don't have one, you can create a new account for free.

2. Create a New Sway:

- Once logged in, click on “Create New” to start a new Sway project. Alternatively, you can start from an existing template or import content from a Word or PowerPoint file.

3. Add Content:

- Title your Sway: Click on the title card to add a title and optional background image.
- Insert content: Use the "+" button to add new content cards. You can add various types of content, including text, images, videos, tweets, and more.
- Reorder content: Simply drag and drop cards to rearrange the order of your content.

4. Choose a Design:

- Click on the “Design” tab to explore different design options. Sway offers a variety of styles and color schemes.
- Use the “Remix!” button for Sway to automatically suggest a new design. You can click this until you find a style that suits your taste.

5. Customize Your Layout:

- Select the “Layout” option to choose how your Sway will be navigated by viewers. You can opt for a scrolling vertical layout, a horizontal one, or a slideshow format.

6. Preview Your Sway:

- Click the “Play” button to see how your Sway looks to viewers. This allows you to preview the flow and design of your presentation.

7. Share Your Sway:

- Once you are satisfied with your Sway, click on the “Share” button to share your project. You can choose who can see your Sway by setting it to private, public, or by sharing it with specific people.
- You can share the link directly, or you can embed your Sway on a website or blog.

8. Collaborate:

- Sway allows for collaboration. Share your Sway with colleagues or friends and allow them to edit by sending them an editable link.

Adding Multimedia to Your Sway

Adding multimedia to your Microsoft Sway can significantly enhance the visual appeal and effectiveness of your presentation or report. Here's how to add various types of multimedia content to your Sway:

1. Adding Images:

- From your device: Click the “+” icon to add a new card, select “Media”, and then choose “Image”. You can upload images from your device.
- Online sources: Sway allows you to search and insert images directly from the web, including from Bing images, via the same “Image” option.
- Drag and drop: You can also drag and drop images directly into your Sway canvas from your computer.

2. Adding Videos:

- From YouTube or other platforms: Add a new “Media” card, select “Video”, and paste the URL of the video you want to include.
- Embed codes: For other video platforms, use the “Embed” card to paste the video’s embed code directly into your Sway.

3. Adding Audio:

- Upload audio files: Click the “+” icon, select “Media”, and then choose “Audio” to upload audio files from your device.
- Use online audio: Similar to video, you can use the “Embed” card to include online audio files by pasting the embed code.

4. Adding Social Media Content:

- Embed Tweets, Facebook posts, etc.: Use the “Embed” card to paste the embed code or URL from social media platforms like Twitter or Facebook to directly include social media content in your Sway.

5. Adding Charts and Graphs:

- Excel charts: You can embed Excel charts directly into Sway by selecting “Chart” under the “Media” option and then choosing from your OneDrive-stored Excel files.
- Interactive charts: Alternatively, use the “Embed” card to paste HTML code from interactive chart tools like Google Charts.

6. Adding Documents:

- Embedding Word, PDF, and PowerPoint files: You can embed documents directly into your Sway. Select “Media” and then “Document” to upload files from your device or OneDrive.

7. Customizing Multimedia Content:

- **Captioning:** Add captions to your multimedia to provide context or explain what viewers are seeing.
- **Focus Points:** For images, set focus points to ensure the most important parts of your images are visible, regardless of how Sway formats them.
- **Layouts:** Experiment with different layouts and grouping options to present your multimedia in the most effective way.

Tips for Using Sway Effectively:

- **Organize Content:** Use headings and grouping to organize your content logically.
- **Keep it Visual:** Make use of images, videos, and other media to make your Sway more engaging.
- **Stay Concise:** Keep text brief and to the point for better engagement.
- **Review and Edit:** Always preview and edit your Sway before sharing it broadly.

General Tips for Adding Multimedia:

- **Relevance:** Ensure all multimedia elements are relevant to your content and add value to your narrative.
- **Quality:** Use high-quality images and videos to maintain a professional look.
- **Balance:** Maintain a good balance between text and multimedia to avoid overwhelming your audience.
- **Legal considerations:** Only use media that you have the rights to use or that is available for free use under copyright laws.

Microsoft Sway offers a modern approach to presentations and reports by making them more interactive, engaging, and accessible. Its integration with other Microsoft tools, ease of use, and flexibility make it an excellent choice for individuals and organizations looking to elevate their presentation and reporting capabilities.

CHAPTER TWO

3. Effective Design of Seminar and Practical Exercises

Ani Epitropova

Session Overview

This section is designed for academic staff who wish to enhance teaching and learning in small-group settings such as seminars, laboratories, and practical exercises. Its aim is to empower university educators to refine and expand their competences in creating engaging, inclusive, and intellectually stimulating learning environments. It also provides guidance on the use of Augmented Reality (AR) and Virtual Reality (VR) to facilitate learning and effectively communicate complex concepts through visual presentations, thereby improving comprehension and retention.

Session Structure

3. Effective Design of Seminar and Practical Exercises

- 3.1. Advantages of Small-Group Learning in Higher Education
- 3.2. Development of Specific Professional Competences
- 3.3. Specific Methods for Small- Groups Teaching
- 3.4. Application of Augmented and Virtual Reality to Improve Teaching Quality

Expected Learning Outcomes

Upon completion of this section, participants will be able to:

1. Develop and refine their skills in designing and facilitating seminar, practical, and laboratory sessions through the application of reflective practice principles.
2. Apply effective approaches to foster 21st-century competences among learners, including critical thinking, creativity, communication, and collaboration.
3. Identify and analyze the main advantages of small-group learning, such as increased engagement, evidence-based reasoning, and improved communication skills.
4. Plan and implement group activities aimed at promoting collaboration and developing key professional competences.
5. Evaluate and adapt diverse small-group teaching methods to stimulate active learning and maximize student participation.
6. Integrate contemporary technologies into the learning process, such as Augmented Reality (AR) and Artificial Intelligence (AI) tools (e.g., ChatGPT), to personalize instruction, provide immediate feedback, and enhance teaching quality.

Development of Specific Professional Competences

Ani Epitropova

Particular emphasis is placed on the development of specific professional competences related to health education and prevention in pediatric dentistry.

For future teachers, this includes:

- The ability to plan and implement integrated lessons with a health-education focus (
- Skills for working within inter-institutional partnerships (school–family–health institutions), in line with the Council Recommendation on Key Competences for Lifelong Learning (European Council, 2018);
- Competence in communicating with children and parents regarding healthy lifestyle habits and oral hygiene.

For dental medicine students and educators, the emphasis is placed on:

- Skills for effective and ethical communication with children and their parents, in accordance with the Framework – “The Graduating European Dentist”;
- Competence in applying behavioral approaches and motivational strategies for children in preventive contexts;
- Knowledge and skills for implementing health-education and prevention programs in compliance with the National Programme for the Prevention of Oral Diseases in Children Aged 0–18 in the Republic of Bulgaria (2021–2025) and the National Strategy for Child and Adolescent Health and Pediatric Care 2030.

The development of these competences contributes to the formation of professionals with interdisciplinary preparation and a strong commitment to sustainable practices that promote child health.

This section aims to support the enhancement of the professional competence of academic staff through the exploration and application of innovative strategies and technologies that optimize teaching and learning in the context of small-group instruction.

3.1. Advantages of Small-Group Learning in Higher Education

Small-group learning is one of several educational strategies used to facilitate active learning. It can serve either as the foundation of an educational program or as a complementary component to other approaches such as lectures or independent study. Research in dental and health sciences education shows that small-group learning formats (such as team-based learning, problem-based learning, jigsaw methods) offer advantages over traditional lectures. Small groups foster interactive learning environments in which students collaborate, receive

peer and facilitator feedback, and develop not only disciplinary knowledge but also essential professional skills such as problem-solving, communication, presentation and teamwork (Burgess et al., 2020; Trill et al., 2024; Wang et al., 2025). It provides a valuable platform for cultivating a set of core skills that are crucial for professional development, interpersonal dynamics, presentation abilities, and effective communication. These skills, distinguished by their universality and applicability, are inherently difficult to develop in isolation, which necessitates a learning environment rich in feedback and interpersonal interaction.

Effective communication is among the core competences required of both dental professionals and educators. In the context of small-group learning, communication becomes not only necessary but also a central element of the learning process. Within this environment, students are encouraged to engage in dialogue with their peers, refining their communicative abilities through active discussion and exchange. Furthermore, the dynamics of small groups facilitate the development of skills such as constructing persuasive arguments, articulating positions clearly, and providing constructive feedback to fellow participants.

An integral component of professional culture is the ability for **self-reflection** and self-assessment. Small-group learning offers students opportunities to evaluate not only their individual contributions but also those of their peers, thereby fostering self-awareness and responsibility—qualities essential for professional growth.

Small-group learning also enables learners to develop a deeper understanding of the subject matter, supporting the application of acquired knowledge to future and novel situations. Moreover, teamwork is recognized as a key professional skill in which the ability to collaborate effectively as part of a group is of paramount importance.

Research has shown that, despite initial experiences of discomfort or anxiety, students' attitudes toward small-group active learning methods are generally positive. Key factors influencing the level of satisfaction include: (a) the facilitator's role, (b) the structure of the sessions, (c) individual student factors, (d) the authenticity of the cases, (e) the degree of feedback, (f) group cohesion, and (g) the availability of resources (Kilgour, Grundy, & Monrouxe, 2016).

Examples of small-group learning activities include: acquiring and deepening knowledge on a specific topic; shaping attitudes and perspectives; improving problem-solving abilities; promoting empathy and patient sensitivity; enhancing responsibility for learning; developing interpersonal and teamwork skills; and refining practical competences.

Reflective practice

- How can working in small groups help you improve your teaching and develop important skills in your students, such as communication, critical thinking, decision-making, and working with people?
- How is small group learning more effective than traditional lectures for building skills such as argumentation, giving feedback, and empathy?

3.2. Development of Specific Professional Competences

Despite the many advantages of small group learning, the role of the teacher remains a key factor in achieving effective academic learning. In order to lead the learning process in a student-centered way, academic teachers should develop and apply specific teaching competencies that go beyond the traditional function of teaching through knowledge transfer. High-quality small group teaching requires teachers to possess competencies that respond to new realities, including the integration of technology, an interdisciplinary approach, and an emphasis on prevention and health culture. The development of these competencies is key to preparing professionals who are able to apply innovative methods in their work with children, families, and communities.

1. Skills for facilitating the learning process

Facilitation is a pedagogical approach in which the teacher acts not as the central source of knowledge, but as a moderator, motivator, and navigator of the learning process, creating conditions for students to actively participate, interact with each other, and construct their own understanding. This includes conducting discussions, managing group dynamics, asking guiding questions, structuring tasks, and creating an environment that encourages critical thinking and collaborative learning.

For example, during a seminar exercise on "Healthy Eating and Oral Health," the facilitator does not simply present information, but organizes students into small groups in which they analyze different eating habits, discuss the relationship between sugar and tooth decay, examine a case study of a student with frequent dental problems, and propose strategies in the context of health prevention. The teacher guides the process through questions, supports the participants' arguments, and provides an opportunity for reflection on what has been learned. This approach develops key competencies in students, such as: effective communication and teamwork, applying knowledge in a practical context, critical analysis and preventive thinking, behavioral intervention skills, and health education.

Addressing challenges in facilitating small group learning

Small group learning offers significant pedagogical advantages, but it is often accompanied by a number of practical difficulties for both the facilitator and the learners. According to Kitchen, M. (2012), the reasons for problems in group dynamics can be varied, among which the following stand out:

- passivity and unwillingness of students to engage in dialogue with each other;
- lack of prior preparation for specific tasks and discussions;
- individual participants who do not contribute to the work of the group—due to insecurity, disinterest, or dependence on more active colleagues;
- domination of the conversation by one or more students, which discourages the participation of others;
- redirecting attention solely to the facilitator as the main source of knowledge and solutions;
- limiting the facilitator's questions to the reproduction of facts, without encouraging analysis or argumentation;
- lack of effort to engage students in formulating answers independently;
- insufficient, unstructured, or delayed feedback;
- dominance of a monologue, lecture style instead of encouraging active facilitation.

An effective facilitator must analyze the causes of the problem, consider alternative approaches to overcoming it, and create conditions for shared responsibility among group members (Kitchen, 2012). In certain cases, simply identifying and discussing the problem with participants can stimulate awareness and self-regulation, but it is often necessary to apply specific pedagogical strategies.

With dominant participants: the facilitator can summarize the main ideas, direct the conversation to other group members, set time limits, or assign clearly defined tasks that require cooperation.

For quieter or less confident participants: it is advisable to allow more time for responses, use short tasks in pairs or small subgroups, and encourage every comment with positive feedback.

When attention is focused solely on the facilitator: build on student responses by including brief practical examples or presenting a professional context that highlights the applicability of the topic under discussion.

In case of insufficient feedback: it is useful to schedule time for discussing what has been achieved during or immediately after the session.

For unprepared participants: it is effective to introduce short tests or diagnostic tasks at the beginning of the session, which encourage individual responsibility and prevent delays.

2. Communication skills

In the context of contemporary health education, effective communication is no longer limited to the clear transmission of information. It encompasses the ability to build meaningful dialogue based on empathy, cultural sensitivity, and active listening. In small group learning environments, academic teachers should master techniques for facilitating discussions, motivating students to express their opinions in a reasoned manner, and structuring an environment in which the exchange of ideas is equal and stimulates critical thinking. Innovations in digital communication — such as the use of AI-based platforms (e.g., ChatGPT for simulations and feedback) and online collaborative tools (collaboration platforms) — provide additional opportunities for engagement and development of communication skills among both students and teachers. In a health education context, this also means the ability to communicate preventive messages in accessible and behaviorally effective language.

3. Adaptability

Teachers should develop their ability to adapt teaching strategies and approaches to meet the needs of students with different learning styles, needs, and interests within the seminar, practical, or laboratory exercise. Adaptability is becoming a critical competency in teaching, especially in health education, where teachers often work with students with different educational and cultural backgrounds, learning styles, and expectations. The integration of new technologies—such as augmented reality (AR), mobile simulation apps, or interactive case studies—requires the teacher to adapt their methods to encourage engagement and understanding regardless of the environment (face-to-face, distance, or hybrid). The ability to change approaches according to group dynamics, topic, and context (e.g., a seminar on healthy eating or a laboratory exercise on dental plaque analysis) ensures deeper learning and more effective transformation of knowledge into practical skills. The adaptive teacher also recognizes the need for individualized support, including for students in vulnerable or disadvantaged positions—one of the leading trends in education geared toward equal access and inclusion.

4. Feedback and assessment of achievements in small groups

Providing constructive and timely feedback on performance, progress, and understanding is an essential teaching competency, especially in the dynamics of small groups. In the context

of contemporary health education, this includes not only traditional forms of assessment, but also the application of innovative approaches such as real-time formative assessment, electronic rubrics, digital learning journals, and feedback through AI-based tools. A study by Alazemi (2024) demonstrates the positive effect of AI-integrated formative assessment on learners' progress in understanding, academic satisfaction, and motivation, highlighting the role of technology in stimulating effective learning. In addition, Panadero (2024) shows how online rubric platforms contribute to objectivity, transparency, and engagement in the assessment process, especially in a collaborative and participatory learning environment. These innovations enable the instructor to provide personalized and targeted feedback, which is in line with leading trends in health education. When teaching in small groups, the prioritization of assessment should be tailored to the nature of the activity. For example, traditional tests may be appropriate for testing knowledge, but peer assessment significantly improves interpersonal skills and unlocks the potential of collective learning. Students assess not only the substantive participation of their peers, but also their collaboration skills, emotional intelligence, and effective communication. In addition, assessing the student experience through short digital surveys or mobile apps after class provides feedback on the clarity of the session, the effectiveness of facilitation, opportunities for active participation, and equal contribution. In line with the trend of involving students in the process of improving the learning environment, this information helps adapt the methodology to the real needs of learners. Feedback from the teachers themselves is equally valuable, especially from those who are at the beginning of their teaching careers. Their participation in peer review and observation sessions allows for the identification of strengths and areas for development, creating opportunities for personalized professional improvement in line with contemporary academic standards.

5. Technological integration

In order to effectively integrate digital technologies into seminars, practical exercises, and laboratory exercises, academic teachers should possess a combination of pedagogical, technical, and digital competencies. First, they must understand the potential of technologies to enrich the learning process, including the possibilities of online modules, virtual simulations, electronic collaboration platforms, and mobile applications for feedback and learning. The comparative table of digital tools for interactive learning and feedback provides an opportunity to make an informed choice of digital tool.

Table 1. Comparative table of digital tools for interactive training and feedback

TOOLKITS	ADVANTAGES	LIMITATIONS	APPLICATION RECOMMENDATIONS
Slido	Questioning, surveys, integration with presentations	Limited free features	To encourage discussion and exchange of opinions, they offer questions and answers and interactive walls for ideas, which create active communication in the audience.
Padlet	Gathering real-time opinions, ideas, and comments	Less structured data for analysis	
Mentimeter	Real-time visualizations, different types of questions	The full version is paid	
Poll Everywhere	Interactive surveys, easy integration with PowerPoint	Paid access for larger groups	Real-time knowledge testing - allows for a variety of question types with immediate visualization of results.
Wooclap	Lots of question types, mobile access	Some functions are paid	
Microsoft Forms	Microsoft 365 integration, easy sharing	Less visualization options	Appropriate for more in-depth surveys and data collection, especially if the university already uses Microsoft 365.
TurningPoint	Appropriate for large audiences, reliability	Requires hardware (clickers), higher price	For large audiences with limited resources – TurningPoint (clickers) and Plickers are suitable when students do not have personal devices or Internet access.
Plickers	No devices required from students, inexpensive solution	Limited question types, more basic functionality	

Providing feedback using digital tools for interactive learning and research is a key element in improving the effectiveness of seminars and practical exercises in health education. These tools support the active involvement of students by giving them the opportunity to express their opinions, participate in discussions, and test their knowledge in real time. Through them, academic staff can receive adequate feedback, diagnose the level of learning, identify students' attitudes and difficulties, and adapt their teaching methods to the specific needs of the audience. In addition, the use of platforms such as Mentimeter, Slido, Padlet, as well as specialized applications such as Nearpod and Socrative, expands the possibilities for interactivity by integrating visual and game elements, as well as systematic knowledge testing, which creates conditions for more in-depth learning and the formation of professional competencies. Teaching skills are required, whereby technological tools are not used for their own sake, but correspond to the learning objectives, the characteristics of the group, and the specifics of the content—for example, when teaching health education topics such as nutrition and oral hygiene.

The lecturer must also be able to adapt the technology to different learning styles, plan activities with clearly structured stages, and facilitate the active participation of learners in a digital environment.

6. Empathy and support

Empathy and the ability to provide support during the learning process are essential competencies for academic staff in modern health education. They include not only emotional sensitivity, but also a conscious and professional attitude towards the challenges faced by students, related both to the learning content and to personal or social factors affecting their motivation and progress. The educator must be able to identify signs of difficulty, create a supportive and safe learning environment, and offer appropriate guidance tailored to the needs of the learners. In small group settings, this means carefully facilitating group dynamics, encouraging mutual support, and building a culture of respect and tolerance. The use of digital journals, anonymous feedback, and personalized recommendations through AI tools can also support individual tracking and care for student well-being. In this way, empathy becomes an active element of the academic role—not just an emotional attitude, but a strategic approach to building an inclusive and effective educational environment.

7. Critical thinking and problem solving

In modern health education, educators must possess and purposefully develop critical thinking and problem-solving skills in order to effectively model and encourage these skills in students. This includes the ability of the academic educator to analyze learning situations, formulate thought-provoking questions, encourage students to independently analyze and evaluate information, identify key health and social issues, and create conditions in which learners explore, argue, and make informed decisions.

8. Reflective practice

Reflective practice is a professional competence that refers to the ability of university educators to consciously and systematically reflect on their own teaching activities in order to identify what works effectively, where difficulties arise, and how they can improve their teaching methods. In higher education, this includes not only monitoring the results of the learning process, but also analyzing interactions with students, the educational technologies used, the dynamics of small groups, and the effectiveness of facilitation. Reflection can be achieved through self-observation, feedback from students, colleagues, or peer observations, and is linked to contemporary trends in evidence-based teaching and contextual adaptation. An academic lecturer who practices reflective thinking is better able to implement innovations, respond to the individual needs of learners, and maintain high-quality teaching.

9. Empowering learners

The beliefs of the academic educator are crucial, as they determine their approach to teaching. An educator who embraces the social constructivist theory of learning and places the learner at the center of the educational process typically:

- Uses precise and discipline-appropriate terminology in dialogue with students.
- Accepts and encourages learner autonomy.
- Allows students to take responsibility for their own learning and select suitable learning strategies.
- Seeks to inspire interest and cultivate an atmosphere of personal accountability for learning rather than simply transmitting information.
- Promotes the development of critical and creative thinking by posing open-ended questions and encouraging students to formulate hypotheses and design procedures to test them.

- Embraces digital tools and anticipates their impact on education, taking a forward-looking approach to enhancing student engagement and preparing them for technology-integrated learning.

Conclusion

In health and dental education—particularly in training focused on prevention and the promotion of oral health—the competence of academic educators in facilitating small-group learning is essential for delivering effective, student-centered instruction. To successfully guide the learning process, the educator must demonstrate a broad set of pedagogical competencies, including the ability to facilitate interactions, build effective communication, adapt to diverse learning styles, and provide timely, constructive feedback.

Moreover, the integration of modern technologies, the demonstration of empathy and support, the promotion of critical thinking and problem-solving, the practice of reflection, and the empowerment of students are defining attributes of an educator prepared for the new realities of health education. By applying a social constructivist approach and creating an environment in which students actively participate in the development of their competencies, the academic educator prepares them not only for successful professional practice but also for leadership roles in prevention and health promotion.

Thus, small-group teaching emerges as a strategic tool for cultivating responsible, engaged, and competent professionals capable of meeting the demands of contemporary health and dental practice.

Reflective practice

Which are the two competencies you consider most important for effective teaching in small groups and for creating an engaging and supportive learning environment?

Which good practices from your own experience support active participation and critical thinking among students?

3.3. Specific Methods for Teaching in Small Groups

Ani Epitropova

A variety of methods can be employed for teaching in small groups, with the choice depending on the intended learning outcomes and the level of student competence to be achieved. Traditional approaches in higher education include explanation, discussion, simulation, and practical exercises.

However, the specific nature of dental and health education necessitates teaching methods that emphasize active participation, problem-solving, and collaborative learning. These

methods not only enhance knowledge acquisition but also foster the development of critical professional and interpersonal skills. Within this framework, the following methods are particularly recommended:

Research-based learning is recognized as a distinct and valuable method in university-level dental and health education. It integrates research activities and methodologies into the curriculum, engaging students actively in authentic scientific inquiry or selected components of the research process. Through data analysis, engagement with academic sources, and the application of critical thinking, students develop essential skills in evidence-based practice and learn to bridge theory and practice by conducting research tasks, mini-projects, or experimental studies.

In seminar activities and small-group settings, this method is implemented through literature reviews, research design, and the presentation of results, transforming students into active participants in the academic and scientific community. Such engagement fosters a culture of inquiry and innovation that enhances the quality of higher education and aligns with accreditation standards.

As highlighted by Riiser et al. (2023), the learning outcomes of research-based education are most commonly reflected in the development of specific research competencies—such as conducting literature reviews, academic writing, and presenting findings—but also include a deeper understanding of the research process, as well as increased motivation and confidence in conducting scientific work.

Within dental education, the application of this method equips future professionals to adopt evidence-based practices, thereby contributing to the continuous advancement of the profession and ensuring compliance with the standards of the National Evaluation and Accreditation Agency. The principal advantage of this approach over traditional lecture-based formats lies in its capacity to promote learner autonomy, deeper conceptual understanding, and active student engagement in the learning process.

Problem-based learning (PBL) involves presenting students with complex problems or scenarios from the field of dental medicine and health education, encouraging them to research, collaborate, and propose solutions.

Key features:

- Authenticity of problems – cases are based on real situations or are close to them.
- Autonomy – learners themselves formulate what they need to learn, plan and integrate their knowledge.

- Integration of knowledge – linking basic sciences (anatomy, physiology, microbiology) with clinical thinking and practice.
- Development of key skills – teamwork, independent learning, critical thinking, and professional communication.

Implementation procedures

1. Problem Presentation – Students are provided with a written or simulated clinical case (for example, a patient with gingival bleeding, pain, or dental caries).
2. Problem Analysis – The group discusses what is known, what remains unclear, and formulates preliminary hypotheses.
3. Formulation of Learning Questions – Students identify what they need to investigate (e.g., differential diagnosis, treatment options, preventive strategies).
4. Independent Research – Each student explores a specific topic using academic literature or digital resources.
5. Group Sharing and Integration – Findings are discussed collectively; knowledge is synthesized, and a solution is formulated.
6. Application and Reflection – Students propose a treatment or health education plan and analyze their learning process.
7. Facilitator’s Role – The lecturer guides the discussion, ensuring clinical relevance and scientific validity without providing ready-made answers.

This teaching method delivers the following *results*:

- It enhances diagnostic thinking and the ability to work in conditions of uncertainty.
- Improves long-term knowledge retention compared to lecture-based teaching.
- Encourages lifelong learning skills, which are critical in dynamic medical practice.
- Supports the formation of professional identity, teamwork, and ethical reasoning.

Recent studies (Bendermacher et al., 2023) confirm that problem-based learning (PBL) is particularly effective in dental and medical programs, as it bridges theory and practice while fostering evidence-based thinking.

Team-Based Learning (TBL) is a method in which students are divided into small teams to work collaboratively on tasks, solve problems, or discuss learning materials. The process typically includes individual pre-class preparation, readiness assurance tests to evaluate team understanding, and practical application of knowledge through group exercises and discussions.

Combining elements of Problem-Based Learning (PBL) and Team-Based Learning (TBL) creates effective and diverse approaches that align with contemporary principles of instructional design. This integration leverages the strengths of both methods to optimize

learning outcomes and enhance active student engagement (Dolmans, Michaelsen, van Merriënboer, & van der Vleuten, 2014).

Case-Based Learning (CBL) is an instructional method in which students collaborate to analyze and discuss real or simulated patient cases, applying their theoretical knowledge to diagnose conditions and formulate appropriate treatment plans. This method has been widely recognized as an effective pedagogical strategy in medical and dental education, as it provides practical relevance to theoretical concepts and effectively bridges the gap between theory and clinical practice through authentic, context-rich scenarios.

The impact of CBL extends beyond cognitive gains, contributing to measurable improvements in clinical reasoning and patient care outcomes (McLean, 2016). Empirical studies further demonstrate that CBL significantly enhances critical thinking, problem-solving capacity, teamwork, communication skills, and overall student satisfaction with the learning process (Varma et al., 2025).

The Peer Teaching (Peer-Assisted Learning) Method involves students who both teach and learn from one another. This can take various forms—for example, one student may deliver a short lecture, lead a discussion, or assess a peer’s work. In this approach, the roles of *teacher* and *learner* alternate, allowing each participant to experience both perspectives. The key benefit lies in the fact that, through teaching, students deepen their own understanding, while the listeners receive explanations from someone at a similar educational level, who can use accessible language and relatable examples.

In medical and health education, the peer teaching method is widely applied for acquiring clinical skills, patient history-taking, data interpretation, and other practical competencies. Empirical research demonstrates that involving students as instructors during practical sessions leads to significantly higher academic performance among both learners and their peer educators compared to control groups (Comfort, P., McMahon, J., & John, L., 2014). Moreover, peer-assisted learning within standardized dental education programs has been shown to enhance theoretical knowledge, clinical skills, and learner engagement, while fostering collaboration, effective communication, and satisfaction with the learning process (Wang et al., 2025).

This method not only supports the acquisition of professional competences but also cultivates leadership, reflective thinking, and mutual support—essential qualities for future medical professionals.

Role-playing activities represent an interactive instructional method in which students assume different professional roles and recreate realistic situations from clinical practice. These

exercises allow learners to simulate scenarios such as patient consultations and treatments, teamwork, and interprofessional communication, thereby practicing clinical skills, developing empathy, and enhancing their communication abilities. Conducting role-playing sessions in medical and dental education creates a safe learning environment where students can exercise clinical reasoning, effective communication, and teamwork skills, bridging the gap between theory and real-world practice (Nestel & Tierney, 2007).

Debate requires students to research and present arguments from opposing sides of a topic, fostering critical thinking, communication skills, and the ability to articulate and defend viewpoints.

The “**Jigsaw technique**” involves dividing students into small groups, each responsible for exploring a different aspect of a broader topic. Once they become “experts” in their assigned subtopics, they reconvene in new mixed groups to share their knowledge, enabling collaborative learning and reinforcing collective understanding of the subject matter.

The “**Think–Pair–Share**” (TPS) method is a structured active learning strategy in which students first reflect individually on a given question or problem (*Think*), then discuss their ideas in pairs (*Pair*), and finally share their conclusions with the larger group (*Share*). This approach promotes engagement, communication skills development, and collaboration among learners, while also fostering a deeper understanding of the content and stimulating critical thinking.

Recent studies confirm the effectiveness of the method. Guenther and Abbott (2024) found that the “Think–Pair–Share” technique increases student participation, improves the quality of discussions, and that the *thinking* and *pair discussion* stages are particularly important for achieving equitable participation and in-depth analysis.

The application of the method in dental education has also shown positive outcomes, effectively stimulating interaction and engagement among participants in online learning environments, while supporting both collaborative learning and reflection on course content (Ramesh, Case, Stockstill, & Dragan, 2021).

The “**Flipped Classroom**” method is an innovative approach in which students acquire the core learning material in advance through independent study—most often using online resources, video lectures, or digital learning modules. This allows classroom time to be dedicated to small-group activities focused on active learning, such as case analysis, discussions, problem-solving, and practical exercises under the guidance of the instructor.

This model encourages collaboration, critical thinking, and a deeper understanding of the content, while simultaneously developing self-regulated learning and teamwork skills.

Recent research emphasizes that the flipped classroom model, when combined with small-group activities, leads to higher student engagement, improved peer interaction, and greater overall learning effectiveness (Ekanayake & Silva, 2025).

Mind mapping is an effective method for facilitating seminars and small-group teaching sessions. It involves encouraging participants to visually represent ideas, concepts, and their interconnections—either on paper or in digital format. This method promotes active engagement and collaboration, as learners collectively contribute their perspectives and insights to a shared visual structure. By organizing information in a nonlinear, associative format, mind maps support deeper understanding, retention, and recall of complex concepts.

A study by Yang, Gao, Li, Ye, Sun, and Huang (2023), titled *Application of Mind Mapping in Health Education for Continuous Care of Children with Dental Caries*, provides a compelling example of how visual strategies can be applied effectively in health education. The authors compared traditional teaching methods with a mind-mapping–based method that visually represents key concepts, relationships, and preventive practices.

Their findings indicate that the use of mind mapping enhances comprehension of educational content, increases engagement, and strengthens sustained motivation to adhere to health recommendations among both children and their parents. Moreover, the method proved effective as a communication-enhancing tool between healthcare professionals and families, facilitating information exchange and encouraging active participation in the care process.

This example illustrates the potential of mind mapping as a pedagogical method that promotes active learning, critical thinking, and empathetic communication within the broader context of health education.

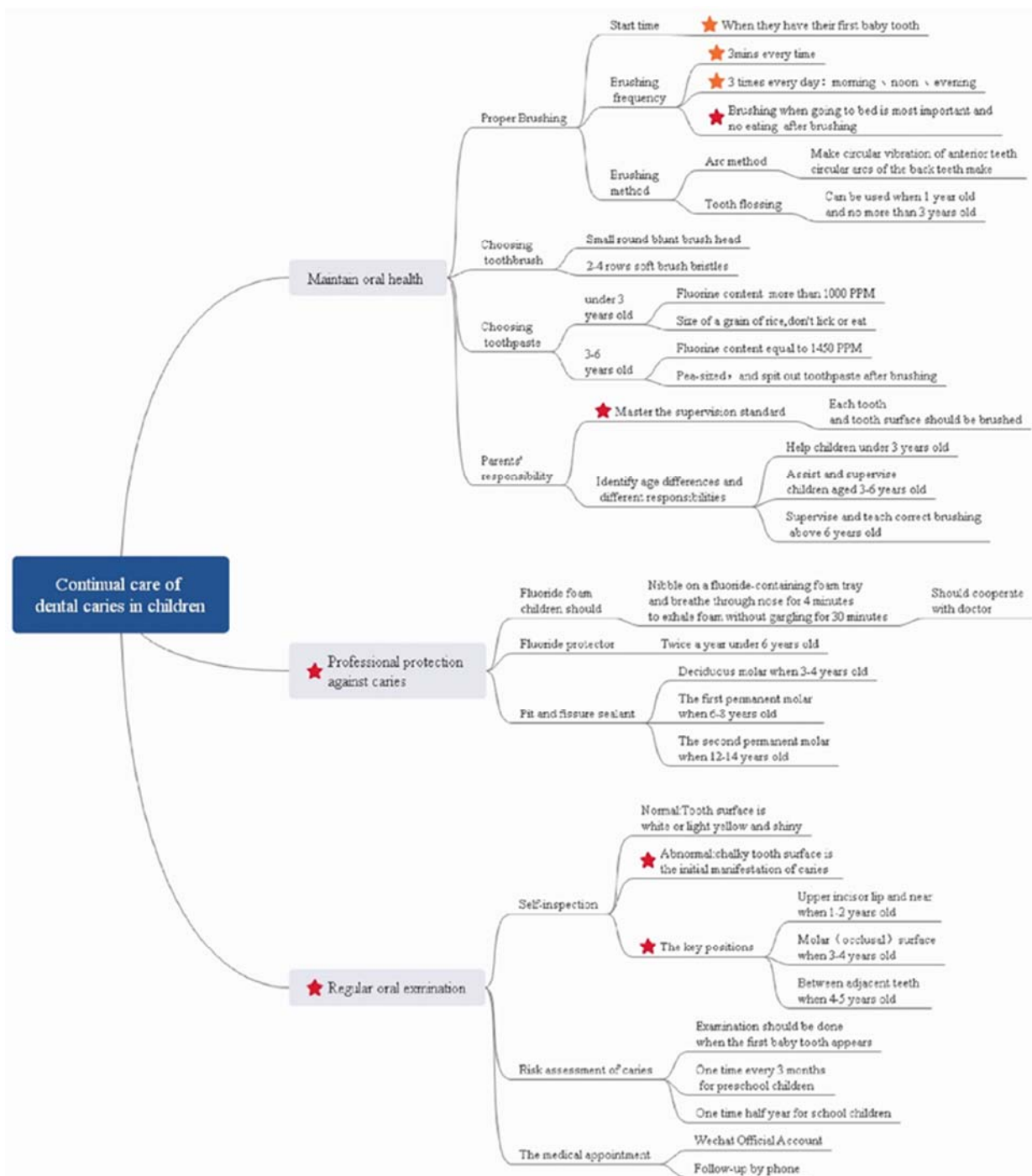


Figure 4. Example of a mind map from the referenced study, illustrating how complex concepts can be visualized in a clear and structured manner to support deeper understanding and analysis.

Kinchin and Cabot (2007) examine concept mapping as an innovative instructional tool in clinical dental education. In their article “*Introducing Concept Mapping into Dental Education: The Case of Designing Partial Dentures,*” the authors present the methodology of

this approach and demonstrate, through concrete examples, how the visual representation of relationships between concepts supports active teaching and deep learning.

Concept mapping is established as an effective method for developing clinical expertise, as it links theoretical knowledge with practical skills and fosters critical thinking and a systematic approach to understanding complex clinical relationships (Kinchin & Cabot, 2007).

In the context of higher education, mind mapping represents an effective method for visually structuring knowledge, supporting comprehension, retention, and integration of new information. Through the graphical representation of relationships between concepts, students can more easily organize complex ideas, plan projects, or summarize lecture and research content. According to ClickUp (2025), mind-mapping tools facilitate the visualization and realization of ideas, enhance collaboration, and foster critical and creative thinking — skills essential for lifelong learning.

For the needs of higher education, different platforms can be used depending on the purpose and mode of work:

- *For individual work* – MindNode, Xmind, MindMeister, and EdrawMind are suitable for personal planning, summarizing course content, and exam preparation through a structured and visual approach.
- *For team collaboration* – ClickUp, Miro, Coggle, FigJam, MindGenius, Creately, Ayoa, and Lucidchart are particularly effective, enabling simultaneous creation and editing of mind maps, adding comments, tracking tasks, and integrating with project-management platforms.

The use of these tools in university teaching promotes active learning, collaboration, and self-reflection, enabling students to structure their knowledge in ways that stimulate both understanding and creative thinking.

In conclusion, small-group learning in higher education provides opportunities not only for acquiring professional knowledge but also for the targeted development of key personal competences. Stress management, self-awareness, and self-discipline are cultivated through clinical practice and reflection, while learning strategies, creativity, and adaptability are fostered through problem-based learning and case analysis. Time management and productivity are strengthened through structured assignments and simulation exercises, and readiness for lifelong learning is enhanced through research projects and ongoing professional development.

By applying contemporary teaching methods aligned with intended learning outcomes, educators create an effective environment that promotes engagement, critical thinking, and

collaborative learning. Thus, students receive a comprehensive and dynamic education that prepares them for a sustainable and successful professional career.

Reflective Practice

1. Considering your personal characteristics and teaching style, which two small-group teaching methods do you believe would best align with your approach to instruction? Explain how these methods complement your strengths and preferences as an educator.
2. Reflecting on the content of the seminar “Introduction to the Pediatric Dentistry Clinic – Phantom Course: Ergonomics” and taking into account the needs and characteristics of your specific group of dental students, which two small-group teaching methods do you consider most effective for achieving the learning objectives of the seminar?

3.4. Application of Augmented and Virtual Reality to Improve the Quality of Learning

Ani Epitropova

The integration of **Augmented Reality (AR)** and **Virtual Reality (VR)** into small-group teaching has emerged as a modern and evidence-based approach to enhancing the quality and effectiveness of higher education. These technologies provide immersive and interactive learning environments that bridge theoretical knowledge and practical experience, particularly in clinical and health education contexts.

Some of the key characteristics related to the integration of AR and VR are as follows:

1. Augmented Reality (AR):

- Augmented Reality overlays digital information onto the real environment, typically through a device such as a smartphone or tablet.
- It enhances the user’s perception of reality by adding digital elements—such as images, videos, or 3D models—to the physical surroundings.
- AR allows users to interact with virtual objects in real time, providing an engaging and interactive experience that promotes active learning.

2. Virtual Reality (VR):

- Virtual Reality creates a fully immersive digital environment that simulates either real-world or imagined settings.
- Users wear VR headsets that block out the physical environment, transporting them into a computer-generated space.
- VR technology enables users to explore and interact with virtual objects or scenarios as if they were physically present, fostering experiential learning and deep understanding

Task: Exploring the benefits of AR and VR in dentistry and dental Education

In the effort to integrate innovative technologies into the learning process, your first task is to watch the video by Digital Dental Academy (2023) titled “Update of AR and VR in Dentistry and Dental Education”, available at the following link: <https://youtu.be/JuuaMapR6I4>

After viewing the video, compile a list of the main advantages that Augmented Reality (AR) and Virtual Reality (VR) environments offer to students in the field of dental education. Pay particular attention to how these technologies:

- enrich the learning process through enhanced visualization of dental procedures;
- provide interactive learning opportunities and a safe environment for practical application;
- offer personalized feedback;
- increase the accessibility and flexibility of learning;
- stimulate innovation and student engagement.

Finally, write a brief reflective response on how AR and VR technologies contribute to the development of professional competences and critical thinking among dental students.

Benefits of AR and VR in Dental Education

The advantages associated with Virtual Reality Interactive Simulations (VRIS) include the provision of immediate feedback, reduced task completion time, increased confidence and motivation, accelerated acquisition of practical skills, improved performance outcomes, and higher engagement in the learning process (Mai et al., 2025).

- **Enhanced Visualization:**

Augmented and Virtual Reality technologies provide students with realistic visualizations of dental anatomy, clinical procedures, and patient scenarios, thereby facilitating deeper understanding and long-term retention of complex concepts.

- **Interactive Learning:**

Students can actively interact with virtual dental instruments, equipment, and patient cases, practicing clinical actions in a safe, risk-free environment that promotes experiential learning.

- **Skill Development:**

Virtual simulations offer opportunities to refine clinical skills and build confidence before students begin real-world interactions with patients.

- **Flexibility and Remote Learning:**

AR and VR modules are accessible online, enabling students to continue their studies beyond the traditional classroom or clinical setting, promoting autonomy, adaptability, and lifelong learning habits.

- **Development of Communication and Empathy:**

Recent studies in pediatric dental education highlight the key role of VR in developing effective communication and behavioral management skills when working with children. The three-year cohort study by Hu and Lai (2025) demonstrated that immersive VR scenarios help students adopt the child-patient’s perspective, fostering higher levels of empathy, reducing anxiety, and increasing confidence in interactions with young patients.

Such training not only facilitates the acquisition of knowledge and practical skills but also contributes to a sustainable transformation of professional attitudes and competences. In this regard, virtual reality is emerging as a strategic tool for improving the quality of dental education and for setting higher standards in health education and professional preparation.

To gain a deeper understanding of the technical requirements related to the implementation of Augmented Reality (AR) in education, the video “*AR Equipment Tutorial*” available on YouTube (<https://www.youtube.com/watch?v=q2B4aYBEYeQ>) can be used. Presented by VR Tech Academy (2022), the video explains the main components of AR equipment, including the use of AR glasses or headsets, mobile devices with compatible operating systems, and specialized visualization software — all of which are essential for the effective integration of AR technologies in the learning process. The next step involves applying theoretical knowledge through a practical example of how AR and VR technologies can be integrated into a seminar titled “Introduction to the Pediatric Dentistry Clinic – Phantom Course: Ergonomics.”

Theoretical Component

In the field of pediatric dentistry, the use of Virtual Reality (VR) has proven to be a promising approach for managing children’s behavior during dental procedures. Research shows that VR environments reduce anxiety, fear, and pain perception in young patients while enhancing cooperation and engagement in treatment processes (Barros Padilha et al., 2023). Other authors emphasize that VR distraction techniques significantly decrease acute pain and stress during medical interventions in children, making VR a suitable tool for use in dental practice as well (Lambert et al., 2020).

Practical Task: Application of Virtual Reality (VR) in Pediatric Dentistry

Instructions:

1. Analysis of Benefits and Limitations:

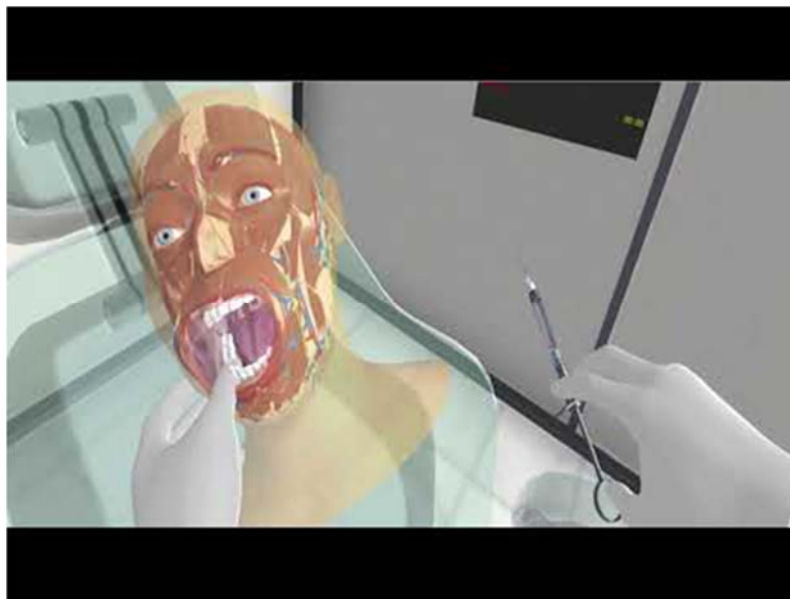
Prepare a T-chart outlining the key advantages and disadvantages of using Virtual Reality (VR) for managing children’s behavior during dental procedures.

2. Evaluation of Scientific Evidence:

Assess which of the two studies — Barros Padilha et al. (2023) or Lambert et al. (2020) – provides a stronger evidence base. Justify your evaluation by referring to research methodology, sample size, and the applicability of results.

3. Practical Application:

Use VR overlays to demonstrate proper body positioning and ergonomic posture during a practical training exercise. Then, watch the video “*NYU VR Local Anesthesia Simulation (Promo Video)*”, available at: <https://www.youtube.com/watch?v=JZVWIsUCGjU>.



According to the New York University College of Dentistry (2023), the use of VR simulations in local anesthesia training supports the development of proper clinical techniques, fine motor control, and spatial orientation among students, while providing a safe and controlled environment for practicing clinical procedures effectively.

Sample Activity: Implementing the *Arloopa* Application in Higher Education Seminars

Purpose and Overview

This section provides practical guidance for university lecturers on how to effectively integrate the *Arloopa* augmented reality (AR) application into seminar and practical teaching

sessions. The activity aims to demonstrate how *Arloopa* can enhance engagement, visualization, and experiential learning in dental and health education.

1. Preparation Before the Seminar

To ensure a smooth and interactive learning experience, follow these preparatory steps:

Equipment Required:

- Multimedia projector or smart display, a computer/laptop, and smartphones (one per student or per group).

Install and Test the Application:

- Download Arloopa from the official app store on all seminar devices.
- Open the app to verify that it runs properly and that the camera permissions are enabled.

Familiarize Yourself with the Interface:

- Before the session, explore the Arloopa dashboard and navigation menus.
- Review Interface and Functions of Arloopa for step-by-step visual guidance.

Prepare Learning Materials:

- Identify or upload suitable AR resources (e.g., anatomical models, 3D dental structures, patient simulations).
- Ensure that printed or digital markers are available for scanning—these are essential for activating AR objects.

2. Conducting the Seminar Session

2.1. Introduction and Orientation:

- Begin by explaining the goal of using Arloopa—to visualize complex dental or health-related concepts through AR.
- Demonstrate how to open the app and navigate the main interface.

2.2. Exploring the Interface:

- Home Screen: Acts as the central hub, displaying available AR/VR experiences and educational categories.
- Search Bar: Allows quick access to specific modules by topic (e.g., “oral anatomy,” “ergonomics”).
- Navigation Tools: Demonstrate one function live before students begin.

2.3 Student Activity:

- Ask students to scan the designated AR marker using their smartphones.
- Guide them to observe and manipulate the 3D object (rotate, zoom, or interact).

- Encourage discussion on how the visualized structure relates to clinical or theoretical concepts.

2.4 Collaborative Exploration:

- Form small groups (3–5 students) to explore different modules.
- Assign each group a focus area—for example, dental anatomy, ergonomic posture, or pediatric patient scenarios.
- Ask each group to summarize and present their findings briefly to peers.

3. Integration of Arloopa Features into Learning Outcomes

- **Visualization and Conceptual Understanding:** Helps students connect theoretical material with real-world contexts by displaying dynamic 3D content.
- **Active Participation:** AR interaction increases engagement and encourages peer discussion.
- **Reflection:** After the session, ask students to describe how AR visualization improved their understanding or recall of the topic.
- **Assessment:** You may use short polls or reflection questions to collect feedback on the usefulness of the AR activity.

4. Tips for Lecturers (Non-IT Specialists)

- Start with one simple AR module before introducing multiple features.
- Always test the app and marker recognition in advance.
- Keep printed instructions or QR codes ready for students who encounter technical issues.
- Encourage students with stronger digital skills to assist peers (“digital buddies”).
- Reflect on how the use of AR influenced student engagement and adapt future sessions accordingly.

Summary

The *Arloopa* app offers an accessible, intuitive way to incorporate augmented reality into university-level teaching. By following this structured approach—preparation, demonstration, guided exploration, and reflection—lecturers can transform traditional seminars into immersive learning experiences without needing advanced IT expertise.

Reflective Practices

1. As a university lecturer, what changes do you anticipate that augmented reality (AR) and virtual reality (VR) will bring to traditional teaching methods and interaction with students?
2. In your role as an educator and researcher, how would you strategically integrate AR and VR technologies into your curriculum to enhance learning effectiveness, practical training, and student engagement?

CHAPTER THREE

4. Assessment in the Academic Environment

4.1. Exploring Best Practices in Assessment

Ani Belcheva

Intended Learning Outcomes

- Develop a deeper understanding of assessment practices aligned with higher education teaching methodologies.
- Acquire skills to integrate digital tools and artificial intelligence (AI) for more effective and objective assessment methods.
- Gain access to additional reading materials to deepen understanding and stay informed about emerging trends in assessment.

Session Overview

This session aims to equip lecturers with the knowledge and tools to enhance their assessment methods through the integration of digital technologies, artificial intelligence, and evidence-based strategies. It provides practical insights into contemporary and innovative assessment practices in higher education and explores new trends in the field.

Session Structure

4.1 Exploring best practices in assessment

4.2 Integrating digital tools and AI for effective assessment methods

4.3 Examining innovations in assessment: using digital tools and AI for improved outcomes

4.4 Sample tests developed with ChatGPT

In the educational context, *best practice* refers to a set of proven methods, techniques, or strategies that have been demonstrated to effectively support learning, student achievement, and overall educational outcomes. These practices are typically based on research, evidence, and professional experience and are widely recognized within the academic community for their positive impact on teaching and learning. Best practices may encompass a range of instructional approaches, assessment strategies, management techniques, and professional development methods that foster engagement, motivation, and student success.

One of the goals of the project is the exchange of best practices among partner institutions. In this regard, we are pleased to share that the Department of Pediatric Dentistry at the Faculty of Dental Medicine, Plovdiv has developed exemplary assessment practices for evaluating

students. These practices adhere to academic standards, making them particularly relevant for consideration in this section.

ACADEMIC STANDARD FOR THE DISCIPLINE “PEDIATRIC DENTISTRY”

Assessment

Students are expected to engage in dynamic and intensive learning throughout the semester. The underlying assumption is that the method by which knowledge and skills are acquired is a crucial factor in determining their depth, durability, and applicability. Continuous assessment of students’ knowledge is conducted through seminars, colloquia, and tests during the semester. Evaluation of clinical performance is carried out through **practical supervision**, held at the end of the 10th semester. Students receive timely feedback and clarification of their performance results (typically during the following class session) to support their ongoing preparation and learning progress.

The results of these evaluations form an integral part of the final semester grade, which is recorded in each student’s personal academic file.

1. Independent Study and Extracurricular Student Work

Independent study is guided by the academic instructor, who directs students toward appropriate literature sources and effective methods of learning. Students are provided with training tests, tasks for developing preventive programs, and clinical case studies (in both printed and digital formats) for self-directed learning, practice, and preparation for semester and state examinations.

2. Collaboration Between Lecturers and Students

This collaboration is expressed through:

- Active lecturer engagement with students’ learning process, including attention to prior preparation, current learning challenges, and opportunities for improved results through an individualized learning plan;
- Providing designated consultation hours;
- Involving students in research teams, academic projects, and scholarly initiatives;
- Organizing and conducting student clubs focused on various thematic areas.

3. Examinations

In the Department of Pediatric Dentistry, the assessment of students' acquired knowledge and skills is carried out through:

Ongoing Assessments

As outlined in the curriculum for the respective discipline, ongoing assessments are awarded for:

- Student performance during seminars, clinical exercises, coursework, and independent assignments, as well as participation in research activities and academic projects conducted jointly with faculty members;
- Seminars, colloquia, tests, and practical supervision sessions included in the study plan.

Course Examination

A formal examination in the discipline is conducted to assess the overall theoretical and practical knowledge acquired during the semester.

State Examination in Pediatric Dentistry

The State Examination in Pediatric Dentistry is held after successful completion of the pre-diploma internship, marking the culmination of the student's academic and clinical preparation.

Assessment Standards

Successful completion of the courses offered by the Department of Pediatric Dentistry is determined through a composite evaluation system consisting of two main components:

- First Component (up to 30%) – Represents the student's academic performance throughout the semester, including results from ongoing assessments (seminars, colloquia, and tests) and practical work (applicable to Pediatric Dentistry – Part II and the pre-diploma internship in the sixth year).
- Second Component (up to 70%) – Represents the final examination grade in the respective discipline.

The exam regulations are designed to ensure objectivity and minimize the possibility of manipulation or bias in the evaluation process. Clear assessment standards are developed to maintain transparency, fairness, and alignment with the academic and clinical objectives of the program.

The final grade reflects the extent to which a student has achieved the learning objectives established at the beginning of the course. It is multicomponent, comprising:

- the ongoing assessment,
- the written final examination, and/or
- the oral final examination.

The final grade is calculated as a sum of six-point scale scores from different components: ongoing assessment, written test, clinical task/preventive program, written exam, and oral exam.

If any component of the final exam is graded Fail (2), the overall final grade is automatically Fail (2).

The specific components contributing to the overall grade for each discipline are determined by the Departmental Council, in accordance with the academic standard of the discipline.

Development of Lifelong Learning Competence

The development of lifelong learning competence requires the intentional cultivation of self-assessment and reflective skills. According to Dahllöf, “educating students to be critical of knowledge, to reflect on learning from their own experience, and to take personal responsibility for lifelong learning are important goals of dental education” (Dahllöf, Tsilingaridis & Hindbeck, 2004).

The authors’ study demonstrates that the use of a logbook as a tool for continuous self-assessment fosters self-reflection and awareness of personal strengths and weaknesses in clinical training. As a result, students become more confident in analyzing their own practice and perceive teacher feedback as more constructive, thus supporting their development as self-regulated and responsible professionals.

Experience shows that logbooks are not always optimally utilized in clinical education. According to the study by Schüttpelz-Brauns et al. (2016), the successful implementation of logbooks in a clinical setting requires careful change management, a clear educational concept, and the integration of the logbook into the curriculum as part of a systematic competence development process. The authors emphasize that the effectiveness of this tool depends on how the logbook itself is designed, the conditions of clinical training, and the instructors’ readiness to provide ongoing support and guidance.

In conclusion, logbooks can serve as a valuable tool in clinical education, especially when training takes place across multiple clinical sites—provided that the recommended best practices and implementation guidelines are followed (Schüttpelz-Brauns et al., 2016).

The Department of Pediatric Dentistry at the Faculty of Dental Medicine, Plovdiv, has implemented exemplary practices in this regard by providing each student with two types of logbooks – TETRADKA_FANTOM_Engl_2023 (1).pdf and Clinical Notebook pp.pdf. Encouraging reflective learning and self-assessment skills is crucial in dental education to

promote lifelong learning among future dentists and ensure their continuous professional development.

Reflective Practices

Reflect on your current assessment methods and approaches used in your teaching practice and answer the following questions:

1. Which aspects of your assessment methods do you consider most effective, and why?
2. Which areas of your assessment practices could be enhanced or improved?
3. How could you use feedback from assessments to improve your teaching strategies and student learning outcomes?

4.2. Integrating Digital Tools and Artificial Intelligence for Effective Assessment Methods

Ani Epitropova

In higher education, digital tools for creating tests, surveys, and formative assessments offer broad opportunities to enhance teaching and learning processes. These tools are valuable in both in-person and virtual learning environments, allowing educators to adapt assessment methods to course content and students' individual needs. They provide flexibility, traceability, and efficiency by enabling easy content updates, quick data collection, and automated result analysis.

Integration of Artificial Intelligence in the Assessment Process

Recent technological advancements have significantly improved academic evaluation through the integration of Artificial Intelligence (AI) into assessment platforms. AI-driven tools can analyze student responses quickly and accurately, providing instant and personalized feedback that highlights both strengths and areas for improvement. This saves instructors' time and fosters individualized learning aligned with different learning styles and paces.

In dental education, research has shown that using ChatGPT as a tool for assessment and feedback is particularly promising. According to Wada et al. (2024), AI demonstrates strong reliability in grading written assignments and can effectively complement traditional methods when applied alongside well-defined rubrics and human supervision. Similarly, Goh et al. (2024) report that incorporating ChatGPT into dental courses improves self-reflection and student engagement, motivating learners to participate more actively in the educational process.

The integration of AI also enables adaptive learning strategies, where systems analyze student performance and dynamically modify tasks or content according to learners' needs. This dual benefit allows instructors to gain deeper insights into group trends, while students receive personalized competence development pathways.

By employing these tools, educators can streamline the creation, administration, and evaluation of exams, freeing valuable time for core academic and research activities.

Examples of Assessment Tools in Higher Education

1. **Google Forms (2025)** – A versatile tool for creating surveys, quizzes, and forms that integrates seamlessly with Google Drive. It supports automatic data collection and result analysis, making it ideal for fast, efficient knowledge checks. <https://docs.google.com/forms>
2. **Moodle (2025)** – An open-source learning management system offering diverse assessment features such as quizzes, assignments, and interactive tasks. Its integration within the curriculum facilitates progress tracking and continuous feedback. https://docs.moodle.org/403/en/About_Moodle
3. **Quizizz (2025)** – An interactive quiz platform that encourages engagement through gamified elements. It provides immediate feedback and supports both individual and group testing modes. <https://sites.google.com/quizizz.com/quizizz-u-forschoolsdistricts/on-demand-resources>
4. **Socrative (2025)** – A real-time assessment tool for creating quizzes and polls with instant results. It is particularly useful for knowledge diagnostics and enhancing interactive communication between teachers and students. <https://www.socrative.com/higher-ed/>
5. **Kahoot! (2025)** – A game-based assessment platform that boosts student engagement through competitive learning formats, ideal for interactive lectures and seminars. <https://kahoot.com/>
6. **ClassMarker (2025)** – A professional online testing platform with strong security features. It enables automatic grading and rapid summarization of results, optimizing instructors' time and ensuring data reliability. <https://www.classmarker.com/>
7. **Microsoft Forms (2025)** – A user-friendly platform within Microsoft Office 365 for creating quizzes, surveys, and feedback forms. It offers customizable templates and diverse question types, making it highly adaptable for academic environments. <https://forms.microsoft.com>

The use of digital tools and artificial intelligence in assessment significantly enhances the quality of teaching and learning in higher education. These technologies facilitate accurate and timely feedback, support personalized learning, and optimize faculty workload. Their integration not only improves competence measurement but also contributes to the creation of a more effective, engaging, and equitable learning environment, aligned with modern standards of higher education and professional training.

4.3. Exploring Innovations in Assessment: Using Digital Tools and Artificial Intelligence for Better Outcomes

Ani Epitropova

The rapid advancement and widespread adoption of Internet and communication technologies (ICT), together with the expansion of big data analytics and the emergence of the Internet of Things (IoT), have collectively formed a complex network of interconnected phenomena that deeply influence modern society. At the heart of these transformative developments stands a particularly powerful driver of technological innovation – the integration of Artificial Intelligence (AI) in education. This field has seen a remarkable surge in research and publications, emphasizing its growing significance and potential impact on educational practices.

In response to these developments, on February 19, 2024, the Bulgarian Ministry of Education and Science (MES) published an important policy document titled “Guidelines for the Use of Artificial Intelligence in the Educational System.” The document, available on the official MES website, provides educators with practical recommendations for integrating and utilizing AI technologies in educational settings. It draws upon materials developed by the MES, as well as resources from international educational institutions, regional administrative bodies, and expert organizations from various countries.

The guidelines outline the potential applications of AI tools and offer ethical principles for their responsible use. The document highlights the importance of avoiding overreliance on AI technologies and instead promotes their use as supportive tools that allow educators to dedicate more time to personalized student engagement.

The creation of these national guidelines marks the first step in a long-term process, driven by the dynamic evolution of AI technologies. It is essential, however, to initiate this process with systematic and transparent communication that dispels common misconceptions and reaffirms a fundamental truth – technology can never replace the educator. Nevertheless, when used appropriately, AI can enhance and support the educator’s work, enriching the teaching and learning process.

AI in Assessment and Educational Practice

In the context of assessment, Artificial Intelligence is already making significant strides through applications such as intelligent tutoring systems, automated grading tools, and personalized learning platforms. These systems hold immense potential to improve learning outcomes and empower educators to deliver customized instruction.

For example, intelligent tutoring systems can provide personalized feedback and guidance, dynamically adapting instructional strategies to individual learner needs. Automated

grading systems streamline the evaluation process, freeing academic staff to focus on research, publication, and direct student interaction.

The integration of AI tools in higher education should be seen as a comprehensive, cyclical “design assessment” process, in which AI supports rather than replaces the instructor. To ensure effectiveness and fairness, this process must be grounded in an ethical framework, ensuring algorithmic transparency, data protection, and bias mitigation. Developing AI literacy among both students and educators is key to achieving sustainable, responsible use of AI technologies (Luo et al., 2025).

Based on a systematic literature review, Luo and colleagues (2025) make the following recommendations:

- Design AI systems with multimodal content, transparent logic, inclusivity, and ethical safeguards (bias reduction, privacy, and data security).
- Conduct rigorous, evidence-based evaluations, using randomized designs in authentic educational contexts across disciplines to measure both short- and long-term outcomes.
- Ensure explainability and accountability, clarifying how systems operate and who is responsible for oversight, while maintaining compliance with legal and human rights frameworks.
- Develop AI literacy among all participants so that AI functions as an ally in personalized learning and effective assessment.

Ethical Implementation and Educational Value

According to Adiguzel, Kaya, and Cansu (2023), AI tools – including chatbots and large language models (LLMs) – hold vast potential to enrich the educational process. However, the authors emphasize that implementation must adhere to principles of ethical responsibility and transparency, ensuring that AI technologies provide genuine benefits for both educators and learners.

Launched by OpenAI (San Francisco, California) in November 2022, ChatGPT describes itself as “a powerful machine learning software using the Generative Pre-trained Transformer (GPT) algorithm to generate human-like text responses.” The GPT architecture belongs to a class of advanced language models that leverage deep learning and massive datasets to generate coherent, contextually relevant responses. By identifying linguistic patterns and relationships, GPT models can produce meaningful text or visual outputs in response to user prompts.

ChatGPT can perform a wide range of tasks — including language translation, text summarization, question answering, creative writing (such as poetry or narrative text), and

high-quality content generation (e.g., blog articles or instructional materials). It can also explain complex academic concepts, revise or debug code, and create new scripts.

In education and training, ChatGPT can be used to:

- Develop personalized learning materials and lesson plans tailored to individual learner needs and preferences.
- Provide real-time feedback and guidance during the learning process.
- Generate engaging educational content, including quizzes, interactive exercises, and multimedia presentations.
- Assist educators with grading assignments and offering constructive feedback.
- Create adaptive learning environments that respond to learner progress and performance (Ray, 2023).

According to Ray (2023), ChatGPT enables personalized learning by analyzing data on students' preferences, strengths, and weaknesses, and by offering targeted recommendations for materials and activities that improve academic achievement and engagement. Furthermore, it can support educators by suggesting teaching plans, instructional strategies, and classroom management techniques. During exam preparation, ChatGPT can propose study materials and individualized learning strategies based on student progress and results.

Its ability to understand natural language input and generate human-like responses makes ChatGPT a popular educational tool for quickly addressing questions across a wide range of topics — from general knowledge to specialized professional content. For example, it can instantly summarize a lengthy academic article into a single sentence.

For university educators, ChatGPT can also assist in creating test questions or exam materials when provided with relevant course data such as lecture notes, presentations, or reference texts. Access to the system is available through registration at www.chat.openai.com.

4.4. Creating Effective Tests Using ChatGPT — Step-by-Step Guide

Ani Belcheva

Define Learning Objectives and Question Types

Before generating test questions, identify the key concepts, skills, or competencies you want to assess. Make a list to clarify what each question should target. Choose the question format (e.g., multiple choice, short answer, essay) that aligns with your learning goals. ChatGPT can assist with multiple-choice (MCQ), true/false, and open-ended questions.

Generate Content-Specific Questions

Provide ChatGPT with relevant content — excerpts from lecture notes, textbook chapters, or learning materials related to the test. You can do this in parts, focusing on one topic at a time. Ask ChatGPT to generate questions from the material. Be specific about the type, e.g.: “Generate five multiple-choice questions based on this material.”

“Create open-ended questions that assess critical understanding of these concepts.” ChatGPT can adapt the questions to different cognitive levels (e.g., recall, analysis, synthesis) depending on how you phrase your prompt.

Customize Instructions and Answer Formatting

When creating multiple-choice questions, specify the number of answer options (e.g., four) and request realistic distractors (plausible incorrect answers). Example formatting prompts: “Provide answer options (A, B, C, D) for each question.”, “Use a direct question format focusing on key concepts.”

Review and Refine the Generated Questions

Review each question for accuracy, relevance, and clarity. ChatGPT’s suggestions may require adjustment to meet your academic standards. Edit questions to ensure they avoid ambiguity and precisely align with learning objectives.

Generate Suggested Answers and Explanations (Optional)

If desired, ask ChatGPT to provide correct answers and short explanations for each question. This helps create answer keys or study guides. Example: “List the correct answers with brief explanations for each of the questions above.”

Request Variations for Practice or Multiple Test Versions

If you need multiple versions of the same test, ask ChatGPT to create question variants on the same topics. This helps reduce cheating risks while maintaining consistent difficulty across test versions.

Example:

A lecture on pediatric dentistry is converted into a text file or chapter from a textbook and pasted into ChatGPT.

In ChatGPT, you prompt: “Create X multiple-choice questions based on this text.”

ChatGPT generates X questions.

You review the output and, if needed, ask the chatbot to revise, reword, make questions more complex or simpler, or adjust the number of answer choices.

Other tools for test and questionnaire creation following a similar workflow are described in Section 4.2 – Integrating Digital Tools and AI for Effective Assessment Methods.

Sample Questionnaire (Created by ChatGPT)

1. How does AI contribute to the transformation of education according to the text?
 - a) By reducing the role of teachers in the classroom
 - b) By providing new tools and applications that can revolutionize traditional teaching and learning methods
 - c) By increasing educational costs
 - d) By limiting access to educational resources
2. What is one potential application of AI in education mentioned in the text?
 - a) Remote tooth extraction
 - b) Personalized educational platforms
 - c) Bridge construction
 - d) Road maintenance
3. What ethical issue is raised regarding the use of AI in education?
 - a) Expanded access to educational resources
 - b) Possible reinforcement of existing inequalities in the education system
 - c) Reduced reliance on traditional teaching methods
 - d) Improved student collaboration
4. What is highlighted as a requirement for the successful integration of AI in pedagogical practice?
 - a) Lack of teacher training and support
 - b) Increased funding for educational technologies
 - c) Decreased student engagement
 - d) Students' unwillingness to adapt to new technologies

Sample Test Created with ChatGPT

Multiple-Choice Questions:

1. Which term originates from the Greek words meaning “work” and “natural law”?
 - A) Anthropometry
 - B) Ergonomics
 - C) Biomechanics
 - D) Kinematics

Correct answer: B) Ergonomics

2. What percentage of dentists are reported to work in a seated position during procedures?

- A) 20%
- B) 40%
- C) 60%
- D) 80%

Correct answer: B) 40%

3. Which posture is associated with better direct and indirect visualization in dentistry?
- A) Standing position
 - B) Seated position with the patient lying flat
 - C) Seated position with the patient semi-reclined
 - D) Sitting on the dental chair

Correct answer: C) Seated position with the patient semi-reclined

4. In four-handed dentistry, which zone is primarily designated for the assistant?
- A) Operator's zone
 - B) Transfer zone
 - C) Assistant's zone
 - D) Static zone

Correct answer: C) Assistant's zone

5. Which position is recommended for better access to the lingual and proximal surfaces of upper premolars and molars?
- A) 8–9 o'clock
 - B) 10–11 o'clock
 - C) 12 o'clock
 - D) 3 o'clock

Correct answer: A) 8–9 o'clock

6. What angle is recommended for the knees and hips to maintain a healthy working posture for dentists?
- A) 45
 - B) 90°–125°
 - C) 180°
 - D) 360°

Correct answer: B) 90°–125°

7. Which posture is associated with a reduced risk of accidental ingestion of micro-instruments?
- A) Standing position

- B) Sitting on the dental chair
- C) Sitting with the patient lying flat
- D) Sitting with the patient semi-reclined

Correct answer: D) Sitting with the patient semi-reclined

8. What is the main disadvantage of working in a seated position with the patient lying flat?
- A) Reduced access to lingual surfaces
 - B) Increased risk of back pain
 - C) Risk of accidental ingestion of micro-instruments
 - D) Need for magnifying loupes

Correct answer: A) Reduced access to lingual surfaces

9. Which position is recommended for better access to buccal, proximal, and occlusal surfaces of lower premolars and molars?
- A) 7–8–9 o'clock
 - B) 10–11 o'clock
 - C) 12 o'clock
 - D) 3 o'clock

Correct answer: A) 7–8–9 o'clock

10. What is the main purpose of ergonomic considerations in dentistry?
- A) Maximizing patient discomfort
 - B) Minimizing efficiency
 - C) Reducing practitioner fatigue and injuries
 - D) Limiting patient access to care

Correct answer: C) Reducing practitioner fatigue and injuries

Open-Ended Questions:

1. Can you explain the concept of ergonomic positions in dentistry and why they are important for both practitioners and patients?
2. What are some potential risks associated with non-ergonomic postures in dental practice, and how might they affect the health and well-being of dental professionals?
3. Describe the operating zones in four-handed dentistry and their respective roles for dentists and assistants.
4. How does working in segments facilitate dental procedures, and what considerations should be made when treating different areas of the mouth?

5. Discuss the key components of a healthy working posture for dentists and how proper ergonomics contribute to overall well-being and productivity.
6. What strategies can dental professionals use to minimize the risk of work-related musculoskeletal disorders in their practice?
7. How do ergonomic principles in dentistry align with patient-centered care and safety standards?
8. Can you elaborate on the challenges associated with indirect visualization during dental procedures and how practitioners can overcome them?
9. How do ergonomic principles influence the design and layout of dental workspaces and equipment?
10. In what ways can dental assistants contribute to maintaining ergonomic best practices in the dental office, and what role do they play in ensuring practitioner comfort and efficiency?

Conclusions and Recommendations -Transformative Teaching for the Future

Teaching in higher education is an ambitious, complex, and often challenging task that many faculty members undertake without formal pedagogical preparation or structured orientation. The transition from being a disciplinary expert to becoming an effective academic educator requires not only mastery of the subject matter but also a deep understanding of how students learn, interact, and construct knowledge. In modern universities, faculty are expected to perform multiple and interrelated roles — as curriculum and course designers, role models, resource creators, information providers, facilitators, and assessors. Balancing these responsibilities requires pedagogical awareness, reflective practice, and openness to innovation.

The Needs Analysis conducted during the preparation of this Faculty Guide revealed a clear trend: most lecturers who are not trained pedagogues believe that the most important professional quality is to know the content of the academic subject they teach, often underestimating the importance of teaching strategies and methods. This finding highlights the urgent need for continuous pedagogical support and training tailored to the specific contexts of higher education. It also underscores the relevance of this Guide as a resource for developing faculty competences and bridging the gap between disciplinary expertise and effective teaching.

The Faculty Guide aligns with several strategic objectives that define both its structure and purpose:

- To encourage academic educators to pursue ongoing professional development and training, foster collaboration, and implement innovations in their teaching practice.

- To promote the shift towards Competency-Based Higher Education (CBHE), where learning outcomes, assessment, and teaching align with professional standards and real-world applications.
- To foster innovation and creativity in teaching methodologies by implementing evidence-based approaches and sharing best practices across disciplines.

Modern higher education institutions must cultivate environments that empower educators to experiment, collaborate, and reflect. Transformative teaching involves shifting the focus from knowledge transmission to knowledge creation — where students actively engage in problem-solving, interdisciplinary learning, and critical reflection. Integrating digital tools, simulation technologies, and AI-assisted methods not only enhances flexibility and personalization but also contributes to ethical, inclusive, and student-centered learning experiences.

Feedback from the participating academic staff in pilot sessions was positive, emphasizing the clarity, structure, and relevance of the materials presented in this Faculty Guide. Participants reported improved understanding of innovative teaching methods, greater motivation to redesign their courses, and a strengthened sense of professional identity as educators committed to excellence.

In conclusion, this Faculty Guide serves as both a practical tool and a conceptual framework for transforming teaching and learning in higher education, particularly in dental and health education. By embracing competence-based design, reflective practice, and technological innovation, academic educators can build sustainable, engaging, and future-oriented learning environments that prepare students not only to succeed academically, but also to act responsibly in professional and societal contexts.

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