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Teaching doctoral students: Best practices for modern education

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Abstract

This article presents a piloting of a comprehensive proposal for teaching the course Didactics of Higher Education, specifically designed and conducted at the Doctoral School at the University of Silesia. The course integrates best practices acquired by the authors during the project Masters of Didactics (MoD) and its advanced track – the Masters of Didactics – Advanced Teaching Qualifications. The practices have been successfully adapted from renowned institutions, including Aarhus University (Denmark), Ghent University (Belgium) and University College London (Great Britain). The proposal emphasizes the innovative combination of pedagogical methods (i.e., team-based learning (TBL), assessment and feedback and gamification), aiming to equip future educators with the skills necessary to excel in modern academic environments. By fostering a deep understanding of effective teaching methods, the course's objective is to prepare doctoral students to become leaders in higher education attentive to diverse students' needs,

capable of enhancing learning outcomes and contributing to the advancement of educational standards.

Keywords

Masters of Didactics (MoD), Best practices in didactics, Higher Education Teaching Methods, Doctoral School, interdisciplinarity.

Kształcenie doktorantów: najlepsze praktyki nowoczesnej edukacji

Abstrakt

Niniejszy artykuł przedstawia pilotaż modelu nauczania przedmiotu Dydaktyka szkoły wyższej, zaprojektowany dla i zrealizowany w Szkole Doktorskiej na Uniwersytecie Śląskim. Kurs jest próbą integracji najlepszych praktyk zdobytych przez autorów podczas uczestnictwa w projekcie Mistrzowie Dydaktyki (Masters of Didactics) i w jego zaawansowanej ścieżce – Mistrzowie Dydaktyki – program zaawansowany (Masters of Didactics in Excellent Teaching). Praktyki te zostały z powodzeniem zaadaptowane z renomowanych ośrodków akademickich, takich jak Aarhus University (Dania), Ghent University (Belgia) i University College London (Wielka Brytania). Model kładzie nacisk na innowacyjne metodologie pedagogiczne (tj. nauczanie zespołowe, ocenianie i informację zwrotną oraz grywalizację), mając na celu wyposażenie przyszłych nauczycieli w umiejętności niezbędne do doskonalenia się w nowoczesnych środowiskach akademickich. Poprzez wspieranie dogłębnego zrozumienia skutecznych metodologii nauczania, celem kursu jest przygotowanie doktorantów do roli liderów w szkolnictwie wyższym, zdolnych do poprawy wyników nauczania i przyczynienia się do rozwoju standardów edukacyjnych.

Słowa kluczowe

Mistrzowie Dydaktyki, najlepsze praktyki, dydaktyka szkoły wyższej, Szkoła Doktorska, interdyscyplinarność

1. Introduction

The beginning of the 21st century brought a revolution of didactics, which has evolved significantly, particularly in higher education (HE). The objective of modern didactics goes beyond passive transmission of knowledge and promotes students' autonomous, critical, and reflective learning. Such transformation is driven by the need to adapt to rapid technological advancements, changing societal needs, and diverse profiles of students. Modern education emphasises active participation, critical thinking, and the application of knowledge in real-world contexts. Universities and teachers need to increase the efficiency of the teaching process and ensure alignment with the latest knowledge and practices. This includes eliminating traditional, transmissive teaching methods and developing new methods linking theory with practice (Chodisetty et al. 2024).

A few crucial pillars of modern didactics can be pointed out, as noted below. Active learning (AL) is a cornerstone of modern didactics, involving students as active participants rather than passive recipients of information. AL methods include class discussions, simulations, games, and group work, the role of which is to improve student performance and motivation, and develop higher-level thinking skills. In the classroom, the implementation of AL relies on two key factors – the educator commitment and student buy-in. Teachers' optimistic and proactive attitude in adopting these methods is a key aspect, yet student engagement is crucial. It is their participation and enthusiasm that significantly impact the success of AL initiatives (Yidana and Darkwa 2024).

The fourth industrial revolution, characterised by a fusion of technologies, accompanied by the COVID pandemic, led to the rapid emergence of a new information society that requires innovative learning environments based on the use of remote learning tools, global information networks, and mass communication technologies not only to facilitate remote learning, but also improve accessibility, and enhance the learning experience through combining physical and virtual elements. These envi-

ronments might be an excellent answer to the diverse needs of students and can offer flexible learning opportunities (Gejdoš 2019). Technology provides tools and platforms that facilitate personalized learning experiences, provide access to vast resources, and opportunities for virtual collaboration. Online learning platforms, interactive multimedia content, and digital assessment tools enable educators to tailor instruction to individual student needs, foster active learning, and provide timely feedback.

The necessity of lifelong learning (LLL) also emerged from the rapid development of science and technology. Modern didactics plays a crucial role in fostering this process by providing flexible and comprehensive educational opportunities.

The connection between education and the real world requires preparing students for the workplace by developing their social and cultural capital. The labour market's evolving needs require a range of soft skills, including creativity/innovation skills, analytical skills, and continuous improvement skills (Chiu et al. 2024). Engaging in pedagogies incorporating career and employability learning enhances students' well-being and a sense of belonging, helping students develop critical thinking skills, confidence, and professional identities and facilitating their entry into independent adult lives (Cooke et al. 2024). That is why modern methods emphasise development of communication skills, both verbal and written. In the present era of global interconnectivity, effective communication is essential for a success in nearly every domain. Educators are integrating activities and assignments that require students to articulate their ideas clearly, engage in meaningful discussions, and communicate their findings persuasively.

The article presents an example of an instructional course delivered to the students of the doctoral school at the University of Silesia, highlighting the nature of pedagogical innovation. The authors of the paper, through their participation in the Masters of Didactics project (MoD), developed and financed by the Ministry of Science and Higher Education, acquired modern and innovative teaching methodologies. The participants of the project

gathered a wealth of pedagogical insights through study visits, online sessions, and training schools organised in Warsaw with the educators from the University of Groningen. Knowledge obtained during the project formed the foundation of the course delivered at the doctoral school the University of Silesia to disseminate best practices to doctoral students – novice teachers. The paper uses the instructional paradigm, the seamless integration of innovative teaching methods, i.e., team-based learning (TBL), assessment and feedback, and gamification. The term "seamless" is used to describe how each element of the course builds on and influences the others in a continuous loop, rather than functioning as an isolated part. For example, TBL serves as the foundation, where students collaborate in small groups to solve problems. The assessment and feedback are immediately embedded within this process, allowing students to receive timely, formative feedback that enhances their understanding and performance. This feedback not only informs their subsequent team-based activities, but also shapes the way they engage in gamification elements, which, in turn, provides an additional motivational layer that influences both individual and group learning behaviours. The gamified components further foster engagement, which cycles back into the dynamics of TBL and the ongoing assessment and feedback loops.

This continuous, dynamic interaction between these elements creates a cohesive learning experience where each component reinforces and is reinforced by the others, resulting in a truly integrated pedagogical approach. The seamless integration of TBL, assessment and feedback, and gamification within the course can lead to significantly higher student engagement, improved collaborative problem-solving skills, and enhanced academic performance, compared to traditional instructional methods where these elements are not interrelated. Specifically, we hypothesize that the continuous interplay between these elements can create a more immersive and motivating learning environment, which in turn positively impacts both individual and group outcomes. It was confirmed with feedback and the evalu-

ation undertaken at the end of semester after the implementation of the course.

2. Literature review

Teaching and assessment methods in higher education (HE) are constantly evolving to adapt to the changing needs and preferences of students. Modern methods in HE are revolutionizing the way students learn and engage with course material. Traditional lectures and passive learning are giving way to more interactive and dynamic approaches that aim to foster deeper understanding and practical application of knowledge.

Group work, which promotes collaboration, critical thinking, and communication skills, is another modern method in which, students work together in small teams to achieve shared learning goals. Through collaboration, they exchange ideas, perspectives, and knowledge, thereby enhancing their understanding of the subject matter. Group learning also fosters communication and interpersonal skills, as students learn to articulate their thoughts, listen to others, and negotiate solutions collectively.

Project-based learning takes this a step further by immersing students in real-world, hands-on projects that require them to apply their knowledge and skills to solve authentic problems or challenges Project-based learning (Wobbe et al. 2023) is highlighted as effective methods for promoting deeper understanding, collaboration, and critical thinking among students.

Team-Based Learning (TBL) (Le 2023, Sweet et al. 2023), is a structured teaching method that encourages active learning and teamwork. TBL consists of six stages:

1) Preparation: Students are provided with material outside of class to familiarize themselves with new topics or concepts.
2) Individual Readiness Assurance Test (IRAT): During class, students take an individual test to assess their understanding of the material.

3) Group Readiness Assurance Test (GRAT): Students then work in groups to solve the same test collaboratively, promoting discussion and peer learning.
4) Instructor Clarification: The teacher provides a brief lecture to clarify any misunderstandings or gaps in knowledge identified during the tests.
5) Team Application: Teams engage in exercises or activities that require them to apply their knowledge in practical contexts, fostering problem-solving and critical thinking skills.
6) Recapitulation: The teacher summarizes the key concepts covered in the session and highlights the learning outcomes, facilitating reflection and consolidation of knowledge.

By implementing TBL, students experience a structured and engaging learning environment that promotes active participation shifting the role of the student to that of an active knowledge seeker. In TBL, students take on a more active role in their learning process, becoming responsible for acquiring knowledge through pre-class preparation, individual and group assessments, and active participation in team activities. This shift in responsibility empowers students to take ownership of their learning journey and fosters a sense of accountability and engagement. Collaboration and cooperation are integral components of TBL. This collaborative environment mirrors the teamwork and cooperation often required in professional settings, preparing students for future endeavours. Furthermore, it was noted that TBL can be successfully implemented in various educational settings, including practical classes such as laboratories or exercises, as well as traditional lecture formats. This versatility makes TBL a valuable tool for educators across disciplines and allows for seamless integration into existing curricula.

Assessment is regarded as an essential aspect of teaching and learning process and its primary objectives include facilitating students' learning, establishing students' knowledge and

skills, monitoring progress, identifying students' strengths and weaknesses, ensuring whether learning objectives have been met, among other purposes. Scholars argue in favour of students' active participation and engagement not only in learning activities but also in assessment. Assessment is considered to have a significant impact on learning and in given courses it may even have a greater impact than teaching (Gibbs 2006).

The following types of assessment can be distinguished: *assessment of learning (*summative assessment), *assessment for learning* and *assessment as learning* (formative assessment). Each of them is considered indispensable in the teaching and learning process in HE. Modern assessment methods aim to ensure that students are able to engage and respond to the assigned tasks, their progress is being continuously monitored during a semester and the teacher assists them in identifying areas for improvement, which can then be acted upon by students.

Formative assessment enables students to plan and monitor their process of learning, granting them autonomy and responsibility for their own learning – the skills continuously in demand on the job market. Assessment for learning allows teachers to monitor students' progress throughout the semester and assist them in identifying areas for improvement, while assessment as learning enables students to become responsible for their own learning, reflect on it and investigate methods to enhance their learning at the same time encouraging peer-assessment, self-assessment, and reflection (NSW Education Standards Authority 2024). These two forms of assessment support learning, allow students to be actively involved and focus on the process rather than outcome; they are not undertaken after the process of learning has been completed and do not act merely as an instrument of measuring attainment. Students' engagement in assessment can lead to a more fulfilling experience of higher education and a culture of testing replaced by culture of assessment, which aims to enhance learning (Gibbs 2006).

A fundamental aspect of the teaching and learning process and an integral element of formative assessment is feedback,

which can be teacher- and student-generated (peer feedback and self-evaluation). Feedback is regarded as "the most powerful single moderator that enhances achievement" (Hattie 1999) when provided appropriately by the teacher, and thus certain conditions need to be observed for feedback to be effective. Some of the most fundamental ones include:

- timeliness of feedback and opportunity for students to make use of it focused, specific, clear, constructive and action-oriented feedback
- unbiased and objective feedback, focused on the task not on the student
- focusing on students' strengths and weaknesses as well as suggestions how to improve considers feeding up, feeding back and feeding forward
- positive relationship between a teacher and a student
- feedback linked to learning outcomes and assessment criteria teaching students how to provide feedback to others
- complementing peer feedback with self-evaluation (reflection) (Hattie 2012, Hattie and Timplerley 2007, Shute 2008)

The importance of teacher-generated feedback is indisputable; nevertheless, it is argued in this paper that it should be supplemented with student-generated feedback. Peer feedback establishes a learner-centred and collaborative learning environment, and knowledge becomes constructed through social sharing and interaction. Self-evaluation (reflective practice) promotes self-awareness, responsibility for own learning, problem solving and critical thinking skills as well as assists decision-making – skills in demand on the job market. Both types allow students to be actively involved in the process of learning, which, in turn, leads

to increasing their responsibility and autonomy and enables them to concentrate on their own learning. It is thus suggested to incorporate multidimensional evaluation and feedback (both teacher – and student – conducted) in HE classroom. Such an approach enables students to receive feedback from different perspectives, can minimize the potential subjectivity of student-generated feedback and enhance students' learning experience. Gamification, a term that emerged in the early 2000s, refers to the incorporation of game design elements into non-game contexts to motivate and engage users. This concept initially found its footing in marketing, where companies utilized game-like structures to foster customer loyalty through programs that mimicked aspects of gameplay. Over time, gamification spread to various fields, including education, healthcare, and corporate training, driven by its potential to enhance motivation and improve outcomes (Kozłowska 2016).

There are four key components of any game, irrespective of its type or level of technological advancement: a goal, rules, feedback, and voluntary participation (McGonigal 2011). The goal provides players with a sense of purpose. Rules set the boundaries for how players can achieve the goal, often encouraging creativity by offering multiple paths to success. Real-time feedback keeps players informed of their progress, helping them adjust strategies to stay on track toward their objectives. Voluntary participation is essential for maintaining a positive and motivated mindset during challenging tasks.

Key benefits of gamification in education include the use of various tasks that encourage interaction, resulting in improved learning outcomes. Gamified activities often involve collaboration, communication, and problem-solving, nurturing essential skills like leadership and time management. When implemented correctly, gamification fosters a sense of healthy competition among students, driving continuous improvement. Students can quickly track their progress and adjust their approach, improving learning efficiency. Game-based learning offers opportunities for tailored learning experiences, allowing students to progress at their own pace and according to their unique needs

and strengths. Gamification allows students to think outside the box and experiment with innovative ideas. Both students and teachers often report higher satisfaction when using gamified methods (Smiderle et al. 2020, Oliveira et al. 2023, Lee 2023).

While gamification can significantly enhance the learning experience, it also comes with certain risks that need to be considered. One major concern is the tendency to place too much emphasis on rewards. When the focus shifts heavily toward external rewards, such as points or badges, students may find themselves driven more by these extrinsic incentives rather than developing a genuine interest in the subject. Additionally, gamification does not impact all students equally. Some students, particularly those who are less comfortable with competition or come from diverse cultural backgrounds, may struggle to adapt to the competitive nature often associated with gamified environments. This can result in higher levels of stress and anxiety, which not only negatively affects their learning experience, but also exacerbates disparities in engagement and achievement across different student groups. The pressure to perform in a competitive, gamified setting can also increase anxiety, especially for students who struggle to keep pace with their peers. Moreover, reliance on gamified learning methods may lead to long-term drawbacks. As students become accustomed to the constant stimulation and reward systems provided by gamified courses, they may encounter difficulties to engage with traditional forms of education. This over-dependence on gamification could hinder their development in professional environments, where tasks are not gamified and require self-motivation and discipline to complete successfully (Nadi-Ravandi et al. 2022).

3. Description of project: Didactics of higher education

3.1. Reason behind the project and research hypothesis

As a result of pedagogical training and personal growth, the authors of the paper decided to train PhD students who embark on their future careers as university teachers, equipping them with modern instructional methods, effective communication skills, and strategies for engaging students in higher education. If we examine briefly the profile of the novice teachers – former postgraduate students – it can be stated that upon entering the doctoral school, they suddenly find themselves in an opposite role. They are less experienced in teaching than their older supervisors and other academic teachers. Yet, they have few crucial advantages, namely a small age difference between them and the students, similar problems, interests and the culture of transmitting and receiving information, not to mention the skilful application of different internet tools and platforms. Consequently, they are able to build a sense of community and establish contact with students more easily and quickly through similar verbal and non-verbal communication. In addition, due to being of a similar age to the students, they are likely to be more effective in finding up-to-date and cutting-edge news and technologies of interest to young people (related to the field of their study), and thus they may be more effective in arousing students' interest in the subject taught.

Therefore, through the project, by delivering the course to doctoral students how to teach in a modern and more effective way, the authors of the paper aimed not only to support them to become better teachers and reduce their stress, but also use the abovementioned advantages of doctoral students to strengthen their prospective students' relationship with the university, resulting in more responsible and autonomous learning and, at the same time, raising the profile of the university.

It is also important to note that many Polish universities are currently struggling with several challenges. Among those related to didactics, the following should be mentioned: (1) the deficit of students related to the demographic decline, (2) the overstimulation of young people related to the rapid development of digitalisation and social media resulting in a lack of student involvement in the more tedious and demanding process of university learning, (3) the inability of future students to determine the choice of their life path, including profession, resulting in young people entering university 'on a trial basis' without a clear interest in the field, (4) the presence of an increasing number of students with various types of disabilities, including the autism spectrum disorder, and (5) an increasing number of foreign students with different educational and cultural background.

For the purposes of the project, therefore, a course for doctoral students has been created. The course not only offered students instruction in modern and effective teaching methods (that could be implemented directly in their work as novice academic teachers), but also aimed to develop their awareness that these methods complement and interact with each other. Therefore, none of the methods of group and individual work can exist without appropriate evaluation and feedback delivered in a manner that encourages learners to further develop their knowledge and skills, as demonstrated in the next sections of the paper. The manner, versatility and frequency of assessment and feedback can, in turn, impact the effectiveness of chosen teaching methods as well as how and when they support students' individual preferences, abilities and development and interdisciplinary learning outcomes.

3.3. Participants

The participants of the course Didactics of Higher Education (n=85) were the 1st year students (f=62 %, m=38 %). They were of Polish (84 %) or other (16 %) nationality and were students at the Doctoral School of the University of Silesia in Katowice. The

doctoral students represented various faculties, including humanities, natural sciences, science and technology, social sciences, law and administration, arts and educational sciences, theology and film studies. The vast majority of doctoral students were in the age group of up to 30 years and had never conducted any classes independently.

3.4. Realisation of the project

The course Didactics of Higher Education was implemented in the winter semester of the academic year 2023/2024 and consisted of three blocks devoted to different aspects of modern didactics. Within each block a separate topic was implemented, which is considered relevant in conducting modern didactics, as noted in section 2. The following sections describe the subject matter of each block.

3.4.1. Constructive alignment, team-based learning and project-based learning

One of the subject blocks in the course focused on the concept of constructive alignment (Hristov et al. 2023) within the framework of class design. This block aimed to provide students with a comprehensive understanding of how to effectively align the various components of a class to achieve desired learning outcomes. Central to this block was the introduction of the didactic pentagon, a conceptual model consisting of five key elements: intention, assessment, content, teaching methods, and media. Each of these elements plays a crucial role in the design and delivery of a class, and it was emphasized that they must all be aligned to ensure coherence and effectiveness (Evaristo et al. 2020).

The intention refers to the overarching goals and objectives of the class—what students should know, understand, or be able to do by the end of the session. Assessment involves determining how student learning will be evaluated and measured, ensuring that assessments align with the intended learning

outcomes. Content encompasses the material that will be covered in the class, including concepts, theories, and examples relevant to the topic. Teaching methods refer to the strategies and techniques employed to facilitate student learning, such as lectures, discussions, group activities, or hands-on exercises (Fränkel et al 2023). Finally, media refers to the tools and resources used to support teaching and learning, which may include slideshows, videos, interactive simulations, or online platforms.

During classes, doctoral students experienced an immersive and practical application of TBL. The session began with a twist on the traditional pre-class preparation: instead of a typical advance assignment, students listened to a presentation of the teacher that delved into the TBL method itself. This initial engagement set the stage for the individual test that followed, which focused on their understanding of TBL concepts.

During the individual test, students indicated their confidence level in each response by assigning a percentage of certainty to possible answers. This approach allowed students to express their uncertainties. Next, a collaborative phase took place, where students were grouped in as much as diverse way as possible. The group formation process was thoughtful and intricate, with each student listing four key aspects about themselves: knowledge, values, hobbies, and skills. These lists served as the basis for creating varied groups, designed to bring together individuals with differing perspectives and strengths. Naturally, the students' answers were known only to the teacher, and the teacher designated the groups. In their groups, students revisited the same test, now engaging in dynamic discussions, debates, and collective reasoning. They had the opportunity to alter their answers, remove uncertainties, or reaffirm their original choices. This phase was marked by lively interactions and deep engagement, as students actively worked to persuade one another and articulate their reasoning. Subsequently, a quiz was conducted in which each group simultaneously revealed their answers by raising a number of fingers corresponding to their choice. Groups with correct answers were

asked to explain their reasoning, and the teacher provided additional insights if needed. This method not only validated the correct answers, but also encouraged a deeper understanding through peer explanations.

After completing both the individual and group tests, students counted their scores. It was observed that group scores were generally higher, highlighting the effectiveness of collaborative learning. However, interesting exceptions were noted where individuals initially had the correct answer but changed it due to group influence, raising intriguing questions about the dynamics of group decision-making and the reliability of majority opinions. Due to time constraints, the final part of the class focused briefly on the practical applications of TBL in each student's discipline. Students were invited to think about and propose ways to integrate the TBL method into their respective fields. This segment proved to be inspiring as students from diverse disciplines such as linguistics, psychology, theology, computer science, biology and many others shared innovative and varied ideas for applying TBL. Feedback from the students after this class was positive. They appreciated the practical exercise and found the TBL method engaging and beneficial. This class not only enhanced their understanding of TBL, but also provided a platform for creative thinking and cross-disciplinary exchange.

3.4.2. Assessment and feedback

The second subject block was devoted to assessment and feedback. The purpose of the block was to draw the doctoral students' attention to diverse types of assessment, the importance of assessment and effective feedback in the process of academic teaching and learning as well as practice providing effective and constructive peer feedback.

Particular attention was drawn to *assessment for learning* and *assessment as learning* (formative assessment), as opposed to the application of merely traditional summative assessment (*assessment of learning*) in the classroom. The need for a greater

amount of formative assessment in HE (apart from summative assessment) was also voiced by doctoral students themselves during group discussions, drawing on their past experiences as postgraduate students. What was suggested during classes, was an attempt to balance formative and summative assessments to guarantee a more thorough evaluation process and a more comprehensive and holistic perspective on assessment[1]. Particular focus during group discussions was also placed on guidelines, recommendations and potential mistakes in formative and summative assessment. Students highlighted the need for feedback to focus on *both* strengths and weaknesses as well as guidelines and recommendations on *how* and *why* to improve their work. Feedback was also perceived as an element of communication between the teacher and students and an aspect which can impact students' motivation and facilitate further self-development.

When reflecting on their past experiences as postgraduate students, the majority of doctoral students revealed an alarming tendency among some academic teachers to consider grades as somehow equivalent to feedback. In other words, the tendency to provide merely grades for students' assignments and very little feedback or none at all. At times feedback provided by academic teachers also appeared to be quite negative and critical[2]. Doctoral students emphasised the consequences of such approach, i.e., studying merely to obtain a grade. Such responses emphasize the need to incorporate a block on feedback and assessment for doctoral students – prospective academic teachers. With regard to types of feedback, during classes with doctoral students it was suggested to complement teacher-generated feedback with student-generated one, i.e., peer feedback and self-evaluation.

[1] It is argued by some scholars, however, that the implementation of both summative and formative assessment may reduce the effectiveness of both forms of assessment.

[2] It is important to remember that feedback is distinct from both praise and criticism, and its intention is not grading.

A practical part of the block was therefore devoted to *providing* constructive peer feedback. At the beginning of the classes, before the discussions and group work on assessment and feedback, doctoral students were allocated time and given opportunity to provide peer feedback to colleagues and reflect on their early drafts of the microteaching task, which constituted the course assignment (see section 4). Peer feedback proved to be a positive experience for doctoral students who valued comments and ideas provided by their colleagues. Owing to peer feedback they were able to consider ways how to improve final versions of their assignments. Reflection, on the other hand, was an opportunity for students to evaluate and analyse their own performance, consider alternative steps which could have been taken as well as to design an action plan to improve a final version of their assignment.

As has been illustrated in this block, incorporating various types of assessment (formative assessment in particular) and feedback (both teacher- and student-generated), as well as authentic assignment tasks affords an opportunity for teachers to create HE learning environments which are more engaging and optimal. Finally, and most importantly, the application of formative assessment and sufficient amount of feedback in university courses, allows assessment to become "an activity done with students" (Brew 1999: 169), not merely to students.

3.4.3. Gamification in higher education

The third element of the course was a block dedicated to gamification. It is placed as last block since the idea was to allow information and skills previously acquired during the first two blocks to be gathered and used to construct the module of students' choice according to gamification principles.

At the beginning of the class, doctoral students were asked whether, as students, they experienced classes conducted using the gamification method. Most of them, at this point, confirmed this fact. However, when then asked what they understood by the concept of gamification, it appeared that, in their opinion, it

was merely quizzes and crosswords included into their practical classes or lectures. Gamification, on the other hand, is the application of game mechanics, aesthetics and way of thinking in real-life situations other than those related to playing for pleasure. Its general task is to attractively encourage achievement of set goals, including overcoming scientific problems, resulting from increased intrinsic and extrinsic motivation.

Another important point of the thematic block on gamification was an attempt by the doctoral students to identify the rules and mechanics of games, based on their own experiences. Interestingly, all doctoral students, regardless of their country of origin and gender, admitted that they indeed enjoyed board games with family or friends, but when the discussion turned to computer games, it turned out to be very embarrassing for most, especially women. Despite the long-standing presence of computer games on the market, in most households the fact of playing computer games is still a taboo subject and is treated as unworthy of university rank. It was significant that even doctoral students of computer science, most familiar with the gaming industry, had not previously considered the mechanisms that motivate them or future game consumers to engage in gaming. In the next part of the class, the doctoral students therefore focused on board games, which, in principle, promote face-to-face cooperation that strengthens social bonds.

Among the key elements, the hallmarks of a good, motivating game were the purpose of the game, the rules of the game, and the ability to track progress. It turned out that the doctoral students did not consider the basic, essential factor, i.e., the voluntary nature of joining the game. Another new element that came out of the discussion was checking the prior knowledge of those joining the game (module) so that everyone can have an equal opportunity to play it. At this point family games for children of different age groups were compared. Only then did it become clear how important it is for students entering the game to have the prospect of successfully completing it.

Since doctoral students worked in groups composed of representatives of different disciplines, their project task was to

develop a new, interdisciplinary gamified module consisting of 5 to 10 meetings throughout the semester. In addition, they could also weave in a storyline either related to the real-life problem the students would face in the module, or a fictional plot based on creative invention or taken from literature or a movie or TV series.

When creating the module, doctoral students used constructive alignment, i.e., they designed what they wanted students to be able to do after completing the course (learning outcomes), took care of assessment, i.e., methods and criteria for checking the achieved goals, and were tasked with developing teaching and learning activities. Most importantly, these activities were to be diverse and to shape a variety of competencies that future employers might expect from students, i.e., hard and soft competencies. Among the tasks proposed by the doctoral students there were mandatory and voluntary tasks, individual and team tasks, including those based on TBL, tasks that were evaluated by the teacher as well as tasks that should be evaluated by the students themselves, allowing practising constructive and positive feedback (e.g., provided through rubrics). Some tasks required creativity, others consisted of merely performing activities following instructions, and some tasks were puzzles. Interestingly, all of the modules proposed by the doctoral students included at least one element requiring learners to physically leave the university building, whether to meet interesting personalities important to the field, to experience in practice the processes the students are learning about, or to learn from the examples that surround us. It was interesting that doctoral students offered this despite the fact that they never experienced such classes themselves when they were students. Doctoral students were also to assign their students tasks that could be completed in different ways to meet the principles of inclusive teaching. Students also unanimously proposed a point-based assessment system without giving negative points for wrong answers or poorly executed tasks. The justification came from their personal experience – negative assessment discouraged them as students from joining and engaging in the modules.

As a summary of the class, each group of doctoral students presented a project of the module, which was then discussed by the whole group. It was an extremely positive observation that, when designing a gamified course, novice teachers always incorporated practical, real-life activities and activities that were currently absent in the subjects they teach.

In the end, doctoral students discussed the examples of gamified modules provided by the teacher as case studies that ended with success and/or failure. In this way, they show the necessity of reflection leading to their evolution and improvement.

Below the challenges during the development of the gamified module are presented, as emphasised by doctoral students:

- developing the rules of the game (clear and transparent assessment criteria and description of the tasks) so they do not raise doubts,
- teaching different competencies at the same time. Lack of awareness that during courses, students should not only gain knowledge or skills specific to a particular field but also develop other competencies, e.g., social competencies,
- lack of awareness by some of the students that one of the tasks of university teachers is to prepare students for the changing requirements of the labour market to increase their employability,
- doubts on the part of some students whether they would be able to convince other colleagues (especially older ones) to use gamification
- fears that introducing gamification would impact educational standards and quality. They perceive the following correlation – serious learning requires a serious (not gaming) environment.
- fear that a significant amount of work will have to be put into preparing and conducting the module and it may not bring the expected results.

In terms of their positive observations doctoral students noted that:

- the gamification method allows students to become responsible for their education,
- modification by gamification of the course naturally forces a rethinking of the purpose of the module, requirements, tasks and their evaluation,
- gamification work systematises, structures and engages students throughout the course, not only at the end of the semester. Consequently, it can help to eliminate massive procrastination or excessive use of AI tools to produce one final written essay for unprepared students,
- gamification allows diversification of classes, discovering or revealing talents, and demonstrating to students that the same goal can be achieved using different means, which enables inclusive teaching,
- in order to improve the gamification of the classes, after they are finished, it is necessary to consider the strengths and weaknesses – thus introducing an element of reflection about their teaching,
- before proposing gamification to students, it is recommended to tell colleagues about it and discuss it (e.g., to see if the rules are clear and not discouraging),
- teaching is an art dependent on generation – teachers, need to constantly educate themselves to be able to catch up with their students.

4. Course credit and rubrics

At the end of the course, students received credit for their participation in a task designed to enhance their teaching skills and peer learning experience. Student- and teacher-conducted feedback was provided. The task involved microteaching - preparing and conducting a 10-minute lesson in pairs on a topic of their choice. Microteaching was selected as an assignment task since it facilitates the development of authentic teaching experiences instantaneously with the possibility of focusing on a specific teaching skill, problem or concept to be practised and improved. The application of microteaching technique can be beneficial,

especially for novice teachers, for building and improving their teaching skills. It can also contribute to enhancing self-confidence and developing classroom management and time management skills. Feedback (from peers and mentors) can be obtained immediately after each session, so that reflection on feedback and the microteaching experience can be performed by the teacher.

In preparation for their microteaching task, students collaborated with a partner to select a topic that aligned with the course objectives and their interests. Then, they worked together to plan and structure their lesson, considering factors such as learning objectives, instructional methods, and materials needed. This work was conducted mostly outside class time. At the end of the course during the last class, every pair of students delivered their presentation to the rest of the class. The aim was to engage their peers with the topic of the lesson, using effective teaching techniques to convey information clearly and promoting engagement. This hands-on experience allowed students to apply the pedagogical principles learned throughout the course in a practical setting. Following each presentation, peer feedback was provided to every presenting pair, offering constructive criticism and suggestions for improvement. Peer feedback focused on various aspects of the lesson, including clarity of explanation, engagement of the audience, application of teaching aids, organisation of content, and classroom management. Rubrics according to which the presentations were evaluated can be found in the appendix. Rubrics served to structure the evaluation of each element of the lessons delivered by the students. Additionally, students had the opportunity to reflect on their own performance and receive feedback from their partner. This reflective process encourages self-assessment and fosters a culture of continuous improvement in teaching practice. By engaging in this collaborative task, students not only gained valuable experience in lesson planning and delivery, but also developed their ability to provide and receive constructive feedback – a critical skill for effective teaching and professional

development. Teacher-generated feedback was provided at the end of class to each pair as well.

5. Impact of the project (achieved goals)

The course proved to be a beneficial experience both for doctoral students and teachers, as indicated in teachers' individual reflections and discussions after the completion of the course, informal student in-class discussions after each block and university surveys completed by the students at the end of semester.

Teachers greatly valued collaborative nature with regard to the course design and delivery (team teaching). The strength of the teaching team was its diversity and interdisciplinarity – diversity in terms of fields of study (natural sciences, technical sciences, linguistics) as well as an interest in different aspects of HE didactics. This also allowed for more extensive brainstorming and mutual learning experience when designing the course.

The interdisciplinarity was also evident among doctoral students. Since during this project there were doctoral students from various faculties at the University of Silesia in each group, they were encouraged to share their knowledge in a way that was understandable to students outside their field of study. It did not prove to be an easy task though. Simultaneously, the doctoral students' awareness of the needs of others was fostered and their readiness to adapt to the prospective students' needs was demonstrated. The course also provided an opportunity for students to experience teaching styles from other disciplines, which they could adopt in their own practice. The multidisciplinary activities proposed during the course have been designed to help doctoral students be prepared for different teaching styles and approach the process of teaching and learning more openly. As regards student participation in the course, students' active participation and their preparation of the microteaching task deserve particular recognition. Presentations prepared by the doctoral students were of high quality. Students attempted

to incorporate many elements of active learning (AL) to maintain student engagement. The most thrilling aspect, however, seemed to be spontaneous discussions after receiving feedback forms from their peers. Instead of merely completing the rubrics and handing them over to their colleagues, the doctoral students spontaneously formed discussion groups and shared their impressions of the microteaching tasks. The discussions were quite intense and engaging.

Doctoral students had the opportunity to evaluate the course via the university survey (online questionnaire) at the end of semester. The course was evaluated on a scale from 1 to 5 (Likert scale). Comments' section at the end of the questionnaire also allowed for open-ended responses. The evaluation included aspects such as a clear and understandable manner of conducting a class, encouraging the expansion of knowledge by the teacher, defining the criteria for the course and determining the final grade of the module by the teacher, and allowing students to freely express different views on the issues discussed in class, to name but a few. The course was evaluated positively by the doctoral students. The average grade of the course was very high (above 4.8/5). In addition, some students included the comments that more contact hours in this subject would be beneficial for them. The view was also shared by the teachers during their informal evaluation upon the completion of the course.

6. Conclusions

The role of teachers in modern education extends beyond content delivery. Teachers are regarded as facilitators of knowledge, creating environments that stimulate critical thinking and acquiring analytical skills, encouraging students to question, reflect, and connect different disciplines, engage students in feedback and self-evaluation and provide formative as well as summative assessment. This interdisciplinary approach helps students develop problem-solving skills and become more informed and critical citizens. One of the challenges in the process of teaching and learning is the lack of a consistent didactic app-

roach since each class and student require adapted practices, making didactics inherently flexible.

The aim of the course was the integration of innovative teaching methods, i.e., team-based learning (TBL), assessment, feedback (both student- and teacher-generated) and self-evaluation, and gamification. Active participation in classes as well as feedback provided by doctoral students and teachers demonstrate that innovative and interdisciplinary approach to teaching in higher education (HE), which emphasises active learning, collaboration, critical thinking, mutual respect and the need for lifelong learning, are considered vital by the academic teachers and students alike. Through the cultivation of a profound comprehension of pedagogical strategies, the aim of the course is to equip doctoral students to emerge as leaders in HE, sensitive to varied requirements of students, proficient in improving educational outcomes, and instrumental in the progression of academic standards. Based on student feedback and in the opinion of the authors of the paper, this goal has been at least partially met.

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APPENDIX 1: Rubrics for microteaching task feedback

Category 1: Course Design and Planning			
Clarity of Learning Objectives			
Poor: Learning objectives are unclear or missing	Fair: Learning objectives are somewhat clear but need improvement	Good: learning objectives are clear and aligned with the course content	Excellent: Learning objectives are exceptionally clear, specific, and well-aligned with the content
Justification			
Course materials			
Poor: Course materials are missing or inadequate	Fair: Course materials are somewhat relevant but need improvement	Good: Course materials are relevant and support learning objectives	Excellent: Course materials are highly relevant, varied, and enhance the learning experience
Justification			
Category 2: Instructional Methods and Strategies			
Engagement			
Poor: The instructor fails to engage students effectively	Fair engagement is somewhat lacking and could be improved	Good: The instructor engages students adequately through various methods	Excellent: The instructor consistently engages students through a wide range of interactive strategies
Justification			
Communication			

Poor: Communication is unclear, and instructions are often misunderstood	Fair: Communication is somewhat clear but needs improvement	Good: Communication is clear and effective, and instructions are easily understood	Excellent: Communication is exceptional, fostering a positive learning environment
Justification			
Active learning			
Poor: Active learning is not promoted	Fair: Some attempts at active learning are made but need improvement	Good: Active learning strategies are effectively employed	Excellent: Active learning is a central part of the class, and students are consistently engaged
Justification			
Category 3: Classroom Management			
Time Management			
Poor: Time is not managed effectively, causing delays	Fair: Time management needs improvement but is somewhat effective	Good: Time is managed well, and the class proceeds as planned	Excellent: Time is managed exceptionally, maximizing the use of class time
Justification			
Overall Performance			
Poor: the instructor's performance is unsatisfactory in multiple areas	Fair: The instructor's performance is somewhat effective but needs significant improvement	Good: The instructor's performance is satisfactory and demonstrates competence	Excellent: The instructor's performance is exceptional in all areas, exceeding expectations

Justification
Additional comments

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