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Foreword

JOANNA REDZIMSKA

Contemporary academic didactics faces a multitude of challenges as it adapts to a rapidly evolving educational landscape marked by technological advancements, changing student demographics, and shifting societal expectations. These challenges demand innovative approaches, as traditional methodologies often fall short in addressing the complexities of modern education and to understand them fully, it is essential to consider the influence of digital transformation, the increasing diversity of student populations, and the demand for interdisciplinary and practical skills in academic curricula.

First and foremost, one of the most prominent dilemmas in contemporary didactics is the integration of digital technology in the classroom. While digital tools have the potential to enhance learning experiences, they also require careful implementation to be truly effective. Educators often face the difficult task of balancing traditional teaching methods with the incorporation of new technologies such as online learning platforms, artificial intelligence, and interactive media. The shift to digital learning, especially accelerated by the COVID-19 pandemic, has raised questions about the effectiveness of online education compared to in-person instruction. Consequently, educators must adapt to hybrid or fully online formats while ensuring that learning outcomes are not compromised. This task is complicated by varying levels of digital literacy among both students and teachers, resulting in a disparity in engagement and comprehension.

Furthermore, the demand for interdisciplinary and practical skills is reshaping academic curricula, placing additional pressure on didactic strategies. As industries increasingly prioritize skills such as critical thinking, collaboration, and adaptability, academic institutions must equip students with competencies beyond theoretical knowledge. However, teaching such skills within the confines of a traditional academic structure is challenging. Didactic models have traditionally emphasized knowledge acquisition and mastery of specific subjects; however, today's students require training in soft skills that are often best developed through experiential learning. Project-based learning, case studies, and internships are examples of approaches that help bridge the gap between theory and practice. Nevertheless, incorporating these methods requires a substantial shift from traditional lecture-based instruction, presenting logistical and organizational challenges for institutions and faculty.

Additionally, contemporary didactics must address the challenge of student motivation and engagement, which have become increasingly difficult in the digital age. The prevalence of social media, online entertainment, and other digital distractions can hinder students' ability to focus and engage deeply with academic content. To counteract this, educators must develop strategies that captivate and sustain students' attention. Interactive and student-centred approaches, such as problem-based learning or flipped classrooms, have shown promise in enhancing engagement. However, these methods require educators to invest more time and effort in lesson planning and implementation, which may not always be feasible given resource constraints.

The selection of articles presented in the following part proves how important a new perspective and modern teaching methods for the current higher education are. Except for the text by Czaja, the rest of articles focus on best teaching practices that were initiated by *Masters of Didactics Training – Advanced Teaching Qualifications* supervised by the Polish Ministry of Higher Education and the University in Groningen. As follows, articles by Jędrzejczak, Nowak and Gryglik concentrate on methods and

improvements that have been applied to offer greater educational opportunities, to motivate and engage students in their own educational process and finally to enhance students' well-being. Furthermore, Redzimska and Sulikowski by presenting their peer tutoring and peer feedback projects highlight the importance of developing students' hard and soft skills as strategies for building future careers. Yet, Przybyła-Kasperek et al. introduce another approach to the academic didactics, namely pointing to the significance of preparing 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. The last article by Czaja is a proposal for teaching a selected course in English phonetics, especially at an academic level, which aims at revealing practical solutions for a language-oriented prosody.

In conclusion, contemporary academic didactics faces a complex array of challenges, each requiring tailored solutions that balance innovation with traditional educational values. To address these challenges effectively, educational institutions must adopt a flexible and dynamic approach, continually reassessing and refining their didactic strategies. While the road ahead is fraught with difficulties, it also presents an opportunity for educators to rethink and rejuvenate academic didactics, thereby enhancing learning outcomes and preparing students more effectively for the demands of the modern world.

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Gamification as a method supporting the adaptation of first-year students to the university life

MAŁGORZATA JĘDRZEJCZAK

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Abstract

The phenomenon of mass student attrition before graduation is a pressing challenge faced by universities globally, including those in Poland. Between 2012 and 2020, over 1.3 million individuals withdrew from Polish universities, failing to resume their studies within a year of deregistration. Notably, the highest dropout rates – up to 70 % – occur within the first two semesters of study. This trend is driven by a confluence of individual factors, such as a lack of interest in the chosen field of study or personal difficulties, and institutional factors, including curriculum design and the pedagogical competencies of academic staff. A key determinant of student retention is the ability to adapt to the distinct norms and expectations of academic life. The successful transition of first-year students to university life is crucial for their subsequent personal and professional development. However, many first-year students struggle with high academic standards, an extensive curriculum, difficult subjects, and monotonous theoretical lectures. Addressing dropout rates necessitates pedagogical reforms, including the adoption of more active teaching methods that promote student engagement, foster critical thinking, and enhance problem-

solving skills. Such reforms empower students to take greater responsibility for their learning, thereby improving their academic experience and retention.

The objective of the project conducted under the *Masters of Didactics – Advanced Program* was to develop a method aimed at increasing student engagement and improving academic performance among first-year students in an engineering program at Lodz University of Technology. The introduction of gamification elements in one of the courses led to a marked improvement in student attendance and heightened willingness to undertake additional challenges. Although the impact of these modifications on students' final academic achievements yielded mixed results, gamification demonstrates significant potential as an effective strategy, particularly for first-year students, to enhance engagement and support their adaptation to the academic environment.

Keywords

university dropout, first-year students, adaptation to study, gamification

Grywalizacja jako metoda wspierająca adaptację studentów pierwszego roku do rzeczywistości akademickiej

Abstrakt

Uczelnie, zarówno w Polsce jak i na całym świecie, mierzą się obecnie ze zjawiskiem masowego ubytku studentów przed uzyskaniem dyplomu. W latach 2012-2020 ponad 1,3 mln osób zrezygnowało ze studiowanego kierunku na polskich uczelniach i w ciągu roku od skreślenia z listy studentów nie podjęło ponownie nauki na nim. Najwięcej przypadków dropoutu przypada na dwa pierwsze semestry studiów (do 70 %). Jest to wynik zarówno różnorodnych czynników indywidualnych (brak zainteresowania kierunkiem studiów, problemy osobiste studenta) jak i szeregu czynników instytucjonalnych, w tym programów studiów oraz kompetencji, także dydaktycznych, nauczycieli

akademickich. Ważnym czynnikiem wpływającym na decyzję o pozostaniu na studiach jest umiejętność adaptacji do odmiennych zasad akademickiego życia. Pomyślna adaptacja studenta pierwszego roku do życia i działalności akademickiej na uczelni jest kluczem do jego dalszego rozwoju osobistego i zawodowego. Szczególnie trudne dla studentów pierwszego roku są wysoki poziom studiów, szeroki zakres materiału, trudne przedmioty, ale także nużące teoretyczne zajęcia i tradycyjnie prowadzone wykłady. Ograniczenie zjawiska dropoutu to między innymi zmiana metod nauczania na bardziej aktywne i pozwalające studentowi przejęcie odpowiedzialności za własna edukację. Nowoczesne metody nauczania angażują studentów bezpośrednio w proces uczenia się poprzez różnego rodzaju aktywności i dyskusje, zachęcając do krytycznego myślenia i doskonaląc umiejętności rozwiązywania problemów.

Celem projektu realizowanego w ramach szkolenia Mistrzowie Dydaktyki – Advanced Program było wypracowanie metody zwiększenia zaangażowania oraz poprawy osiągnięć studentów pierwszego roku jednego z kierunków inżynierskich na Politechnice Łódzkiej. Wprowadzone w ramach jednego z przedmiotów elementy grywalizacji znacząco poprawiły frekwencję studentów na zajęciach oraz ich gotowość do podejmowania dodatkowych wyzwań. Pomimo niejednoznacznych wyników dotyczących końcowych osiągnięć studentów w zmodyfikowanym przedmiocie, grywalizacja zdaje się być (szczególne dla studentów pierwszego roku) bardzo obiecującą metodą poprawiającą zaangażowanie i ułatwiającą adaptację do procesu studiowania.

Słowa kluczowe

rezygnacja ze studiów, studenci pierwszego roku, adaptacja do studiów, grywalizacja

1. Introduction

The transition from high school to university represents a critical milestone in the lives of young individuals, often accompanied by a sense of excitement and anticipation. However, this

transition also poses numerous challenges, which can complicate the adaptation process for many first-year students. One of the most immediate and significant difficulties they encounter is adjusting to the academic demands of university life. The coursework at university level typically differs substantially from that of high school, both in terms of complexity and volume. Students may face challenges such as time management, study skills, social and emotional adjustment, financial pressures, and issues related to mental and physical health. These factors can hinder their ability to adapt to the new academic environment. Unfortunately, such difficulties may contribute to a considerable proportion of first-year students leaving university prematurely (Lorenzo-Quiles et al. 2023).

In the terminology of educational success research, the phenomenon of students discontinuing their chosen field of study before obtaining a diploma, regardless of the reasons or circumstances, is referred to as "dropout" (Quinn 2013; Kehm et al. 2019). This term encompasses both students who have entirely withdrawn from higher education and those who have interrupted their current course of study to pursue a different field or transfer to another institution. The work of American sociologist and anthropologist Vincent Tinto (1975) is considered seminal in dropout research, as he was the first to propose a conceptual framework that has since served as the foundation for subsequent analyses.

The dropout phenomenon is a multifaceted issue with significant consequences for both individuals and institutions. For individuals, leaving university before graduation typically results in reduced lifetime earnings compared to graduates, limiting career opportunities and financial stability (OBW 2023). Moreover, the sense of failure and disappointment associated with dropping out can negatively impact self-esteem and mental health, potentially leading to long-term emotional and psychological challenges. For educational institutions, student dropout translates into financial losses, as universities often rely on state subsidies, which are contingent on student enrolment numbers, as a key source of funding. High dropout rates can

adversely affect an institution's budget, undermining its capacity to provide quality education and resources. Additionally, elevated dropout rates can damage an institution's reputation, reducing its appeal to prospective students and faculty.

At the societal level, less educated workforce can hinder a country's economic growth and innovation potential, as higher levels of education are generally linked to increased economic productivity, technological advancement, and social progress (OPI 2022). Furthermore, high dropout rates and extended time to graduation are recognized in numerous European Union policy documents as inefficiencies in public spending, as well as obstacles to the development of human capital (Stiburek 2017). Consequently, addressing these issues is crucial for fostering sustainable economic and social development.

By understanding the diverse challenges students encounter and implementing targeted support strategies, educational institutions can enhance retention rates and promote both the academic and personal success of their students. In response to the limitations of traditional teaching methods, which are proving increasingly ineffective for contemporary students, universities are adopting modern pedagogical approaches. These innovative strategies not only improve learning outcomes but also facilitate students' transition to higher education. By incorporating methods such as active learning, technology-enhanced learning, personalized instruction, problem-based learning, gamification, and hybrid models, universities can create a more engaging, supportive, and effective learning environment (Yakovleva and Yakovlev 2014). Such approaches not only improve academic performance but also foster social connections, develop practical skills, and cultivate a sense of belonging, all of which are crucial for a successful adaptation to university life.

The aim of the project discussed in this article was to integrate gamification elements into the curriculum of one of the courses within the Environmental Engineering in Construction program at Lodz University of Technology. The primary objective of this initiative was to evaluate whether the modification of the

teaching method would enhance student engagement in the learning process and lead to improved academic outcomes.

2. Literature review

Between 2012 and 2020, over 1.3 million students discontinued their chosen fields of study and did not return within a year of withdrawal. These individuals accounted for as much as 40 % of the student population during the analysed period (OPI Report).

In the past, student dropout was regarded as a normal aspect of academic selection, contributing to the perception of higher education as an elite pursuit (Marciniak et al. 2014). Prospective students, particularly first-year students, were expected to adapt to the established academic norms and assessment criteria in order to remain enrolled in higher education. Moreover, completing a university degree was associated with prestige and typically led to enhanced career prospects. For individuals from smaller towns, attending university often required relocating to larger cities and provided opportunities for social advancement. Despite the relatively low number of applicants – around 10 % of high school graduates in the 1980s – universities consistently experienced higher demand than the number of available spots.

Statistical data unequivocally demonstrate that higher education in Poland has undergone significant expansion. Prior to the political transformation of 1989, the country had 112 higher education institutions, serving a total of 378,400 students (Statistical Yearbook, GUS 1992). However, by the 2010/11 academic year, the number of higher education institutions had increased fourfold to 460, while the student population had expanded more than fivefold (Statistical Yearbook, GUS 2011). The peak in student enrolment was reached during the 2005/06 academic year, when over 1.953 million students were registered. This dramatic growth has led to the conclusion that, in the span of thirty years, higher education in Poland "definitively transformed from an elite institution [...] into a mass institution" (Kupisiewicz 1982). This shift from an elite to a mass system

marks a profound change in the accessibility and reach of higher education, reflecting broader societal changes as well as the effects of Poland's political and economic transformation.

Despite the mass nature of higher education in Poland, evidenced by the fact that over 40 % of high school graduates apply to universities and approximately 1.2 million students are enrolled annually, universities frequently face challenges related to insufficient applicant numbers. In certain programs, the ratio of candidates to available spots is less than 0.5 per position. This issue arises in the context of significant changes in the higher education landscape, including shifts in funding models, the proliferation of universities and their branches – particularly within the private sector—and increased competition between institutions. As a result, universities are now required to compete for every prospective student.

Higher education is increasingly being treated as a commercial product, subject to the dynamics of free-market competition. In this environment, universities that offer superior educational programs, more effectively align with labour market trends, and provide robust support to students throughout the educational process are likely to gain greater popularity and attract more qualified candidates. Research conducted among students has identified key attributes that contribute to the perception of high-quality education. These include the teaching competencies of lecturers, the relevance of educational programs to labour market demands, and the substantive preparation of teaching staff (Ratajczak 2016: 182). The above mentioned factors are considered critical by students in evaluating the overall quality and attractiveness of a university.

Research on university dropout consistently indicates that students who leave higher education prematurely do so for a variety of reasons, including academic failure and voluntary withdrawal (Tinto 1993). Scholars agree that dropping out is rarely the result of a spontaneous, short-term decision or a single factor. Instead, it is understood as a process in which various influencing factors accumulate, leading to a "constellation of

problems that makes leaving the higher education institution seem inevitable" (Heublein 2014: 503).

Five major components are commonly identified as contributing to university dropout: student adaptation, personality traits, socio-economic status, the quality of teacher–student relationships, and the overall quality of university education. These core factors are further accompanied by specific sub-causes, such as demotivation, low self-esteem, frustration, pregnancy, and other personal challenges. Understanding these sub-causes is essential for developing effective strategies to address and eventually reduce dropout rates (Fall and Roberts 2011; Lorenzo-Quiles et al. 2023).

The views of Polish experts corroborate the argument that high dropout rates, particularly in the first year of university, are also shaped by systemic issues in the public education system, which inadequately prepares high school graduates for the demands of higher education (Antonowicz et al. 2014). This underscores the importance of addressing not only individual factors but also broader structural deficiencies in order to mitigate the problem of university dropout.

Support for students at risk of dropping out must be multifaceted and comprehensive. This requires not only a thorough analysis of the problem but also an individualized approach tailored to the specific needs of each student. It is widely recognized that many of the challenges faced by students, particularly those in their first year, can only be effectively addressed at the institutional level. In response to rising student attrition rates, universities have sought to implement a variety of projects and programs designed to support students throughout their academic journey. These initiatives encompass a wide range of measures, from guidance in selecting a field of study to financial assistance, adaptation programs, psychological support, tutoring, mentoring, and community-building activities (Fashola and Slavin 2009; Midford 2023).

Moreover, many universities have established dedicated teams and projects aimed specifically at reducing student dropout rates, such as the START program at the University of Gro-

ningen. In addition to institutional efforts, there are numerous grassroots initiatives led by academic staff who recognize the need for reform within Polish higher education. An example of such an initiative is the foundation established by participants of the Masters of Didactics training series, which seeks to improve the educational experience and support students at risk of leaving university prematurely. These efforts highlight the importance of both top-down institutional strategies and bottom-up initiatives in addressing student attrition.

The vast majority of student dropouts occur relatively early in the academic journey. According to data from the OPI Report (2012–2020), two-thirds of withdrawals from first-cycle studies, 60 % from second-cycle studies, and half from long-cycle master's programs take place within the first two semesters. The first year of university appears to be the most critical period for student adaptation, as it presents a multitude of potential challenges that can hinder successful integration into the academic environment (Clinciu 2013; Birzina et al. 2019). Studies conducted during the first semester reveal that many students struggle to adjust to the demands of university life and the process of studying itself (Ketrish et al. 2017; Cameron and Rideout 2022).

The primary factors affecting student adaptation during this period can be categorized into institutional and personal domains. Institutional factors include the quality of the educational environment and support services, while personal factors encompass students' prior educational experiences and their ability to learn independently. Inadequate adaptation can result in a range of negative psychological outcomes, such as anxiety, depression, increased stress vulnerability, anger, low mood, and mental health disorders (Lorenzo-Quiles 2023).

However, positive psychological adjustment, satisfaction with one’s studies, the development of effective coping strategies, a stronger sense of self-efficacy, and higher self-esteem can mitigate these negative effects. Additionally, the first year is a period in which students develop crucial competencies, including independent functioning, effective time and financial manage-

ment, and intrinsic motivation for learning (Reason et al. 2006; Mattanah et al. 2004). These competencies are essential for students' long-term success and resilience in the face of academic challenges.

In today's rapidly evolving educational landscape, the role of the academic teacher has undergone a significant transformation. No longer limited to the traditional functions of lecturing and grading, academic teachers are now expected to fulfil a multifaceted role that includes mentorship, innovation, and the creation of dynamic learning environments. Contemporary education places a strong emphasis on developing transferable skills and competencies, such as critical thinking, communication, collaboration, and creativity. Academic teachers are crucial in designing curricula and learning activities that foster these skills. By incorporating pedagogical strategies such as problem-based learning, group projects, and real-world applications, they help students acquire the competencies needed to succeed in an increasingly complex and fast-changing world.

Higher education itself is undergoing substantial transformation, driven by technological advancements, evolving student expectations, and a deeper understanding of effective pedagogical practices. Central to this transformation are modern teaching methods, which play a pivotal role in enhancing the quality of education, increasing student engagement, and preparing students for the demands of the 21st century. One of the principal benefits of these methods is their ability to foster greater student engagement. Traditional lecture-based approaches, which often lead to passive learning, can make it difficult for students to maintain interest and absorb information effectively. In contrast, modern techniques such as active learning, flipped classrooms, and gamification directly involve students in the learning process, making education more interactive and dynamic (Andrews et al. 2011; Abeysekera and Dawson 2015; Kumari et al. 2023).

Among these methods, gamification – the integration of game elements into non-game contexts – has emerged as a powerful educational tool (Deterding et al. 2011). Although it began to be

used more widely in education only in the 21st century, gamification has quickly gained its popularity. By incorporating elements such as points, badges, leaderboards, and game-like challenges into learning activities, educators aim to increase student engagement, motivation, and overall learning outcomes (Zichermann and Cunningham 2011). This innovative approach leverages the intrinsic motivation and competitive spirit associated with games to create a more dynamic and interactive educational experience.

One of the primary advantages of gamification is its ability to significantly enhance student engagement (Kapp 2012; Seaborn and Fels 2015; Oliveira 2022). Traditional educational methods often struggle to maintain students' sustained interest, leading to disengagement and suboptimal performance (Lee and Hammer 2011). Gamification addresses this issue by making learning more enjoyable and stimulating (Arslan Namli 2016). When students receive immediate feedback, earn rewards for their achievements, and see tangible progress, they are more likely to remain motivated and actively engaged in their studies.

In addition to fostering engagement, gamification enhances motivation by providing clear goals and rewards. The use of points, badges, and leaderboards introduces a sense of achievement and progress, which can be particularly motivating for students who may not respond as effectively to traditional grading systems (Barata et al. 2013; Gibson et al. 2013). The competitive aspects of gamification, such as leaderboards, also introduce a social element into learning, encouraging students to strive for excellence not only for personal satisfaction but also for recognition among their peers (Berkling and Thomas 2013). This competitive dynamic can drive students to put forth greater effort and take a more active role in their education.

Moreover, gamification supports the development of essential skills, including critical thinking, problem-solving, and teamwork. Many gamified activities are designed to be collaborative, requiring students to work together to meet challenges. This collaborative aspect not only helps students develop social and communication skills but also fosters a sense of community and

belonging within the classroom. Problem-solving tasks within a gamified framework encourage students to approach problems from different perspectives, thereby enhancing their analytical abilities (Kim and Castelli 2021).

Beyond its ability to boost engagement and motivation, gamification also offers valuable data on student performance and learning progress (Oliveira 2023). Through gamified systems, educators can track student performance, identifying which students are excelling and which may need additional support. This data-driven approach allows for more personalized and targeted interventions, ensuring that each student receives appropriate challenges and assistance.

However, despite its many benefits, gamification is not without challenges (Fuchs 2023). Effective implementation requires careful design to ensure that game elements align with educational goals and do not overshadow learning objectives. There is a risk that students may become more focused on earning rewards than on mastering the material. Additionally, the competitive aspects of gamification may lead to increased stress and anxiety for some students (Toda et al. 2017). Thus, educators must strike a balance, using gamification as a tool to enhance learning rather than as an end in itself.

To implement gamification effectively, thoughtful planning and consideration of students' specific needs and preferences are essential (Smiderle et al. 2020; Dicheva et al. 2015). Teachers should strive to create an inclusive and accessible gamified learning environment that provides multiple pathways to success. It is crucial that rewards and challenges are meaningful and relevant to the learning objectives, ensuring that all students benefit from the gamified approach (Dichev and Dicheva 2017).

3. Project

Lodz University of Technology, similar to other technical universities in the country, experiences a notably high dropout rate

among students, particularly during their first year of study. This phenomenon can be attributed to several factors. In addition to the common challenges related to adjusting to a new style of learning compared to high school, integrating into the academic environment, and managing the transition to independent living and personal responsibility, students also face difficulties arising from the demanding nature of the curriculum. These challenges are exacerbated by educational gaps carried over from high school, which hinder students' ability to cope with the increased academic rigor.

The growing difficulty students experience in adapting to the learning methodologies employed at higher education institutions, coupled with deficiencies in their high school education, is becoming increasingly evident. Furthermore, there has been a noticeable shift in the attitudes of young people, particularly in their interactions with academic staff and their approach to education. It is increasingly challenging for students to make a transition from perceiving learning as an obligation to viewing it as an opportunity for personal growth and self-development.

In this context, it is important to note that contemporary students demand new and innovative teaching methods. Traditional pedagogical approaches are proving less effective than they once were. Young people, having grown accustomed to the pervasive use of technology, are constantly exposed to multiple stimuli from digital devices such as computers and smartphones. Consequently, traditional teaching methods, which often lack the dynamic and multisensory engagement of modern multimedia forms of communication, are frequently perceived as monotonous.

One of the most common leisure activities among young people is playing video games, which offer a level of interactivity that traditional forms of entertainment, such as films or books, cannot match. Many video games require players to develop key skills, including quick reflexes, strategic thinking, and logical reasoning. Young people are drawn to the challenges presented by games, which allow for continuous personal development. Moreover, video games often incorporate reward systems that

recognize and reinforce player achievements, such as unlocking new levels or acquiring in-game items. These rewards provide players with a sense of accomplishment and motivation to persist. As a result, gamification has emerged as an increasingly popular approach in education. By integrating game elements into learning, educators can effectively motivate students and foster greater engagement with the educational process.

The objective of this project was to modify the teaching methodology for the course "Sanitary Biology" in the Environmental Engineering in Construction program by incorporating gamification elements, such as scoring systems, levels, badges, and leaderboards. These elements were introduced into the lecture component of the course, while laboratory exercises, being primarily practical in nature, remained unchanged. The primary aims of this modification were to enhance student engagement in the subject through optional point-based tasks, improve lecture attendance, and increase focus on the content presented. Additionally, participation in the gamified learning process was intended to make the subject matter more accessible and enjoyable for students.

Participation in the gamification initiative was entirely voluntary. At the beginning of the semester, students were invited to declare their involvement in the game; however, this declaration did not impose any obligation to complete specific tasks. Importantly, students were neither penalized for inactivity nor for a lack of progress in the game. Furthermore, every activity undertaken by students within the course was awarded points, which ranged from lecture attendance to various tasks, spontaneous test questions, and quizzes based on lecture content. Additionally, students could earn bonus points, for instance, by committing to the game (incentive points) or through consistent attendance, such as attending multiple consecutive lectures without being late. Thus, by accumulating a certain number of points, students were able to advance to the next level within the game.

Initially, all participants began at the "Trainee" level. Upon reaching the designated point threshold, they advanced through

successive levels, namely “Specialist,” “Expert,” and finally “Master”. Notably, the last two levels were associated with tangible rewards, as students reaching these levels received an additional 10 % or 15 % of points, respectively, on their final lecture exam. Moreover, the student who emerged as the overall winner of the competition was awarded the highest grade for the lecture portion of the course.

In addition to the level system, badges were awarded throughout the game to recognize specific achievements. For example, the “Leader's Shirt” was awarded to the student ranked first, “Genius” was given for perfectly completed tasks, “Sharpshooter” was granted to students who answered at least 90 % of quiz questions correctly, and “Philanthropist” was awarded to those who generously donated points to a classmate.

The gamification spanned 11 weeks of the 13-week lecture period. Each week, beginning in the sixth week of the semester, a ranking was published on the WIKAMP platform (an educational platform at Lodz University of Technology based on Moodle), displaying the current scores and badges earned. In order to ensure anonymity, the ranking listed only encrypted player data. At the start of the game, students selected pseudonyms (nicknames for the game), which were known only to the instructor. At the end of the lecture series, the gamification results were summarized, and prizes were awarded. These included promotional items provided by the University’s Promotion Department, which were presented to the three students with the highest scores, and only their names were disclosed.

This project has been implemented three times to date, during the summer semesters of the 2021/22, 2022/23, and 2023/24 academic years. It involved 21, 24, and 17 first-year students, respectively, from the Environmental Engineering in Construction program. Significantly, each year, all students within the cohort opted to participate in the game. In order to assess the effectiveness of the project, several parameters were evaluated, including lecture attendance, the frequency with which students undertook additional tasks, and final grades from the lecture component of the course. These results were

then compared to the performance of students in the same course during the three preceding academic years (2018/19, 2019/20, and 2020/21), in which 26, 44, and 27 students participated, respectively, and where the classes were conducted in a traditional, non-gamified manner. Thus, the comparison provides insights into the impact of gamification on student engagement and academic performance.

3.1. The impact of the project

The influence of the project on student achievements appears to be somewhat ambiguous. Nevertheless, the implementation of gamification clearly influenced student attendance at lectures (72 % in non-gamified cohorts compared to 90 % in gamified ones) as well as the completion of various optional tasks, which, although limited, also existed prior to the project's implementation. In the years preceding the introduction of gamification, only 3-4 students per year (approximately 10 %) completed all additional tasks. In contrast, with the gamified approach, this rate increased significantly, averaging 57 % across all studied cohorts. These data suggest an increase in student engagement and a greater willingness to undertake additional challenges following the introduction of gamification in the course.

However, despite the fact that 100 % of students initially declared participation in the gamification, there were consistently some students (approximately 15 % per cohort) who either did not engage or engaged only minimally in completing the additional tasks. This suggests that while gamification may encourage higher levels of participation, it does not guarantee universal engagement. Student performance on the final test showed a slight improvement following the introduction of gamification, with an average score of 3.38 compared to 3.22 in the non-gamified cohorts. Similarly, the percentage of students passing the test on the first attempt was marginally higher in gamified groups (68 % versus 59 %). These differences could be attri-

buted, at least in part, to the additional points students earned for reaching certain levels in the game.

However, it is important to note that the small size of the student groups (the limited sample size) may have influenced these results, as individual differences in students' abilities and their initial preparation for the course could also play a role. This assumption is supported by the fact that one of the gamified cohorts achieved a slightly lower final test score than the students who completed the course in the traditional format. Despite these mixed results, the project will continue to be implemented in the course in future years, with planned modifications and improvements aimed at further enhancing student performance on the final test.

4. Conclusions

Gamification in education represents a promising strategy for addressing several persistent challenges associated with traditional educational methods. By making learning more engaging, motivating, and interactive, it has the potential to enhance educational outcomes and foster the development of essential skills for the future. Nevertheless, some studies indicate that the use of gamification in an educational context does not always lead to improved student outcomes (Toda et al. 2018; Koivisto and Hamari 2019). Consequently, the effectiveness of gamification may vary depending on the specific design of the gamified system, particularly the selection of game elements, which can lead to different student experiences and learning outcomes.

Therefore, the success of gamification in education is contingent upon its careful implementation and a focus on preserving the integrity of the educational objectives. When employed effectively, gamification has the potential to transform the learning experience, making it both more enjoyable and more conducive to achieving positive educational outcomes for students.

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A wise man changes his mind, a fool never will: From the idea of gamification to breaking the barriers of passive student behaviours that stem from a fear of making mistakes

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Abstract

This article presents the findings and conclusions from a course gamification initiative conducted as part of the Masters of Didactics teaching program. The primary objective of the course modification was to employ gamification in selected classes to address and counteract students' passive attitudes. The classes involved both Polish and international first-year Master's students in biology and biotechnology. Gamification was applied specifically to laboratory sessions, during which students developed fictitious start-ups aimed at addressing pressing environmental challenges. The initial outcomes revealed that a significant barrier to active participation in the gamified module was the students' fear of making mistakes. Consequently, it was decided to adopt a more supportive approach towards the students throughout the semester. As a result, students were provided with a learning environment where mistakes were viewed as opportunities for growth. Over time, this shift in approach led to increased openness and active

participation among students. Despite several initial challenges, the course modification produced notable results, including 100 % attendance and heightened engagement, particularly among international students. These results underscore the potential of gamification, coupled with supportive teaching methods, in effectively educating both Generation Z and future Alpha students.

Keywords

gamification, motivation, students, fear

Ci, którzy nie zmieniają zdania, nic nie zmieniają: od pomysłu na gamifikację do przełamywania bierności studentów wynikającej z obawy przed popełnianiem błędów

Abstrakt

Niniejszy artykuł przedstawia wyniki i wnioski z próby wprowadzenia gamifikacji kursu zrealizowanej w ramach programu Mistrzowie Dydaktyki. Celem modyfikacji zajęć było zastosowanie grywalizacji wybranych zajęć celem przezwyciężenia pasywnej postawy studentów. W zajęciach wzięli udział polscy oraz międzynarodowi studenci pierwszego roku studiów magisterskich z biologii i biotechnologii. W ramach kursu wdrożono grywalizację zajęć laboratoryjnych, podczas których studenci tworzyli fikcyjne start-upy mające na celu rozwiązanie palących problemów środowiskowych. Początkowym rezultatem projektu było ujawnienie, że strach przed popełnieniem błędów był istotną barierą uniemożliwiającą aktywny udział studentów w „gamifikowanym" przedmiocie. Dlatego też, w trakcie semestru, zdecydowano o zmianie podejścia do studentów na bardziej wspierający, w kierunku tutoringu. Z czasem, gdy zapewniono studentom przestrzeń, w której błędy były traktowane jako okazja do nauki, studenci stawali się bardziej otwarci i aktywni. Pomimo szeregu początkowych wyzwań uzyskano 100 % frekwencję studentów na zajęciach, obserwowano zwiększone zaanga-

żowanie i lepsze oceny, szczególnie wśród studentów zagranicznych. Wyniki podkreślają potencjał grywalizacji i wspierających metod nauczania w edukacji studentów pokolenia Z i przyszłych studentów pokolenia Alfa.

Słowa kluczowe

gamifikacja, motywacja, studenci, strach

1. Introduction

Excessive workload and high expectations, low self-efficacy, lack of intrinsic motivation, disengaging teaching methods, negative peer influence, and limited opportunities for experiential learning are the most frequently cited factors contributing to passive behaviours among students in higher education (Salanova et al. 2010; Freeman et al. 2014). In recent years, the prolonged isolation of students due to the COVID-19 pandemic has further exacerbated this issue. As students became accustomed to being physically and socially detached from the university environment, many lost their connection with peers and the daily routine of university life, which may have also contributed to their passivity (Hehir et al. 2021).

This article presents the results and conclusions of a course modification aimed at addressing and reducing passive behaviour among university students. The project was implemented as part of the Masters of Didactics program, under the Advanced Teaching & Tutoring pathway, led by the University of Groningen in 2023.

2. Literature review

The mindset and lifestyle of today's students have undergone significant transformations. Currently, universities are educating Generation Z students, who are characterized by their distinctive worldview, independence, multitasking abilities,

and heightened self-awareness. This generation is also noted for its active involvement in social causes and community service. However, in the near future, universities will begin to welcome students from Generation Alpha, the most diverse and globally aware cohort to date. This generation is highly proficient in technology and video games, accustomed to rapid changes, and often exhibits shorter attention spans with a preference for instant gratification. Nevertheless, they are also quick and incisive learners, capable of independently seeking out information and solutions (Ziatdinov et al. 2021, O'Farrell and Weaver 2024).

Consequently, as a result of these generational shifts, many traditional educational methods that were once effective have become outdated. In the context of contemporary education, which operates within a rapidly evolving world, addressing the challenges of student motivation and engagement has become increasingly complex. Indeed, this issue is multifaceted, involving both the attendance of students at classes and their active participation once present. Furthermore, there are numerous theories related to motivation (Urhahne and Wijnia 2023), all of which seek to explain and understand how motivation influences educational outcomes.

Moreover, the importance of motivation in education is further underscored by its role in achieving the United Nations' Sustainable Development Goal 4, which emphasizes the provision of inclusive and quality education for all by 2030. In this context, intrinsic motivation (IM), defined as the internal drive to engage in activities for personal satisfaction and self-development, has emerged as a critical factor (Alonso et al. 2023). Based on recent theoretical frameworks and practical interventions (Ferrer et al. 2022; Urhahne and Wijnia 2023; CAST 2018; Ang et al., 2021; Walsh et al. 2021; Wentzel 2022), several strategies have been identified to meet the psychological needs of students, thereby fostering their intrinsic motivation. These strategies include:

1. giving autonomy by offering choices in learning activities and promoting self-initiated learning
2. using real-world applications by linking academic content to students' interests
3. providing mastery-oriented feedback focused on effort and improvement rather than grades
4. creating collaborative learning environments encouraging group projects and peer discussions
5. inverting traditional and passive teaching methods to promote active learning and student engagement
6. incorporating practices encouraging students to reflect on their learning experiences
7. building connections between teachers and students to enhance a sense of belonging.

To begin with, gamification is one teaching method through which we can implement these strategies. However, when asked about the use of gamification in schools, teachers, students, and parents often point to online quizzes during lessons as the primary example. This approach, however, is far removed from the true definition and purpose of gamification.

The term “gamification,” which first emerged in the early 2000s, refers to the application of game elements in non-gaming contexts, such as marketing, to create loyalty programs (Kozłowska 2016). During this period, websites began incorporating game-like elements to diversify user experiences and attract broader, younger audiences. In 2010, the first book on gamification, titled Game-based Marketing, was published, positioning its author as one of the leading experts in the field. Historically, the earliest recorded example of gamification can be found in Herodotus’ Histories, where the Lydians used gamification to distract people suffering from famine during wartime. Importantly, by eating every other day and playing dice on the alternate days, the Lydians not only survived but also developed greater resilience, creativity, and persistence. Subsequently, they laid the foundations for the Etruscan civili-

zation, renowned for its creativity and innovative solutions (McGonigal 2011).

In her book Reality is Broken, Jane McGonigal (2011), a prominent scientist and consultant to major game development companies, identifies four essential traits that define every game, regardless of its type, duration, or technological sophistication: (1) a goal, (2) rules, (3) real-time feedback, and (4) voluntary participation. A clearly defined goal gives players a sense of purpose. The rules outline how to achieve this goal, and the more non-obvious paths available, the greater the potential for creativity among players. Timely feedback allows players to track their progress and confirms that they are on the right path. Voluntary participation is particularly complex, as it involves a shared agreement among participants to accept the same terms and conditions, while also allowing the option to leave the game at any time, making it easier to approach difficult or stressful tasks.

In the educational context, which will be discussed further in this article, I would personally, as both a player of various board and video games and a teacher, add a fifth essential feature of games: (5) the possibility of replay. The opportunity to replay a game, after becoming familiar with its tasks (both successful and failed), allows players to recognize their previous mistakes and develop strategies to correct them, fostering an expectation of success and a drive to achieve it.

In education, gamification refers to the integration of game elements and design techniques into learning activities to enhance students' achievement of desired learning outcomes (Kovácsné 2021). Although gamification has been widely researched, its effectiveness in higher education remains inconclusive (Mula-Falcón et al. 2022; Tanirbergenovna et al. 2021). Much of the existing research has been conducted with students from earlier generations and diverse cultural contexts. Even students from early Generation Z, who entered universities between 2012 and 2018, were influenced by relatives from Generations X and Y, for whom gamification—and by extension, video games—might carry negative associations, such as ad-

diction. This insight is derived from my own experience with doctoral students (young teachers), some of whom categorically rejected gamification as a teaching method, perceiving it as diminishing the academic integrity of the university (Holewik et al. unpublished).

However, the middle cohort of Generation Z is now beginning to enter universities, and future students from Generation Alpha are just beginning secondary school. The implementation of gamification in education should be a balanced approach, one that aligns the core characteristics of games with the psychological needs of students from Generations Z and Alpha. This indicates that well-designed gamification has the potential to enhance students' intrinsic motivation. If we aim to foster greater student engagement in the learning process, we should facilitate this by incorporating gamification into at least some courses.

As far as the issues mentioned above are concerned, numerous approaches (Smiderle et al. 2020; Oliveira et al. 2023; Lee 2023) have highlighted the positive aspects of gamification, particularly in relation to contemporary students. These studies emphasize:

- games inherently promote active engagement, as they consist of a series of varied tasks that encourage participation and interaction, which in turn leads to enhanced learning outcomes;

- gamified learning fosters the simultaneous development of soft skills, as it frequently involves collaboration, communication, and problem-solving, thereby helping students cultivate essential competencies such as teamwork, leadership, and time management;

- gamification encourages healthy competition, which drives continuous improvement and motivates students to strive for excellence;

- the provision of instant feedback enables students to promptly assess their progress and correct mistakes, thereby facilitating more effective learning processes;

- gamified learning allows for a more personalized educational experience, as it can be tailored to individual needs and skill levels, enhancing the learning experience for each student;

- it provides greater opportunities and motivation for creativity, fostering out-of-the-box thinking, experimentation, and innovation in students;

- lastly, gamification increases enjoyment and overall satisfaction with tasks for both students and educators, thereby improving the learning environment.

Moreover, gamification also presents potential risks to the student learning process. According to Nadi-Ravandi et al. (2022) and Lara et al. (2023), these risks include the following:

- an overemphasis on rewards such as points and badges may lead to a heightened focus on extrinsic motivation, resulting in superficial learning rather than deep engagement with the material;
- unequal opportunities can arise, as different students respond variably to gamification, potentially leading to disparities in both learning outcomes and levels of engagement;
- the competitive elements inherent in gamification can induce increased anxiety and stress, particularly among students who may struggle to keep pace with their peers or those from different cultural backgrounds;
- over time, reliance on gamified courses may diminish students' willingness or ability to engage in more traditional learning methods or tasks, which could have negative implications for their future careers.

As follows, implementing effective course gamification also presents challenges for educators (Flores-Aguilar et al. 2023; Guerrero Puerta 2024). A misunderstanding of the core principles of gamification often leads to errors in its application during interactions with students. Developing a successful gamified system requires substantial time and effort, and, depending on the concept, may also necessitate considerable technical resources. Educators who associate gamification primarily with competitive elements tend to cultivate a group of "fans" rather than fostering a community of lifelong learners.

Furthermore, there is a tendency to expect rapid results, which can lead to the premature abandonment of gamified activities if they do not yield immediate benefits. Additionally, overly general learning objectives can result in diluted outcomes, with little noticeable impact on students' behaviour. A rigidly structured gamified system may also constrain students' creative thinking, as they may become focused on adhering to predefined patterns rather than exploring innovative solutions.

In conclusion, while gamification offers numerous advantages in terms of engaging students from Generations Z and Alpha, it is essential to address the associated challenges and risks through thoughtful design and careful implementation. This approach ensures that gamification enhances the learning experience without compromising students' well-being or long-term development.

3. Proposal for gamified course modification

3.1. Personal background and teaching philosophy statement

As a biotechnologist working closely with individuals in experimental fields, I have grown accustomed to the necessity of constant change. In this field, new discoveries frequently challenge and reshape previously established theories. However, I was unprepared for the significant shift in student behaviour when

they returned to university after the COVID-19 lockdown. The teaching methods that had been effective before the pandemic were no longer producing the desired results. Like many members of the younger generations, I quickly become disengaged when things remain static; therefore, rather than waiting passively for spontaneous changes, I actively seek to innovate and experiment with new approaches. Motivated by the principle of continuous improvement, I decided to make a substantial change and apply a "didactic shockwave" to reinvigorate student engagement. The integration of robust gamification mechanisms into my teaching methodology was intended to shake students out of their apathy and subconsciously encourage active participation, much like the video games they are familiar with.

Early in my teaching career, I focused solely on biotechnology students. However, as I began teaching students from other faculties, I realized how uniform the teaching methods were within our faculty. Classes followed a set structure, and while they were experimental in nature and required active participation, students did not voice complaints. Nonetheless, I recognized that the program lacked creativity, variability, and opportunities for students to extend their learning beyond the standard curriculum. This realization prompted me to enroll in the *Masters of Didactics* course, which enabled me to introduce a variety of new activities into my lessons.

It was only through the subsequent *Advanced Masters of Didactics* course, which emphasized reflective teaching practices, that I began to critically examine the role of each pedagogical element in modern education. Participation in this program helped me to appreciate the importance of diversifying teaching methods and applying them in ways that are most beneficial to students. I now teach in a way that I believe best fosters innovation, creativity, and peer learning, all while ensuring that these activities are aligned with a common educational goal. Additionally, I have changed my approach to working with students; rather than thinking for them, I now focus on supporting their independent learning and development.

3.2. The description of the idea

3.2.1. Preliminary problem analysis and goal of the modification

The module selected for modification, offered to master's students, has traditionally been well-received by students, even during the pandemic. During that period, despite conducting all the experiments myself as the instructor and streaming them live, students remained actively engaged in the learning process. They proposed experiments, offered comments, and engaged in open discussions, fostering a collaborative and dynamic atmosphere. However, following the end of the pandemic and the return to in-person learning, the atmosphere in my classes changed drastically. What had once been a space filled with lively discussions and scientific brainstorming became quiet and passive. The enthusiasm that previously sparked active participation and curiosity was replaced by a lack of engagement. Students no longer showed a desire to experiment or progress, instead performing only the bare minimum and failing to learn from previous classes.

Although students continued to attend lectures, they no longer appeared to derive meaningful benefit from them. Rather than engaging with course materials, they increasingly relied on easily accessible, unverified online sources. Furthermore, during laboratory classes, students displayed unethical behaviours, including cheating and attempting to fabricate results. They failed to reflect on errors in their calculations, an oversight that could have serious consequences in future professional work in analytical or environmental laboratories. When interpreting experimental results – often designed to challenge common societal assumptions – they ignored the knowledge and experience gained in class, instead turning to unreliable websites and concluding that their experiments had been conducted incorrectly. Even in group projects, students demonstrated a lack of social responsibility, failing to recognize that their disengagement could compromise the efforts of their peers, potentially leading to project failures that harmed those who were committed to the

work. In essence, my students had become passive and disengaged.

The objective of this initiative was to explore whether, how, and to what extent the introduction of diverse teaching methods – specifically through the gamification of the module in a non-traditional classroom environment—could address and mitigate students' passivity and unethical behaviour during lectures and laboratory classes.

3.3. Participants

The participants in this study were first-year master's students enrolled in the biology and biotechnology programs. For biotechnology students, the course was mandatory, whereas for biology students, it was an elective. The participants were divided into four domestic, Polish-speaking groups and two international project groups. Some of these groups were enrolled in the basic course, while others participated in the advanced course. Both courses shared a common foundational core; however, the advanced course, which involved twice the number of instructional hours, also covered more in-depth and complex topics.

3.4. Data collection and analysis

At the beginning of the semester, it was anticipated that the teaching methods could be adapted in response to student feedback. Data related to the evaluation of the impact of the proposed solutions on student engagement and learning outcomes were collected continuously throughout the semester. One source of the data consisted of the teacher's assessment of the students' progress on various assignments. Additionally, data were gathered during class sessions through face-to-face conversations between the teacher and the participants. These data provided the foundation for written notes, which were later analysed by both participants and supervisors in subsequent *Masters of Didactics* workshops. A third type of data was derived from written feedback submitted by students in the end-of-

semester evaluation questionnaires, in which they assessed the modified course.

3.5. Realisation

The project was initially designed with a primary focus on enhancing student engagement. This objective was achieved through the gamification of laboratory sessions and a shift in the lecture format to a more seminar-like structure. These modifications were intended to foster active student participation and deeper involvement in the learning process.

The lectures, thematically linked to the experimental component of the course, were scheduled in such a way that their content always preceded the corresponding laboratory sessions. While I had previously employed interactive lectures incorporating videos, quizzes, and Team-Based Learning (TBL) sessions, the new strategy aimed at further activating students by giving them "airtime." Specifically, students were invited to take on the role of the lecturer every 20-30 minutes. Although this task was optional, it required the preparation of a pre-selected topic and its presentation in a concise five-minute format. Additionally, students were tasked with formulating one question about the presentation using an online application. This approach was intended not only to engage students but also to introduce a brief pause in the lecture and observe how students from the same digital generation communicated information, both visually and orally, to their peers.

The gamification of the experimental component involved the creation of a storyline centred on current environmental challenges. Students, placed in a real-world scenario, were required to form fictitious start-up companies in groups, with the aim of solving a particular environmental issue both theoretically and practically over the course of the semester. At the semester's end, each student group was expected to present their solution at a final conference. The format and presentation method – whether a demonstration stand, a film, or a research pitch –

were left to the students' discretion, with only time constraints imposed.

The following principles were adopted in the design of the project:

- in line with the principle of voluntary participation, students had the option to either engage with the gamified version of the course or complete it in a traditional format;
- the tasks incorporated a mixture of individual, pair, and group project work, with both in-class and out-of-class components, allowing students to develop both personal and teamwork skills;
- two tasks involved peer assessment. The first required students to evaluate the preliminary theoretical written project proposals of another member of their group, encouraging critical reading and preparation for internal group discussions. Both the drafts and peer assessments were completed using rubrics that had been collaboratively prepared. Additionally, at the end of the semester, students evaluated each other's contributions and engagement in the project;
- while some tasks were outlined at the start of the semester, others were designed as surprises with predetermined dates. These surprise tasks aimed to activate prior knowledge and strengthen group cohesion;
- during selected laboratory sessions, students were encouraged to propose the materials they wished to work with, thereby enhancing their curiosity, sense of ownership, and engagement with the project;
- each task that required intellectual input was rewarded with points. Importantly, all points awarded were positive;

- the tasks were divided into mandatory, optional, and critical tasks, with the latter requiring a minimum passing threshold of 51 %;
- exceptional completion of complex tasks was recognized with badges. Students had the opportunity to propose the criteria for earning a badge, which could be awarded to individuals or groups;
- additional symbolic points, referred to as "second life" points, were awarded to students who attended all classes. In order to complete the game, students had to retain at least one primary "life," which was not tied to rewards;
- students could accumulate more points than were necessary for the highest grade. A significant surplus of points resulted in exemptions from specific exam questions.
- lastly, it was collectively agreed that all deadlines would be adhered to in order to prevent students from postponing tasks. This ensured that students received timely feedback from the instructor.

In summary, this comprehensive approach was designed to enhance student engagement, promote active learning, and address passivity through the structured incorporation of gamification techniques.

During the first organizational class, students were introduced to the grading criteria, course storyline, and gamification process, and were given time to decide whether to participate in the standard or modified version of the course. The module began with enthusiasm, as all students initially expressed willingness to participate. However, since the module was primarily focused on biotechnology, biology students quickly withdrew from the task of preparing lecture topics, as did the English-speaking students. Only a few biotechnology students expressed interest. While the lectures maintained nearly full attendance, the initiative to have students take on the role of lecturers proved less effective. The presentations were prepared

with minimal effort, and their quality, both in terms of content and visual presentation, was subpar. Although other students listened attentively, their responsiveness was limited.

In contrast, international students responded positively to the gamification of the laboratory sessions, demonstrating a strong commitment to completing all tasks. Throughout the semester, they regularly attended consultations, asked questions, and sought to improve their projects to earn higher points. Their work and group collaboration were exemplary, marked by a supportive and positive atmosphere in which they encouraged one another and maintained a high level of motivation. Each session was characterized by openness and excitement.

However, the situation was notably different for the Polish students. While one group displayed positive peer motivation, the initial enthusiasm of the other groups gradually diminished, giving way to mediocrity and apathy. It was as though their internal motivation was steadily draining. This disengagement culminated during the task of preparing individual project proposals and conducting peer reviews. The quality of the proposals was significantly lower than expected, and the peer reviews failed to reflect these shortcomings. Despite the teacher's ongoing encouragement, students remained apathetic, did not attend consultations, and showed little interest in improving their projects. This task was crucial, as the experimental work aimed to address the main problem outlined in the course storyline, and the semester's end could not be delayed. Consequently, in subsequent classes, I inquired about the underlying causes of the students' lack of progress.

It became evident that students believed only the instructor was qualified to evaluate their work, and they felt uncomfortable with the notion of peer assessment, despite agreeing to it at the beginning of the semester. After nearly an hour of discussion, it became clear that the unspoken but prevailing issue was fear. Students, for the most part, were apprehensive about the choices presented to them and preferred to be told what to do. Those who undertook optional assignments did so out of fear of failure rather than a desire to succeed. They avoided consul-

tations because they felt unprepared and had done little to improve their readiness. They hesitated to engage in project preparation, doubting their ability to succeed. Additionally, weaker students feared being perceived as inadequate, while more capable students worried that their peers would expect them to carry the burden of the work. The most pervasive fear, however, was the prospect of being judged by their peers during evaluations. Even though the peer assessments were limited to project groups with a shared goal, the students were still apprehensive about discussing their work. They viewed classwork in binary terms—either success or failure—without recognizing the value of failure as a learning opportunity. The fear of making mistakes left them paralyzed and passive, preventing them from taking responsibility for their education.

At this point, with approximately two-third of the semester remaining, it became imperative for the students to complete at least the mandatory tasks. As a result, the focus shifted from assessing the gamification process itself to addressing the students' fear of making mistakes through discussions held before each task. The goal was to help students overcome their apprehensions and build engagement.

To address this issue, I transitioned from being a teacher to adopting the role of a tutor. The first unexpected task assigned to students was to research and find examples of failures that were later turned into successes. These examples were often stories of famous individuals who had achieved success after overcoming initial failures. This task proved to be a turning point. For the first time since the semester began, the classroom filled with Polish students was filled with laughter. Additionally, we dedicated part of each week's class time to discussing upcoming tasks in greater detail. By analysing potential worst-case scenarios, students evaluated whether those scenarios could serve as a foundation for future improvement and whether it was better to encounter such situations in the safety of the classroom rather than for the first time in a real-world setting. Weekly reassurances that it was acceptable to make mistakes,

provided lessons were learned from them, helped introduce a mechanism of self-reflection.

At the end of the semester, students completed their group work and submitted teacher evaluation questionnaires. The international students gave each other the highest possible marks, effectively highlighting both their own strengths and those of their peers, as well as the roles each played during the course. The course itself also received high praise. Among the student comments were: "Even the least interested person will want to learn something from you," and "She is a great professor both in the lab and in theoretical lectures. Her kind attitude toward students and the way she conducted classes and labs made me want to attend all of them. The classes sparked my curiosity and encouraged me to explore the topics further. I would definitely take courses from Bozena every semester."

Polish students rated their progress and attitude as highly as the international students. We collectively agreed to assess their development after the intervention implemented mid-semester. Among the comments evaluating the instructor were statements such as, "these are classes we've never experienced before," alongside feedback expressing a preference for instructor-led evaluations: "students should be evaluated only by the teacher because peer evaluations are based on personal preferences, whether they like or dislike someone, which only you can provide fairly."

As a result of the course modification, the following objectives were successfully achieved:

- 100 % attendance was maintained across all groups, regardless of the students' nationality;
- students of experimental science simultaneously developed both soft and hard skills;
- English-speaking students remained actively engaged throughout the semester, demonstrating excellent collaboration and mutual motivation, which resulted in top academic performance;

- among the Polish-speaking students, the quality of assignments improved by more than 50 % during the semester, and the majority of students passed the exam on the first attempt;
- students began to engage in reflective practices regarding their own work.

4. Conclusions

This paper sought to examine an effort to engage students through a course modification incorporating gamification to address their passive behaviour. In addition to the insights into gamification highlighted by various authors in observational studies, the key findings of the present study are as follows:

- gamification emerged as an ideal teaching method for students who are motivated to acquire new skills and open to feedback on how to improve;
- for high-achieving and ambitious students, gamification can present a challenge, as they may feel compelled to complete all optional tasks even when it is not necessary;
- students who lack confidence may struggle to fully engage with a new pedagogical approach, particularly one they have not previously encountered;
- students who initially resist new teaching methods, particularly those requiring creativity and initiative, may benefit from explicit permission to make mistakes, as long as they are encouraged to learn from them;

In conclusion, the redesign of a course is far more complex than merely adding a variety of activities and expecting successful outcomes. To accurately assess the effectiveness of course modifications, it is essential to continuously monitor their impact on students' attitudes and performance through-

out the semester, rather than waiting until the end of the course.

What was unexpected? The realization that allowing students to make mistakes significantly enhances their engagement in class, equating it to their enthusiasm for activities outside the university. The most important insight I would like to share is that both teachers and students should be allowed to learn from their mistakes. Granting this permission fosters a positive learning environment and earns students' appreciation without diminishing the instructor's authority.

As Thomas Edison once said, "I have not failed 10,000 times – I've successfully found 10,000 ways that will not work."

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Good teaching practices on the example of chemistry teaching in non-chemistry studies

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Abstract

The article examines the primary pedagogical challenges currently encountered by university educators and explores selected instructional methods that can enhance the quality of education. It outlines specific strategies and interventions designed to increase student engagement during classes, with a particular focus on the case study involving Chemistry lectures for Sanitary Engineering students in the Environmental Engineering program within civil construction. The positive outcomes, both in terms of activating student participation and improving learning efficiency, were corroborated over several years of observation. The findings demonstrate that, with an appropriate pedagogical approach, it is possible not only to impart knowledge but also to foster engagement, motivation, and positive relationships that contribute to the holistic development of students. The article highlights the importance of continuous improving of educators' teaching competencies and adapting curricula and instructional methods in order to meet the rapidly evolving demands of the labour market.

Keywords

teaching, higher education, activating methods, chemistry

Dobre praktyki dydaktyczne na przykładzie dydaktyki chemii na studiach niechemicznych

Abstrakt

W artykule przeanalizowano główne problemy dydaktyczne, z jakimi borykają się obecnie dydaktycy na uczelniach wyższych, a także omówiono wybrane metody dydaktyczne, które mogą przyczynić się do poprawy jakości kształcenia. Opisano konkretne strategie i działania podejmowane w celu zwiększania zaangażowania studentów podczas zajęć na przykładzie wykładu z Chemii Sanitarnej prowadzonego dla studentów kierunku Inżynieria środowiska w budownictwie. Pozytywne efekty zarówno w aktywizacji słuchaczy, jak i we wzroście efektywności przyswajania przez nich wiedzy potwierdzono kilkuletnimi obserwacjami. Udowodniono, że dzięki odpowiedniemu podejściu można nie tylko przekazywać wiedzę, ale także budować zaangażowanie, motywację i pozytywne relacje, które wspierają ogólny rozwój studentów. Podkreślono potrzebę ciągłego doskonalenia kompetencji dydaktycznych nauczycieli oraz adaptacji programów i metod nauczania do dynamicznie zmieniających się potrzeb rynku pracy.

Słowa kluczowe

dydaktyka, szkolnictwo wyższe, metody aktywizujące, chemia

1. Introduction

According to The Framework for 21st Century Learning, developed by The Partnership for 21st Century Learning, we should now vigorously pursue a paradigm shift from school-centred education to student-centred education (The Partnership for 21st

Century Learning, 2019). The contemporary teaching process at universities has evolved significantly compared to the period when many current lecturers received their own training. The rapidly changing world, the dynamic advancement of technology, the increasing demands of the labour market, and the changing student expectations require universities to adapt to these new realities. Consequently, achieving a balance that satisfies both parties involved in the educational process – students and educators – often proves challenging. To this end, it is essential to promote and implement educational policies and practices based on innovative teaching methods that support the development of competencies that ensure that students meet the challenges of the 21st century. The Framework defines the skills, knowledge, experiences, and support systems that students need today to succeed in work, private life, and civic engagement. Key skills include a broad set of competencies, including creativity, communication, collaboration, entrepreneurship, soft skills and critical thinking.

Many researchers (Qi 2024; Arsyad 2024: 2) emphasize the key role of developing critical thinking skills in chemistry didactics for success and innovation in many sectors where chemical knowledge is essential (pharmacy, environmental sciences). In the Polish higher educational system, traditionally, the main form of teaching is the lecture and students usually adopt a passive stance during it, both physically and cognitively. Namely, this form of teaching is economical in terms of cost and time, as it can be used to teach a large number of students simultaneously. However, it does not provide a basis for active engagement of students in the learning process. Students passively take notes, often without being allowed to interrupt the lecturer to clarify issues they do not understand.

The article presents a number of practices developed to meet the above-mentioned challenges to ensure the quality of education and efficiency of the lecture. The project concerns lectures on *Chemistry for Sanitary Engineering* delivered to students in the first semester of the course *Environmental Engineering in Civil Construction*. For years the failure to pass this subject has

seemed to be one of the significant reasons for the drop-out phenomenon among the first-year students. The following techniques and methods are designed to enhance students' engagement in the acquisition of chemical knowledge, increase learning efficiency, and, consequently, improve academic performance and success rates in the subject. Furthermore, these approaches aim to inspire students to continue studies in the field.

2. How it all started: Good and poor learner studies

Effective teaching practices are essential for fostering successful learning outcomes. Outlined below are the foundational principles essential for consideration when efforts to enhance the educational process in the 21st century are taken into account (Khahro 2022: 14; Rahman 2022: 17).

Without any doubt, there are clear and understandable learning objectives and contextualization of learning that shall start the discussion about good practices. Namely, an increasing number of young individuals are prioritizing the acquisition of skills and competencies that will obviously have direct relevance to their future careers or daily lives. This pragmatic approach is understandable in a rapidly developing world, where time and resources are limited, and employment prospects are contingent upon specific skill sets rather than solely on the credentials of a diploma. Consequently, as Sewagegn (2020: 8) points out, it is essential within the teaching process to clearly articulate learning objectives both at the outset of a course and prior to the introduction of each new topic. Students should be aware of the expected outcomes and what they are expected to achieve by the end of the course. Furthermore, the realization of these objectives should be measurable and attainable, enabling students to effectively track their progress and engage in self-assessment.

Moreover, lecturers should consistently emphasize how the material being discussed can be applied in various professional and everyday contexts. Demonstrating the practical relevance of

theoretical concepts enhances students' engagement and motivation to learn. Students, in particular, show significant interest in working on real-world problems through case studies, as this allows them to observe the practical implementation of theoretical knowledge. Such an approach not only aids in their understanding of the subject matter but also underscores the importance and relevance of the material being taught.

Additionally, promoting a holistic approach, namely, balancing pragmatism with general knowledge plays a crucial role in the educational process of the university students. While students may tend to focus on acquiring knowledge, they consider immediately relevant, it is essential at the university level also to promote a well-rounded education that fosters development within a broader social, cultural, and ethical framework. Thus, when maintaining an emphasis on pragmatism, it is equally important to highlight the potential long-term benefits of broad knowledge and diverse skills, which can unexpectedly advance both their careers and personal lives by enabling them to better comprehend the world and make informed decisions. In this context, incorporating personal anecdotes and experiences, commonly referred to as "storytelling," proves particularly effective in conveying these broader educational values.

Another issue that has its enormous significance for the educational process is the use of modern technology. Today's young generation, having grown up in the digital age, naturally enters higher education with the expectation of having digital technologies included into the teaching process. However, research has shown that this expectation often encounters resistance from teaching staff, reluctant to adopt new instructional methods (Anis 2024: 6). Many lecturers continue to value only traditional teaching approaches, such as lectures that primarily focus on the transmission of theoretical knowledge. Moreover, educators who were themselves taught by the use of more conventional methods frequently struggle to accept that these "older" teaching techniques may no longer appeal to the contemporary students or achieve similar positive outcomes. In conversations with experienced educators, one often hears

criticisms of modern, more active teaching methods, which are sometimes dismissed as “childish,” “primitive,” or simply “a waste of time.”

Moreover, lecturers who have used traditional forms of instruction for many years may face considerable challenges in adapting to the evolving educational landscape. Namely, their resistance can stem from a variety of factors, including insufficient digital literacy, fear of change, or an ingrained preference for familiar methods. In order to facilitate the successful implementation of contemporary teaching approaches, it is crucial to offer instructors adequate support, training, and incentives to embrace innovation in their teaching practices. However, one critical barrier to this transition is the lack of time, which is often in short supply.

In disciplines such as chemistry, the use of modern technological tools, including 3D visualizations, mobile applications, and interactive learning programs, can significantly improve students' comprehension of complex topics and foster their creative thinking. For example, apps that simulate chemical reactions enable students not only to observe interactions between substances but also to analyse the outcomes in real-time. Additionally, remote laboratories and computer simulations can greatly enrich the learning experience while simultaneously reducing educational costs. These advancements demonstrate the potential of digital technologies to transform traditional learning environments into more dynamic, engaging, and cost-effective educational settings.

Marchak et al. (2021: 98) have shown that also in chemistry didactics it is possible to make effective use of all the AI possibilities and online teaching tools while maintaining pedagogical diversity and flexibility, and offering creative and active strategies for learning chemistry, at the same time maintaining social relationships between students and teachers. According to Dingel et al. (2023), strong relationships with students are fundamental to an effective teaching process. It is essential to make an effort to understand an individual student and foster a rapport based on mutual respect, as this can significantly enhance

their engagement and motivation to learn. An empathetic approach is crucial in this regard – being open to students' perspectives and concerns, while offering understanding and support, can contribute positively to their academic experience. It is also important to remain aware of the fact that students may face a range of academic and personal challenges, which can affect their performance and overall well-being.

However, the process of cultivating positive relationships extends beyond the dynamic between the lecturer and students; equally important are the interactions among students within a group. The author's experience suggests that a cohesive group functions more effectively, if there are students who participated in team-building activities during their initial classes in the first year of study often achieving higher academic performance across various subjects in subsequent years, compared to those who began their studies through conventional methods. This observation is further corroborated by student feedback collected through surveys, which consistently highlights the benefits of early group cohesion for a long-term academic success.

As follows, a fundamental prerequisite for fostering students' openness to learning is the creation of a supportive and welcoming atmosphere in the classroom. Without any doubt, fear can inhibit cognitive function and hinder the learning process. Ideally, then, the classroom environment should encourage students to feel comfortable asking questions and expressing their opinions, even if those contributions may be factually incorrect. Furthermore, it is equally crucial to ensure that certain negative behaviours – such as judgment, criticism, sarcasm, ridicule, labelling, and dismissal – are avoided in interactions with students. This necessitates careful attention to both the content and manner of communication, as well as ongoing efforts to ensure that the message is correctly interpreted by the students.

It must be pointed out that effective communication is crucial for fostering positive relationships with students and plays an essential role in the teaching and learning process. Moreover, it is important to be clear and precise when communicating with students, particularly when addressing complex topics or pro-

viding task instructions. One can do it by means of simplifying explanations, and avoiding unnecessary complications is the key. Additionally, employing real-life examples, analogies, and visual aids, as previously mentioned, often yields positive results.

To ensure effective communication with students, it is advisable to establish clear communication channels, such as email, educational platforms, or in-person and virtual meetings, along with clearly defined consultation hours. Furthermore, it is imperative to provide timely responses to student inquiries, ideally within 24 to 48 hours. Such promptness not only reflects the lecturer's commitment and professionalism but also indicates sensitivity to student needs, thereby inspiring respect and strengthening the student-lecturer relationship.

Treating students with respect is a fundamental aspect of building positive relationships, it warrants good atmosphere conducive to learning in the current educational climate. In the 20th century, academic practice predominantly required respect to be shown unilaterally, with students being expected to show respect towards their teachers. However, contemporary standards demand that respect be reciprocated equally between students and educators. To effectively show respect towards students, educators should engage in practices such as soliciting students' opinions on relevant topics, attentively listening to their contributions, requesting clarification of or elaboration on where necessary, and providing constructive feedback.

The current generation of young adults exhibits a different perspective on the external world, interpersonal relationships, and their expectations of educational environments. A decade ago, incorporating humour related to course content into lectures often produced positive outcomes. However, in recent years, there has been an increasing trend when students not only fail to appreciate previously effective jokes but also perceive them as inappropriate or even personally offensive, as reflected in the feedback from class surveys. Therefore, when opting to include humour in the classroom, it is crucial to exercise careful judgment and sensitivity to the context.

Additionally, it is considered a good practice to solicit student feedback regarding the effectiveness of the classes. This can be achieved through surveys, brief questions at the end of class, or direct conversations. Such feedback provides valuable insights, enabling continuous improvement in teaching methods and communication approaches.

An essential component of effective communication with students involves providing timely and constructive feedback. It is advisable to regularly inform students of their progress through mechanisms such as interim grades, written comments on assignments, or progress reports. This practice enables students to monitor their advancement towards achieving their educational objectives. Simultaneously, fostering self-reflection – an important skill that many contemporary students lack – should be encouraged. According to Carless et al. (2020: 28), supporting students in self-assessment of their performance and identifying areas for improvement is crucial in developing this competency.

In numerous instances, it is essential to offer individualized support to students, either in terms of academic content or in the area of personal development. Whenever feasible, universities should aim to provide students with access to mentors who can assist them in identifying the skills and knowledge most beneficial for their future careers. This personalized learning approach enables students to concentrate on key areas critical to shaping their individual career paths and achieving their goals (Ghulam 2024:1).

Furthermore, in individual face-to-face consultations, it is crucial to personalize communication, ensuring that the mode of interaction is tailored to the specific needs of each student. In this context, flexibility and openness to adjustments are particularly valuable. By adopting these strategies, educational institutions can effectively meet the diverse needs of students, thereby providing comprehensive and meaningful education that equips them not only for their initial employment but also for a long-term career success and life in the changing world.

3. Educational project

The primary aim of the project under discussion was to enhance and address the modern pedagogical challenges associated with the lectures on *Chemistry for Sanitary Engineering*, delivered during the first semester of the *Environmental Engineering in Civil Construction* program. Observations were conducted over four academic years, from October 2020 to June 2024. However, data from the 2020/2021 academic year were excluded from the study, as the course was predominantly delivered online, and student behaviour during this period was deemed unrepresentative of typical classroom dynamics. The study involved groups ranging from 20 to 40 students. Despite the lecture format, both theoretical concepts and practical tasks, including test problems and equation solving, were integrated into the sessions.

The key teaching challenges encountered in the project are discussed below, along with the methods that were introduced to address them:

1. a significant variation in the level of students' prior knowledge;
2. the absence of student motivation, coupled with the inability to contextualize the subject within its broader disciplinary framework and to relate it to other subjects in the core curriculum;
3. the lack of student involvement during lectures;
4. the lack of critical thinking skills;
6. the lack of time to absorb or repeat material at home.

3.1. A significant variation in the level of students' prior knowledge

A significant number of students entering higher education are insufficiently prepared for its academic demands, which often leads to learning difficulties and increased dropout rates. In the

field of study under examination, there is a notable disparity between high school graduates from biologically and chemically focused curricula, and technical school graduates with specializations in geodesy or renewable energy. The former group possesses a substantial foundation in chemistry, covering much of the material included in the course, whereas the latter may struggle to recall even basic chemical symbols. This wide variation in students' prior knowledge presents a considerable challenge for the lecturer. The primary question is how to make the subject matter accessible to students who arrive with minimal chemistry background, while simultaneously ensuring that those who have completed advanced chemistry courses, such as the baccalaureate exam, are neither disengaged nor bored.

To address this disparity, the project implemented several techniques aimed at individualizing instruction, thereby adapting the educational content and methods to meet the specific needs and abilities of the students. These techniques included the following:

(a) students were divided into two groups: a more advanced group and a less advanced group;
(b) for the more advanced students, specialized tasks were prepared that extended beyond the standard curriculum requirements. These students could work on these tasks independently during the lecture while retaining the flexibility to follow the lecture content at their discretion;
(c) less advanced students were required to actively engage with the lecture material and participate in class activities;
(d students were allowed to self-select their group based on their self-assessment of their knowledge in the relevant subject matter;
(e) students were also permitted to switch groups as needed, depending on their level of knowledge in relation to specific topics.

This approach was designed to offer a customized learning experience that accounted for the varied levels of prior knowledge

within the student group. To ensure all students' comprehendsion of the material, a specific strategy was implemented for those with less advanced understanding. Students who felt uncertain about the topic were encouraged to work on problems at the blackboard, while those with partial understanding were tasked with solving the exercises independently in their notebooks. Over the years, this method has demonstrated its effectiveness, typically requiring only one lecture for students to adapt to the process. In subsequent lectures, students voluntarily approached the board, often competing to display their limited understanding, a behaviour indicative of a classroom environment that promotes inquiry and open discussion. Once a student successfully solved a problem at the board, the solution was compared to the work completed independently by other students to ensure consistency and accuracy.

For the more advanced group, modern pedagogical techniques and digital tools were used, such as software for simulating chemical molecules (e.g., 3D visualizations), audiovisual materials available online, educational games, and group-based problem-solving tasks. These methods not only facilitate a deeper understanding of the subject but also provide opportunities for student interaction, encouraging the exchange of knowledge and ideas. This collaborative process enhances communication skills and promotes the development of effective teamwork.

3.2. The absence of student motivation, coupled with the inability to contextualize the subject within its broader disciplinary framework and to relate it to other subjects in the core curriculum, presents a significant challenge.

A common issue in higher education is the low levels of student motivation and engagement. Many students adopt an instrumental approach to learning, focusing primarily on obtaining a diploma rather than on genuinely enhancing their knowledge and skills. This phenomenon is particularly evident among

students of environmental engineering in construction, the majority of whom view their future careers as primarily concerned with the design of sanitary systems. A relatively small proportion of students, typically around 10 %, express an interest in technological processes. Consequently, many students perceive the study of chemistry as an unnecessary burden, disconnected from the core focus of their academic program.

A key challenge, therefore, is to cultivate students' interest in the subject and to emphasize that an elementary understanding of chemical processes – and, at more advanced stages, technological processes – is essential to the broader field of environmental engineering. Additionally, an overly narrow specialization may lead to fragmented knowledge and a reduced ability to engage in holistic thinking, both of which are critical for success in the discipline.

Consequently, significant emphasis was placed on addressing this challenge within the instructional process. For each topic introduced, the relevance of the specific area of knowledge to future academic pursuits or professional practice was highlighted. By illustrating the connections between chemistry and other disciplines, such as biology, physics, and engineering, students were able to gain a better understanding of how their chemical knowledge could be applied to solving real-world problems.

Furthermore, students were actively encouraged to engage in information sharing and discussions whenever possible. For example, at the beginning of a lecture on pH, rather than offering a preliminary explanation of the concept or associated terms, students were asked where they encountered the term "pH" in their daily lives. It became apparent that while the students did not fully understand the scientific concept of pH, they frequently encountered it in various contexts, particularly in advertisements for hygiene products, food items, and pharmaceuticals. By highlighting that they already possessed a degree of familiarity with the topic, grounded in real-world applications, their interest in the subject was heightened. This strategy effectively

stimulated their engagement and maintained active participation throughout the lecture.

3.3. The lack of students' engagement during lectures

To encourage students to take a greater interest in the material presented during lectures, each session concluded with a brief summary of the content using an interactive quiz facilitated by applications such as Kahoot or Mentimeter. The top three students who scored the highest points in each quiz were tracked, and their cumulative scores were recorded at the end of the semester. Since students participated using anonymous nicknames, their individual scores remained unknown until the conclusion of the course, which provided additional motivation for competition while simultaneously encouraging permanent engagement with the lecture material. Ultimately, those students who accumulated the highest number of points received a higher grade for the course.

A valuable opportunity to bridge theoretical knowledge with practical applications, thereby enhancing student engagement, emerges in the discussions of environmental issues within the framework of chemistry instruction. For example, when teaching about different types of oxides, discussions were consistently invigorated by examining their role in the formation of smog, acid rain, and the greenhouse effect, as well as their broader implications for contemporary environmental challenges. This timely and relevant subject matter not only stimulated enthusiastic debates but also encouraged students to pursue further independent research on the topic.

3.4. The lack of critical thinking skills

Teaching of chemistry should prioritize the development of analytical skills and the cultivation of critical thinking abilities. The aforementioned integration of instructor-led debates and case analyses within the lecture structure strengthens students'

ability to critically assess data and make evidence-based decisions.

3.5. The lack of time to absorb and repeat the material at home

The traditional approach to studying, which often involved spending long hours in libraries searching for reference materials, has largely been replaced by the widespread availability of digital educational resources, such as e-books, e-learning platforms, video lectures, and simulations. Consequently, educators, including those in higher education, must put in additional effort to engage students, which presents a particular challenge in lecture-based teaching.

In the context of chemistry education, it is crucial that students systematically assimilate the material, as each successive topic builds upon the understanding of preceding concepts. This necessitates consistent reinforcement and consolidation of acquired knowledge on the part of the student. However, in the contemporary academic environment, students increasingly balance their studies with work or other extracurricular commitments. Many undertake part-time employment alongside their academic pursuits, and in recent years, some also begin working in roles related to their future profession. Therefore, it is imperative to ensure that students gain as much relevant knowledge and practical skills from their university experience as possible, preparing them for both their immediate academic challenges and their future careers.

The project was based on the assumption that students do not engage in reviewing material from previous classes at home, and consequently implemented the following strategies to facilitate the assimilation and consolidation of knowledge:

(a) at the beginning of each lecture, three minutes were dedicated to revisiting the material covered in the previous session, providing a brief summary, and emphasizing how the

previous topic is connected to the current lecture's content.

(b) at the conclusion of each lecture, as previously mentioned, the most relevant points were summarized through an interactive quiz. Importantly, after all students had answered the quiz questions, a discussion of the responses followed, starting with the incorrect answers, with clear explanations provided to highlight the nature of the errors.

(c) key content and self-practice exercises were made available on the e-learning platform, ensuring that students could access the teaching materials at their convenience, from any location and at any time.

4. Observations

The implementation of the described teaching strategies and methods resulted in a notable improvement in the quality of education, both qualitatively and quantitatively, compared to previous years. Namely, as far as the qualitative aspects are taken into consideration, a significantly greater number of students began actively participating in classes and demonstrated an increased interest in relating lecture topics to real-world events. Moreover, many students continued to engage with the material beyond the classroom, frequently sharing recent news articles, particularly on environmental issues, with the author even after the course had concluded. Additionally, a considerable number of students explicitly reported a marked improvement in their attitude towards the subject of chemistry.

From a quantitative perspective, in previous years, approximately 80 % of students enrolled in the Chemistry for Sanitary Engineering course took the first available exam, with an average of 20 % passing on their first attempt. Following the implementation of the new teaching methods, nearly 100 % of students now take the first exam, with approximately 40 % passing on their first attempt. This reflects an increase in the pass rate by over 20 %. According to the author, this indicates a significant shift in students' attitudes towards the subject, as they

demonstrate greater openness and interest in chemistry, which leads to a more confident approach to assessing their knowledge. A positive upward trend was also noted with regard to the grades received – compared to the situation before the experiment, the average exam grade (calculated for grades received during the 3 possible attempts) increased from 3.2 to 3.5. There was also a roughly 10 % improvement in the average exam grade.

5. Conclusions

Higher education is currently facing numerous challenges due to significant global transformations in the social, technological, economic, and political spheres. As follows, these challenges demand that institutions of higher education adapt quickly and effectively to ensure the continued relevance and quality of the instruction they offer. Specifically, these global shifts are reshaping the skills and competencies required for students to succeed in an increasingly complex and interconnected world. In response to these evolving demands, educators have sought innovations by developing and implementing modern pedagogical methods that can better equip students for both academic success and professional adaptability, which seems especially critical in fields like chemistry, where the rapid advancement of science and technology necessitates continual updates in teaching approaches.

In recent years, various modern pedagogical techniques have been introduced to enhance the teaching of chemistry at the university level, particularly within specialized courses such as *Chemistry for Sanitary Engineering* in the *Environmental Engineering in Civil Construction* program. Traditional lecture-based teaching methods, which primarily involve the passive transmission of theoretical knowledge, have proven insufficient in meeting the needs of today's students. Students increasingly expect a more engaging, interactive, and applied learning experience that not only conveys knowledge but also equips them with practical skills relevant to their future careers. In response to

these expectations, contemporary didactic approaches emphasize student-centred teaching, critical thinking, and the application of knowledge in real-life situations.

One of the primary objectives of implementing modern teaching strategies in chemistry education has been to improve teaching efficiency and, by extension, student learning outcomes. The move toward interactive and engaging methods has demonstrated considerable potential in fostering a deeper understanding of complex chemical concepts, which are often abstract and difficult for students to grasp through traditional lectures alone. By integrating practical activities such as laboratory simulations, real-world case studies, and problem-based learning, students are not only able to understand the theoretical underpinnings of chemistry but also see how these principles are applied in real-world engineering contexts.

For instance, in the context of teaching Chemistry for Sanitary Engineering, case studies related to environmental challenges such as water treatment, waste management, and pollution control provide students with a practical framework for understanding how chemical processes are integral to solving contemporary engineering problems. This applied approach not only increases the relevance of the subject matter to students but also enhances their motivation to engage with the content.

Moreover, the introduction of interactive technologies, such as e-learning platforms, 3D simulations, and virtual laboratories, has significantly transformed the learning environment. These tools allow students to visualize complex molecular structures and chemical reactions in a way that was previously impossible in a traditional classroom setting. For example, 3D simulations can help students explore the spatial orientation of molecules, enabling them to better understand stereochemistry and reaction mechanisms. Virtual laboratories also offer students the opportunity to perform experiments in a controlled, risk-free environment, where they can make mistakes and learn from them without the constraints of physical lab resources.

In addition to technological innovations, modern pedagogical methods in chemistry education place a strong emphasis on the

development of critical thinking skills. Unlike rote memorization, which was often emphasized in traditional chemistry instruction, critical thinking encourages students to analyse, evaluate, and synthesize information from multiple sources. This approach is particularly beneficial in fostering scientific inquiry, as students learn to question assumptions, formulate hypotheses, and draw evidence-based conclusions. Encouraging critical thinking prepares students not only for academic success but also for professional challenges, where problem-solving and adaptability are essential skills in a rapidly changing world.

The implementation of these contemporary teaching strategies has produced positive results in terms of both student engagement and satisfaction. In the specific context of the Chemistry for Sanitary Engineering course, student feedback has consistently indicated that the integration of real-world examples, interactive technologies, and problem-solving activities have enhanced the accessibility and making us of the material. Moreover, quantitative data has demonstrated improvements in exam performance, pass rates, and overall course satisfaction.

Nevertheless, the successful implementation of these teaching methods also presents certain challenges. One of the primary concerns is the need for ongoing evaluation and adaptation. While the initial results of these methods are promising, it is crucial to continuously monitor their effectiveness in response to changing educational conditions and student needs. For example, as new technologies emerge and societal demands evolve, educators must remain flexible and open to incorporating new tools and techniques into their teaching practice. Furthermore, there is a need for more research into the long-term impacts of these methods on student learning outcomes and professional development. While short-term improvements in engagement and satisfaction are encouraging, it is important to determine whether these methods ultimately lead to better career readiness and lifelong learning.

In conclusion, modern pedagogical methods in higher education are not only a response to the shifting demands of the educational landscape but also a critical tool for preparing future

graduates to thrive in an increasingly complex world. By integrating interactive technologies, real-world applications, and a focus on critical thinking, educators can provide a more effective and inspiring learning experience for students. However, the continued success of these methods depends on their ongoing evaluation and adaptation to ensure they meet the evolving needs of both students and the broader society. As higher education institutions continue to confront global challenges, the ability to innovate and adapt teaching practices will remain essential to fostering the next generation of skilled professionals and critical thinkers.

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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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Peer tutoring and peer feedback: Effective methods of support for students in the academic environment

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Abstract

This paper investigates the challenges faced by contemporary universities and highlights the need for innovative educational strategies in response to social, cultural, and environmental changes. As the Internet shifts the role of educators from sole knowledge providers to facilitators of student-centred learning, peer tutoring and peer feedback emerge as pivotal methods for enhancing academic success and personal growth.

Central to this discussion are two case studies from the University of Groningen's Masters of Didactics program in 2022-2023, which illustrates a practical application of these strategies. The paper also reviews theoretical foundations of these methods, drawing on constructivist learning theories and Zone of Proximal Development. Key elements for successful implementation of the strategies discussed in the case studies include trained tutors, well-informed students, structured sessions, personalized support and continuous feedback. These

characteristics not only enhance the learning experience but also cultivate essential interpersonal skills.

Our findings underscore the positive impact of integrating peer tutoring and feedback on student engagement, collaboration, and academic performance. This paper advocates for the widespread adoption of these pedagogical approaches in higher education, emphasizing their role in creating an inclusive and effective learning environment that prepares students for future academic and professional challenges.

Keywords

Masters of Didactics, peer tutoring, peer feedback, higher education

Tutoring rówieśniczy i feedback rówieśniczy: Efektywne metody wsparcia studentów w środowisku akademickim

Abstrakt

Niniejszy artykuł odnosi się do wyzwań, przed którymi stoją współczesne uniwersytety i podkreśla potrzebę innowacyjnych strategii edukacyjnych w odpowiedzi na zmiany społeczne, kulturowe i środowiskowe. W miarę jak Internet zmienia rolę edukatorów z wyłącznych źródeł wiedzy na moderatorów uczenia się skoncentrowanego na studencie, tutoring rówieśniczy i feedback rówieśniczy stają się kluczowymi metodami wspierania sukcesów akademickich i osobistego rozwoju.

Centralnym elementem niniejszej dyskusji są dwa studia przypadków zrealizowane w ramach programu Masters of Didactics na Uniwersytecie w Groningen w latach 2022-2023, które ilustrują praktyczne zastosowanie omawianych strategii. Artykuł przedstawia również teoretyczne podstawy tych metod, opierając się na konstruktywistycznych teoriach uczenia się oraz koncepcji strefy najbliższego rozwoju. Kluczowe aspekty skutecznej implementacji strategii opisanych w studiach przypadków obejmują zaangażowanie wykwalifikowanych

tutorów, odpowiednio przygotowanych studentów, dobrze zorganizowane sesje, spersonalizowane wsparcie oraz ciągłe przekazywanie informacji zwrotnych. Elementy te nie tylko wzbogacają proces uczenia się, lecz także wspierają rozwój kluczowych umiejętności interpersonalnych.

Nasze doświadczenia podkreślają pozytywny wpływ integracji tutoringu rówieśniczego i feedbacku rówieśniczego na zaangażowanie studentów, współpracę i wyniki akademickie. Artykuł opowiada się za szerokim wprowadzeniem tych podejść pedagogicznych w szkolnictwie wyższym, podkreślając ich rolę w tworzeniu inkluzywnego i skutecznego środowiska edukacyjnego, które przygotowuje studentów do przyszłych wyzwań akademickich i zawodowych.

Słowa kluczowe

Mistrzowie Dydaktyki, tutoring rówieśniczy, feedback rówieśniczy, edukacja wyższa

1. Introduction

The contemporary university, as an educational institution, must meet the challenges posed by the social, cultural, and environmental changes of the modern world. Consequently, adjustments in the academic didactic approaches have become necessary. A primary reason for this shift is the advent of the Internet, which has rendered teachers no longer the sole source of information and has provided relatively easy access to a vast amount of information. However, for academic instructors, who are responsible for passing both knowledge and skills to their students, the focus remains steadfastly on the students themselves.

Supporting students, particularly through implementation of peer tutoring, is pivotal in advancing both academic success and personal development. Peer tutoring, defined as a process wherein students assist one another in comprehending and mastering course material, cultivates a collaborative learning

environment that yields substantial benefits for both the tutor and the tutee. This pedagogical approach not only consolidates the tutor's knowledge and bolsters their confidence but also offers the tutee tailored and relatable guidance. Moreover, peer tutoring fosters a sense of community and belonging, motivating students to actively engage in their educational journey and to hone essential interpersonal skills. By capitalizing on the strengths and perspectives of their peers, students in a peer tutoring framework contribute to a dynamic and supportive academic milieu, ultimately facilitating their own comprehensive development.

Another crucial support method in higher education is peer feedback. This method involves students providing constructive comments on each other's work, thereby fostering mutual learning and continuous improvement. The process helps students gain diverse perspectives and enhances their critical thinking and self-reflection skills. Through peer feedback, students actively contribute to their peers' learning while also improving their own assessment abilities. This approach promotes greater academic independence and self-regulation. Furthermore, peer feedback encourages collaboration and respect, empowering students to communicate effectively and appreciate different viewpoints. By integrating peer feedback into the academic environment, students benefit not only from peer tutoring but also from a richer, more holistic approach to learning and personal growth.

As follows, the research question of the current work assumes that peer tutoring and peer feedback exemplify effective educational strategies that are applicable in the academic environment. The following sections, then, will focus on the two aforementioned support methods for students. Each of these projects is presented systematically: first, teaching philosophy statements will be provided, offering individual reflections on academic didactics from the perspective of academic instructors. Finally, each project is described individually, accompanied by post-project comments and reflections.

2. Tutoring – the review of concepts and approaches

Tutoring in higher education has evolved into a sophisticated pedagogical practice that is integral to student success and institutional effectiveness. One of the fundamental assumptions of tutoring in higher education is derived from the constructivist learning theory, which posits that learners construct their own understanding and knowledge of the world, through experiencing things and reflecting on those experiences (Fosnot and Perry 2005). In consequence, what becomes prominent is active engagement and interaction, suggesting that students learn more effectively when they are involved in the learning process rather than passively receiving information. Yet, in Vygotsky's concept of the Zone of Proximal Development (ZPD) seems critical to the practice of tutoring since it suggests that learners can achieve higher levels of understanding and skill when they receive guidance from someone more knowledgeable (Vygotsky 1978). As follows, in the context of higher education, tutors help bridge the gap between what students can do independently and what they can achieve with assistance.

Identifying and eventually filling this gap means scaffolding, which as another key assumption, involves providing temporary support to students until they can perform tasks independently. This concept is central to effective tutoring, where the tutor's role is to gradually remove support as the learner becomes more competent (Wood, Bruner and Ross 1976). In context of higher education, this often translates to tutors helping students develop study skills, understand complex concepts, and build confidence in their abilities.

Additionally, what seems also crucial as far as the focus of the current work is concerned, tutoring (as well as peer feedback) in higher education also assumes that learning is enhanced through peer interaction and collaboration. As peer learning theories suggest, students can benefit significantly from learning with and from each other (Boud et al. 2014) and tutors, often peers themselves, provide a relatable and sup-

portive learning environment that encourages collaboration and mutual learning.

Moreover, one can enumerate the following elements that contribute to successful tutoring sessions:

a. trained tutors: qualified teachers/ tutors who are equipped with the necessary pedagogical skills, content knowledge, and interpersonal abilities to support their peers effectively, namely knowledgeable at communication skills, tutoring strategies, and methods for providing constructive feedback (Colvin 2007);
b. structured tutoring sessions: well-prepared meetings are essential for maximizing learning outcomes. As Topping (2009) points out, these sessions often follow a specific format that includes goal setting, active engagement in learning activities, and review of progress, which ensures that the sessions are focused and productive, providing a clear framework within which learning can occur;
c. personalized support: personalization is a hallmark of effective tutoring in higher education because tutors tailor their support to the individual needs of each student, addressing specific challenges and learning styles (García and Cohen 2012) mostly to allow students to grasp difficult concepts, develop critical thinking skills, and improve academic performance;
d. feedback and reflection: continuous feedback and opportunities as integral elements of tutoring help students understand their strengths and areas for improvement, while reflection encourages them to think critically about their learning processes (Hattie and Timperley 2007);
e. accessibility and inclusivity: a diverse student population can benefit from tutoring programs since these programmes aim to be accessible and inclusive, offering accommodation to different learning needs, cultural backgrounds, and academic disciplines (Thompson and Mazer 2012).

The above characteristics provide grounds for the application of tutoring in higher education, whose most significant goal is to provide academic support in such scope that includes tutors' assistance in understanding course material, preparing for exams, and completing assignments (Simão, Flores, Fernandes and Figueira 2008). Such support for students enhances also study skills, including time management, note-taking or possibly test preparation strategies, which beyond doubt are essential for academic success and allow students to become more independent and effective learners.

2.1. Peer tutoring

Taking into consideration the subject of the present work, special attention should be paid to peer-assisted learning strategies, among which peer tutoring occupies the central position. In addition to academic support provided by teachers-tutors, tutoring programmes often include peer tutoring where the role of a teacher is taken over by a fellow student. To be more precise, peer tutoring is an educational strategy that leverages the power of collaboration among students to enhance learning outcomes and, as in the case study below, it seems crucial for supporting at-risk students who may be struggling academically, socially or personally.

As far as core elements of peer tutoring are concerned, they include, similarly to tutoring:

1. structured interaction: clear guidelines and structured activities, which according to Topping (2009) help ensure that the tutoring sessions are productive;
2. role assignment: specific roles (a peer tutor and a peer tutee) are assigned, with each participant understanding their responsibilities (Duran 2017);
3. training: both peer tutors and peer tutees often require training in communication, instructional strategies, and feedback provision (Fuchs et al. 1994);

4. feedback mechanisms: regular feedback from both peers and supervisors helps in improving the effectiveness of the sessions (Cohen, Kulik and Kulik 1982).

Yet, peer tutoring differs from tutoring in one feature, namely in peer tutoring a significant role is ascribed to the teacher/supervisor who, on the one hand, is responsible for tutors and tutees training and, on the other hand, provides continuous assessment of the tutoring process and outcomes to ensure that the objectives of the program are being met (Goodlad and Hirst 1989). Moreover, according to Colvin (2010), peer tutors frequently take roles of mentors who provide guidance on navigating university life, balancing academic and personal responsibilities and accessing campus resources. Such strategy allows for developing not only skills connected with students' academic career, but also it strengthens social bonds among groups of students and promotes collaboration among them. This holistic support helps students adjust to the demands of higher education and fosters a sense of community and belonging.

As it has been presented above, tutoring and peer tutoring in higher education are multifaceted practices that rest on key educational assumptions, incorporate essential elements and have wide-ranging applications. The effectiveness of tutoring and peer tutoring is underpinned by constructivist learning theories, the principles of scaffolding, and the benefits of peer collaboration. Consequently, core elements such as trained tutors, structured sessions, personalized support, continuous feedback, and inclusivity are critical for the success of tutoring programmes. The applications of tutoring and peer tutoring are diverse, encompassing academic support, study skills development, writing assistance, peer mentoring, support for at-risk students, online tutoring, supplemental instruction, and preparation for graduate and professional exams.

3. Peer feedback – the review of concepts and approaches

One of the factors connected with tutoring or peer tutoring strategies is related to the way the work of tutees is evaluated, which means providing feedback by tutors. Since the major interest of the present work is also focused on the question of peer feedback, the following part aims at presenting key points by means of which peer feedback is recognized.

Peer feedback has gained prominence in higher education as a powerful pedagogical tool that enhances learning outcomes, fosters critical thinking, and promotes collaborative learning. Namely, peer feedback refers to the process by which students provide evaluative comments on each other's work or performance by involving students acting as both evaluators and recipients of feedback, facilitating a reciprocal learning experience. What follows is the strategy where peer feedback engages both parties in a constructive dialogue and interaction to enhance understanding and performance (Nicol 2010). This interaction takes various forms, from written comments on essays to oral feedback in presentations and collaborative projects.

Moreover, peer feedback, similarly to peer tutoring is rooted in the constructivism learning theory, according to which learners actively construct their knowledge thorough experience and interactions. Consequently, learning is a social process and understanding is built through cooperation and discussion (Fosnot 2005) and it is embodied in encouraging students to involve in each other's work critically and constructively. Additionally, peer feedback and peer tutoring share another common ground, which is the practice. Following Vigotsky's Zone of Proximal Development (1978), which represents the difference between what learners can do independently and what they can achieve from a more knowledgeable peer, peer feedback allows students to advance their comprehension skills by bridging gaps in knowledge and proficiency.

Furthermore, peer feedback is based on the assumption that evaluating others' work by means of formative assessment pro-

motes metacognitive development, which according to Nicol and Macfarlane-Dick (2006) requires from students to reflect on the criteria for high-quality work, self-regulatory skills and critical thinking. Moreover, this reflective practice is essential for developing a deeper understanding of academic standards and improving self-assessment capabilities. In consequence, peer feedback forwards positive interdependence by encouraging students to support each other's learning, creating a collaborative academic environment that is beneficial to all participants.

As has been presented thus far, peer feedback's goal is to consolidate students' knowledge and gain new insights from their peers' perspectives and as a result enhance the process of learning. Besides, evaluating peers' work requires students to apply analytical skills, assess the validity of arguments, and finally provide constructive criticism. Additionally, through the process of giving and receiving feedback, students learn to monitor their own learning, set goals, and make adjustments to improve their performance. Among other goals, peer feedback aims to build interpersonal and communication skills since providing feedback requires clear, respectful, and constructive communication, which is valuable in both academic and professional settings. Finally, peer feedback promotes collaborative learning by encouraging students to work together, share ideas, and learn from each other, which results in a sense of community and mutual support, influencing positively motivation and engagement in the learning process.

As far as practices are taken into consideration, peer feedback, similarly to peer tutoring, is organized in structured peer review sessions that involve students exchanging work and providing feedback based on specific criteria and guidelines. Hence, this strategy to be effective requires training and preparation, which means that students need to be taught how to provide constructive criticism, use feedback rubrics, and engage in reflective dialogue (Nicol et al. 2014). This helps to ensure that the feedback given by a fellow student is of good quality. What is more, an issue that is frequently mentioned in context of peer feedback is the question of anonymity that as Lu and Bol

(2007) point out can be a valuable practice, encouraging honesty and reducing bias. Because of the fact that anonymity helps mitigate the influence of personal relationships and social dynamics, students may feel more comfortable providing just comments that lead to more genuine and useful feedback. Finally, self-reflection on the feedback process encourages students to improve their own evaluative skills By reflecting on the feedback they give, students become more aware of their biases and areas for growth.

Furthermore, when discussing possible means of providing feedback, one cannot ignore the role of technology. Gikandi et al. (2011) highlight that using technology plays a significant role in facilitating peer feedback, especially in online and blended learning environments. It means that digital platforms and tools enable asynchronous feedback, allowing students to review and comment on each other's work at their convenience and support the organization and management of peer feedback processes.

One of advantages of peer feedback is the fact that reflective dialogue and iterative revision are crucial practices in receiving, asking for clarification or considering how to incorporate suggestions into students' works (Gielen et al. 2010). Also, studies have shown that students who engage in peer feedback perform better academically, demonstrating improved understanding and higher-quality work (Falchikov and Goldfinch 2000). Another point is that by reflecting on feedback, students learn to monitor their own performance, set goals, and make adjustments to improve their learning (Nicol and Macfarlane-Dick 2006). Additionally, providing and receiving feedback requires clear, respectful, and constructive communication valuable in both academic and professional settings by means of productive dialogue, negotiating meanings and handling criticisms constructively. Lastly, as Falchikov (2005) mentions, peer feedback is a cost-effective and scalable solution for providing formative assessment and feedback in higher education since peer feedback offers a sustainable way to provide high-quality feedback to a large number of students.

Summing up, peer feedback is a powerful pedagogical tool that plays a crucial role in higher education. Grounded in the constructivist learning theory, Vygotsky's ZPD, and social interdependence theory, it assumes that learning is an active, social process. As far as the goals and advantages of peer feedback are concerned, they include enhancing learning and understanding, developing critical and analytical thinking skills, fostering self-regulation and metacognition, building interpersonal and communication skills, and promoting collaborative learning. In addition, effective practices of peer feedback involve structured peer review sessions, training and preparation, anonymity in feedback, the use of technology, and reflective dialogue and iterative revision.

4. Case study

The following part is centred around two educational strategies that, as the research question assumes, are supportive tools for students in the academic environment. Both of these strategies were part of the Masters of Didactics- Advanced Teaching Qualifications Training realized in 2022-2023 by the University of Groningen and supervised by the Polish Ministry of Education. The presentation of the projects begins with Teaching Philosophy Statements, left as written originally in the first person singular, since this reflective approach to academic didactics serves as a driving force for the implementation of these projects. Next, stages and achievements of the projects are provided with final conclusions that propose a broad educational context for higher schools and benefits that may derive from introducing these projects on a large scale.

4.1. Peer tutoring project

4.1.1 Teaching Philosophy Statement of a supervisor of peer tutoring project

Actually, one of the reasons for my being a teacher is that I like working with students. It is important for me to observe and

follow their development along with the improvement of their skills. But also it is a good lesson for me since I can see if my methods really work. I hope that I manage to give them enough support to become good professionals and to enjoy their studies. Yet, I do not want to be to them 'another mother' or 'a friend' because to me a teacher's role is a completely different one- a guide in their metaphorical journey to professionalism and knowledge. That is why I approach my students with respect but constantly I remind them of my role. What follows, my role is inevitably connected with passing knowledge in the way that is the most appropriate both for the course and for the students. That is why I do care about innovations and technology that can come in handy. One of the reasons is that most of my courses require a computer lab and what results from this fact is that I can have a relatively easy access to a number of tools and software.

As far as the very teaching is concerned, I particularly value applications useful for self-studying and testing. Additionally, if it is possible my students are invited to join some extracurricular activities that are connected with language and linguistics. Those of them who are at my MA seminar in linguistic aspects of NLP are encouraged to use my articles if the articles meet the topic of their thesis. Since I started my teacher training programme some time ago, the question that I have had to answer relatively often is why I do things this particular way. I suppose the response to it is that I have worked this way out for many years of teaching experience. It means that if in my opinion things did not work they way I wanted, I modified either my methods or the contents of my courses. Nowadays, I think that I pay more attention to feedback from my students and since this feedback is good, I have evidence that the way I do things is a suitable one.

Without any doubt, the dream of every teacher is to have some positive impact on future lives of our students. One of the examples that proves my teaching impact is my former NLP student-Kamil with whom till present times I have been in touch. He has made a huge carrier in one of international companies dealing with AI solutions. Although he is a busy man, he still finds time to come to my students regularly to have a workshop on regular

expressions with them. Each time he starts his speech he begins: "if it hadn't been for my teacher [now my name is mentioned]…" and it means a lot to me that my former students speak highly of me. Another piece of evidence of my teaching impact could be last year elective course on metaphor as an interdisciplinary phenomenon. When I asked my students about a metaphor by means of which they would describe me as their teacher – they said that I was a bird with beautiful feathers whose singing would always attract attention but at the same time I showed them that they could fly even if they didn't have wings. Isn't it a beautiful metaphor for the role of teacher in students' life?

Now, with time and gained experience I look at teaching from a completely different perspective. First of all, the role of a teacher shifted from the major source of knowledge to the person who shapes or carves the character and attitudes of students. This change is partly justified by the fact that nowadays the access to knowledge is much easier and students are encouraged to look for necessary information on their own. The teacher's role is more that of a guide who metaphorically takes students on an exciting journey to interesting places, shows them these places and routes as well as how to get there. That is exactly how I feel about teaching- a challenge that is to be met, issues that are to be solved and finally enjoyment connected with self-development (both of me as a teacher and my students). Thus, this teacher-student relation is a bond in which both parts are mutually interdependent.

Thus, as my teaching philosophy depicts, the relationship between me as their teacher/ mentor and my students is in the centre of my teaching duty. However, nowadays when observing my students I can see that they need guidance and support in their whole academic career and my impression is that they in a way expect a helping hand from the system. Yet, bearing in mind the amount of academic and administrative duties that academic teachers nowadays have to face, I found it difficult to offer them my support to the extent they needed it. That is the reason for looking for other options of assistance from which my students could benefit. Finally, I decided to propose a peer tutoring formula

as an educational strategy for supporting students and enhancing their academic career.

4.1.2 Peer tutoring – project overview

The research question for the present article is partly focused on how peer tutoring enhances academic achievement of MA students. Then, the major assumption of the project was to help struggling students overcome the problems with the linguistic knowledge gap and, additionally, to form peer supportive relations that lasted after the finalization of the project. Another assumption of the project was the activisation of students where they started to be responsible for their own educational path and in consequence take over the role of teachers/mentors for their peers.

This Peer Tutoring Project was realized for the first time during the winter semester of 2022/2023 academic year (it continued in the winter semester of 2023/2024) at the Institute of English and American Studies at the University of Gdańsk, Poland. It was dedicated for NLP MA students without any linguistic background who undertook these studies and who, because of their non-philological experience, struggled with linguistic courses. In 2022/2023 two peer tutors, two peer tutees and a supervisor took part in the project. At the beginning peer tutors and peer tutees were trained as to their roles in the project, the goal of the project and the expected outcomes were clearly stated – the goal of the project was to help students to acquire basics connected with linguistics and the expected outcome was to pass a linguistics semester test. Peer tutors and peer tutees were given carte blanche by their supervisor as to organizing their timetable and precise didactic methods. It is also worth mentioning that peer tutors worked voluntarily for the benefit of their peer students.

4.1.3 Peer tutoring – results/questionnaires

The cooperation of peer tutors and peer tutees in the project resulted in tutees passing their semester test in linguistics. At the beginning of the project and after finalizing of the project both peer tutors and tutees filled in a questionnaire, the results of which are demonstrated below.

4.1.3.1 Peer tutors' perspective/perceptions

Preliminary questionnaires:

a. Peer tutor 1

2. What results do you expect to achieve?

I hope to be of help and support to those who need it, to make peer mentoring more common at least at the University of Gdańsk. I believe that such a project will make me feel more confident in tutoring as well.

3. What are advantages and disadvantages of taking part in such project?

The biggest advantage is the satisfaction, the feeling that I have helped someone and have actually made it easier for someone to make it through their studies. The disadvantage is the difficulty of finding the time that is convenient for both sides, and the risk that unfortunately my support and help may not be enough.

b. Peer tutor 2

2. What results do you expect to achieve?

It is my hope that the time spent mentoring a fellow student will help him succeed academically and gain a thorough understanding of the covered material. Moreover, I would like for this cooperation to result in more students taking part in the project in the future.

3. What are advantages and disadvantages of taking part in such project?

Being a part of the project will allow me to gain more teaching experience. It is also gratifying to create a support system for a peer and see them better their understanding of linguistics.

However, student mentors may become overwhelmed with having to find the time for helping a fellow student and preparing for their own studies.

Post-project questionnaires:

Peer tutor 1

2. What results did you achieve? Are you satisfied with your results?

   I believe most of the results I intended to achieve have been delivered. I think we were able to help and support the students at the beginning of their struggles, I also gained more confidence in my teaching abilities. Although I believe that with even more student involvement, even better results could be achieved.

3. What are advantages and disadvantages of taking part in such project?

   There is a great advantage in feeling that you have helped someone through similar difficulties that you had been going through yourself. It is a nice feeling to know that you are able to effectively share your knowledge. It is also a great advantage to make friends with people from the same field of study, and such acquaintance does not at all have to last only for the period of peer mentoring.

   However, such an undertaking is not without its drawbacks and possible problems. A major difficulty has been finding meeting dates that suit everyone. Even if a student found time for the meeting itself, he or she did not have it earlier to prepare for our talk. This is a difficult issue to resolve, as no one can extend the 24-hour day, but more goodwill and some sacrifice would have been welcome.

Peer tutor 2

2. What results did you achieve? Are you satisfied with your results?

I am satisfied with the results we achieved in the project, as I feel that the students have gained an understanding of linguistic notions covered during our meetings. Such cooperation created a support system in which they could ask for help with any theory they found problematic.

3. What are advantages and disadvantages of taking part in such project?

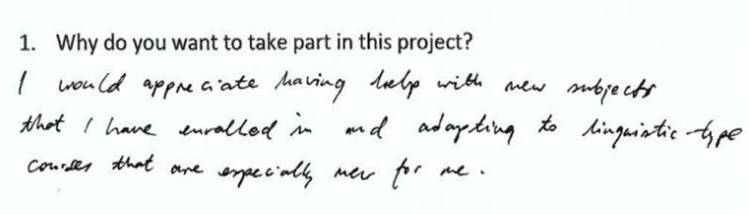
This project certainly has its advantages – I believe that the students improved their linguistic skills during the course of our meetings. Seeing them pass their exams has brought a feeling of great satisfaction. Moreover, the project created an opportunity to better my didactic abilities, as well as gain teaching experience.

The biggest disadvantage of the project is that it requires for the participants to sacrifice a lot of their time – a thing they commonly lack. Unfortunately, this resulted in the students not being properly prepared for the meetings, or not completing the tasks they were asked to do. Overall, such projects require both parties to be involved in order to be most effective.

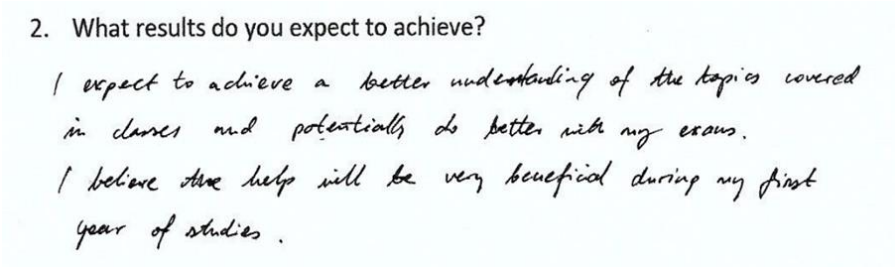
4.1.3.2 Peer tutees' perspective/perceptions

Preliminary questionnaires:

a. Tutee 1


1. Why do you want to take part in this project?

I would appreciate having help with new subjects that I have enrolled in and adapting to linguistic-type courses that are especially new for me.


2. What results do you expect to achieve?

I expect to achieve a better understanding of the topics covered in classes and potentially do better with my exams. I believe this help will be very beneficial during my first year of studies.

b. Tutee 2

1. Why do you want to take part in this project?

I decided to participate in this project because it offered help in acquiring knowledge of a subject from the Fundamentals of General Linguistics.

2. What results do you expect to achieve?

I expect to have a better understanding of the subject and related concepts.

Post-projects questionnaires:

a. Tutee 1

This participant presented the post-project reflections in the form of a short film and that is why the extracts from the questionnaires are not provided below. In short, at the beginning he presented his motivation for taking part in this project, then he moved to advantages and disadvantages of peer tutoring from the perspective of a peer tutee. As far as advantages are concerned, the most important one is the fact that his knowledge of

linguistics expanded which enabled him to pass the semester test. Also, he highlighted the role of a supervisor who had made him an offer of participation in this project and supervised the realization of the project. Yet, the disadvantage of this project was connected with the timetable since it required extra time on the part of the tutors and tutees. On the whole, he was more than satisfied with help and support that he obtained by means of participating in this project.

b. Tutee 2

2. What results did you achieve? Are you satisfied with your results?

My achievement after this project was a better understanding of the subject and passing it, so I am very satisfied with the result I achieved.

3. What are advantages and disadvantages of taking part in such project?

The advantages of participating in this project are the focus on the individual problems of the student who applied for this project, as well as the opportunity to practice a given problem until the student understands it. It can also be an advantage to participate in this project remotely and individually.

Personally, I do not see any disadvantages in connection with participation in this project.

4.1.4 Discussion

The questionnaires mentioned above reveal several prominent themes. Namely, from the initial perspective of peer tutors, the concepts of *help*, *support*, and *satisfaction* related to the development of their tutees' academic careers are particularly significant. However, difficulties and obstacles are also noted, primarily concerning *time management* and the *overwhelming with additional work*. Moreover, post-project comments highlight *satisfaction* from *helping peers* in their *academic success* as far as gaining both *knowledge* and *confidence* in their academic performance is concerned. The sole issue identified as requiring extra effort is the *sacrifice* of the tutors' own *time*.

Regarding the tutees' preliminary perspective, the recurring theme is assistance with *passing tests and exams*. This emphasis is unsurprising, as their academic progress is largely measured by grades obtained from these assessments. Post-project

reflections indicate that tutees attribute their *academic success*, specifically *passing a semester test*, to their collaboration with peer tutors. The only minor disadvantage mentioned is the additional *time involvement*. Overall, however, tutees emphasize that the benefits gained far outweigh any inconveniences encountered during the project.

Thus, the aforementioned project elucidates several challenges currently confronting higher education. One significant issue is that, regardless of the academic career level considered, students—particularly those experiencing difficulties—often feel uncertain about how to improve their academic standing. Peer tutoring projects present a valuable opportunity for both tutors and tutees. Specifically, tutors benefit from the chance to review material in preparation for their final MA exams and relations with peers from different groups. Conversely, tutees receive essential assistance in passing exams and may even find a peer mentor to aid them in addressing other academic challenges. From any perspective, the advantages gained from these peer relationships are evident.

4.2. Peer feedback project

4.2.1 Teaching Philosophy Statement of a supervisor of peer feedback project

My pedagogical objectives are to cultivate teamwork and elucidate the role of communication in IT projects. Additionally, I aim to develop students' critical thinking and design thinking skills. I am a proponent of problem-based learning and believe that collaborative efforts often yield superior solutions. Through communication exercises of incrementally increasing complexity and by fostering mutual respect among students, I strive to create a classroom environment characterized by a fervent pursuit of success. I place strong emphasis on active participation and engagement.

My optimistic and energetic demeanor is intended to inspire my students. I believe it is essential that students find enjoyment in their studies. My classes require substantial analytical

thinking and active student involvement. To maintain students engaged, I incorporate a diverse array of topics and exercises, as well as physical movement in the classroom. Students are encouraged to stand, change teams, and move around, which complements my own frequent movement during class.

By encouraging open dialogue and teaching the principles of constructive criticism, I strive to create a safe environment for students to practice communication skills. In group projects, I focus on solving problems aimed at improving people's lives, thereby fostering empathy and social awareness among students. Occasionally, I organize 'grand challenges' to encourage healthy competition. While I expect high-quality results, I also allow ample room for creativity by not requiring specific software or presentation formats.

I conclude each class with thought-provoking points, famous quotations or provocative ideas, to inspire deeper contemplation. Students also provide feedback on the most confusing aspects of the lesson, which we address in subsequent classes.

I am committed to continuous self-improvement and strive to instill this value in my students by providing them with enriching resources, such as videos and online courses, which are powerful educational tools. I also manage two mentoring programs that allow me to learn from fellow scientists and educators, helping me stay up-to-date with the latest teaching trends.

I am fortunate to work with many exceptional students at Highfliers School, which I founded three years ago. I also take great pleasure in supporting less prominent and often introverted students, who benefit immensely from the group IT projects I facilitate. It is particularly rewarding to see students, who initially doubted their ability to collaborate or speak publicly, ultimately succeed in the supportive environment of the classroom. Some team projects developed by students in my classes have even been recognized, such as at the West Pomeranian Film Festival.

4.2.2 Peer feedback – project overview

This paper explores the role of peer feedback and peer tutoring in fostering the academic success of university students. The primary objective of the Peer Feedback Project was to enhance students' teamwork and presentation skills while promoting a culture of collaborative learning and self-improvement. The initiative aimed to engage students actively in their education by encouraging them to critically evaluate their peers' work and provide constructive feedback.

The Peer Feedback Project was initiated during the summer semester of the 2022/2023 academic year at the West Pomeranian University of Technology in Szczecin, Poland and continued in the subsequent course cycle. The project specifically targeted Information Technology BSc students from diverse educational and cultural backgrounds who faced challenges in teamwork and presentation skills. During the initial cycle in 2022/2023, approximately 200 students participated in various peer feedback activities, both identifiable and anonymous. Training sessions at the start of the project outlined the roles, goals, and expected outcomes for participants. The main objective was to foster greater involvement in team tasks required to pass the course and to improve the quality of individual presentations, another course component. As anticipated, the project resulted in higher-quality submissions and more effective presentations.

The project employed two methods of peer feedback: identifiable feedback on paper was provided by assigned peer reviewers for individual student presentations, while anonymous live feedback was given online for team projects using features available on the Mentimeter platform (menti.com). It is noteworthy that while individual reviewers were randomly assigned to presenters, online peer reviewers participated voluntarily. The majority of students participated, motivated by a desire to assist their peers and enhance their evaluative skills.

4.2.3 Peer feedback – Outcomes and survey results

The collaboration in peer feedback led to significant improvements in the quality of team projects and individual presentations compared to previous student cohorts. However, the experiment did encounter some issues, particularly with anonymous feedback, which occasionally included unpleasant and unconstructive comments, an area that requires attention in the future.

Students completed surveys at the end of the term to provide feedback on the course, with specific remarks regarding peer feedback indicating that participants:

- enjoyed learning how to provide effective peer feedback and appreciated the feedback they received;
- enhanced their personal presentation abilities by learning from their peers' mistakes;
- developed better attention span and listening skills;
- built stronger peer relationships;
- actively engaged in team tasks;
- valued peer support and feedback despite the extra time required.

Some students noted additional stress associated with being reviewed by their peers rather than solely by the teacher. Interestingly, despite the presence of unpleasant comments in the anonymous feedback, students generally treated them with a degree of levity; thus, they treated identifiable feedback with more respect than the anonymous one.

4.2.4 Discussion

The surveys revealed key insights from students, who served as both reviewers and reviewees. As follows, students found value in learning to give and receive peer feedback, improved their presentation skills, enhanced their attention and listening abilities, strengthened peer relationships, actively engaged in team

tasks, and appreciated peer support despite the additional time commitment. Yet, the primary concern raised was the added stress from an extra layer of assessment. Interestingly, another fact worth mentioning is that students respected identifiable feedback more than anonymous feedback. One of the reasons for their attitude could be the issue of the quality of constructive non-anonymous comments that definitely exceeded the anonymous ones.

The Peer Feedback Project highlighted several critical aspects of higher education. To begin with, students, particularly those struggling with presentation skills, often feel uncertain about how to improve their work. Additionally, peer feedback projects offer mutual benefits: reviewers develop critical evaluation skills and gain insights into best practices, while reviewees receive the support necessary to enhance their abilities and academic performance. By utilizing both identifiable feedback on paper and anonymous online feedback, a comprehensive peer evaluation process has been established. This project demonstrates that fostering a culture of peer support and constructive criticism can significantly improve the academic environment and outcomes for all participants, despite the additional commitment required.

5. Overall conclusions

To sum up, this paper has scrutinized the essential roles of peer tutoring and peer feedback as innovative educational strategies aimed at enriching student learning and development within higher education contexts. Moreover, by providing examples of successful educational projects related to the question of either peer tutoring or peer feedback, the research question has been answered by proving that these strategies, which are firmly rooted in constructivist learning theories, are indeed effective educational strategies to be applicable in the academic environment. Moreover, these educational tools leverage social interaction and collaboration among students.

As has been mentioned above, peer tutoring serves as an effective method for bridging the gap between students' independent abilities and their potential with guidance, aligning with Vygotsky's Zone of Proximal Development. By providing structured sessions, personalized support, and ongoing feedback, peer tutoring cultivates a supportive learning environment that accommodates diverse learning needs and promotes academic independence (Wood et al. 1976; García and Cohen, 2012).

Furthermore, peer feedback, as a potent formative assessment tool, fosters metacognitive development and critical thinking skills among students. Grounded in theories of social interdependence and constructivist learning, peer feedback encourages students to engage in constructive criticism and reflective dialogue, thereby enhancing their capacity to assess and refine their own work (Nicol & Macfarlane-Dick 2006; Gielen et al. 2010).

Hence, these educational strategies facilitate not only surface learning but also deep learning, wherein students engage in meaningful inquiry, reflection, and application of knowledge. By actively participating in peer tutoring sessions and providing constructive feedback to their peers, students delve deeper into course content, develop a nuanced understanding of concepts, and internalize learning outcomes more effectively. Through these collaborative processes, students enhance their academic achievements and cultivate skills crucial for professional success.

One of the reasons for introducing peer tutoring and peer feedback into the higher education policy could be the fact that the integration of these strategies into educational practice enhances the learning experience by creating collaborative environments where students actively participate in their learning processes. Additionally, by leveraging the strengths and perspectives of their peers, students not only deepen their understanding of course material but also develop essential interpersonal skills. Furthermore, the teaching philosophies shared by the supervisors of the peer tutoring and peer feedback projects underscore a commitment to student success and holistic

development since these philosophies highlight the importance of mentorship, personalized feedback and support, and the cultivation of a culture of respect and collaboration in educational settings.

In conclusion, peer tutoring and peer feedback represent dynamic educational strategies that empower students to become active participants in their own learning journeys. By fostering supportive and engaging academic environments, these stra-tegies, along with the didactic innovations currently introduced by the authors, should significantly enhance student learning outcomes, foster critical thinking skills, and prepare students for success in their future careers. As educational landscapes continue to evolve, integrating these innovative approaches into teaching practices will play a crucial role in shaping the future of higher education.

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Towards a near-native speaker's pronunciation: The most challenging aspects of English pronunciation for Polish learners and ways of dealing with them: The suprasegmental level

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Abstract

The article[1] presents the most characteristic and recurring pronunciation problems of Polish learners of English at the suprasegmental level of the language (all aspects above the individual phoneme), which not only reveal a non-native accent, but also frequently lead to misunderstandings. Apart from presenting and discussing these problems, their possible causes are considered as well as practical solutions to minimalize their impact. Overall, Polish learners "overpronounce" i.e. they give equal stress to most words in a sentence; they do not reduce the vowels in unstressed syllables thus losing the regular rhythm of

[1] This is the third and last article in the series *Towards a Near-native like Pronunciation.* The first article dealt with problems for Polish speakers of English connected to the vowels and the second article dealt with problems connected to the consonants. See Czaja (2016; 2019)

an utterance, which is crucial for English. They also fail to link words together using the available devices (even though the Polish devices are almost identical), because of which they sound unnaturally "staccato-like". Additionally, Polish learners tend not to use sufficient elision (dropping sounds, a phenomenon which also exists in Polish) and assimilation (which, when used, is lifted from Polish and easily visible in the case of incorrect voicing – final devoicing and mid-word voicing). Word stress placement, especially with "cognates", duration of articulation and use of English articulatory settings are also problematic areas. Surprisingly, this cannot be said about intonation, which does not pose substantial problems for Poles. In the conclusion, it is suggested that making all learners of English (not only Polish ones) aware of common prosodic mistakes (L1 transfer mainly) and consistent work on dealing with them, will improve their pronunciation, thus making communication in English more effective in today's globalised world.

Keywords

suprasegmental features, reducing L1 accent, articulatory base, English voicing, connected speech

W kierunku rodowitej wymowy angielskiej: Największe wyzwania angielskiej wymowy dla Polaków i sposoby radzenia sobie z nimi: Poziom suprasegmentalny

Abstrakt

Niniejszy artykuł[2] przedstawia najbardziej charakterystyczne i najczęściej popełniane błędy przez Polaków uczących się języka angielskiego

[2] To trzeci artykuł z serii *Towards a Near-native like Pronunciation*. Pierwszy zajmował się problemami Polaków związanymi z angielskimi samogłoskami, drugi ze spółgłoskami.

na poziomie suprasegmentalnym języka (tzn. z pominięciem indywidualnych dźwięków), które to nie tylko ujawniają „nienatywny" akcent, ale często prowadza do nieporozumień. Oprócz samego przedstawienia i omówienia problemów, artykuł diagnozuje ich przyczynę oraz sugeruje praktyczne wskazówki pomagające je zminimalizować. Najogólniej mówiąc, Polacy uczący się angielskiego wymawiają „więcej niż potrzeba" tzn. akcentując większość wyrazów w zdaniu i nie redukując w słowach nieakcentowanych sylab, gubią w ten sposób regularny rytm wypowiedzi, który jest w języku angielskim kluczowy. Nie łączą też słów w wypowiedziach pomimo, iż w Polskim obowiązują niemalże te same zasady, przez co czego brzmią nienaturalnie w stylu muzycznego – "staccato". Polacy także nie pomijają naturalnie opuszczanych przez anglików dźwięków (elizja); rzadko używają asymilacji, a jeśli już, to z użyciem reguł języka polskiego, co zauważalne jest w przypadku np. błędnego ubezdźwięczniania i udźwięcznia spółgłosek na końcu i w środku wyrazu. Polacy mają też problemy z akcentem słownym, szczególnie w przypadku wyrazów pokrewnych –'cognates', z długością artykulacji dźwięków i angielskimi ustawieniami artykulacyjnymi, czego, dość zaskakująco, nie można powiedzieć o intonacji, która nie wydaje się sprawiać większych kłopotów. Podsumowując: autor sugeruje, że uświadomienie wszystkim uczącym się języka angielskiego – nie tylko Polakom – m popełnianych błędów wynikających z fonologii rodzimego języka i nieustanna praca nad ich zminimalizowaniem, poprawi ich wymowę, co w efekcie przyczyni się do skuteczniejszej komunikacji w języku angielskim w dzisiejszym zglobalizowanym świecie.

Słowa kluczowe

cechy suprasegmentalne, redukcja rodzimego akcentu, baza artykulacyjna, udźwięcznienie w języku angielskim, mowa łączona

1. Introduction

The According to Celce Murcia (1996: 10) and Peter Roach (2001: 31) the suprasegmental level of language involves all aspects of pronunciation beyond the individual phoneme, inclu-

ding rhythm, stress, intonation, pitch, loudness, tempo, duration of articulation (Catford 1992: 184), voice quality, articulatory settings and connected speech features. This article will concentrate on the most troublesome aspects of suprasegmental phonology for Polish learners of English which arguably have a substantial bearing on how they sound when speaking English.

However, before a consideration of the problematic areas of English prosody that Polish learners of English encounter, it is important to be aware of the following points: "speech is a continuum and its segmentation is an artificial procedure" (Catford 1992: 172); we hardly ever use single sounds or syllables to communicate (although there are a few e.g. *oh*, *ah*, *erm*, *sh*) rather, when we speak, we use "stretches of the continuum greater than one segment in length" i.e. groups of sounds ("clusters") or groups words ("chunks"). These segments have an impact on the pronunciation of neighbouring sounds in different ways, becoming linked and merged smoothly together ("Shandi") with the audible result of a stream of continuous sounds interrupted by pauses. Due to the Economy of Effort Principle**,** "it is a universal trait in man to cut corners also in transmitting a message" and, therefore, simplifications are normal in colloquial speech. What is crucial, however, and should be borne in mind, is the fact that they are conventional and systematic and appear in different languages in different ways (Tench 1981: 69). Thus, when words are assembled and used together with other words, they frequently undergo drastic changes in pronunciation depending on the rate of delivery and context: the most vulnerable are word endings, while those that are affected the least are the beginnings of words, which are crucial for identification. Also, it is essential to remember that the pronunciation of a word given in a dictionary is the ideal pronunciation, used when spoken slowly and clearly in isolation. In rapid colloquial speech, on the other hand, there appear many simplifications in the form of insertions, deletions, and alterations, which must be learnt, and NOT transferred from L1, if the speaker wishes to sound native like.

With reference to the above, the most challenging aspects of the suprasegmental system of English pronunciation for Polish learners of English will now be looked at. These include Rhythm, Word stress, Sentence stress, as well as Connected Speech features including Weak forms, Contractions, Linking, Elision and Assimilation. Subsequently the phenomena of duration of articulation, voice quality settings and voicing as crucial factors affecting the general sound of native English will also be considered.

2. The most usual misuses of suprasegmental features

2.1. Incorrect rhythm

Incorrect rhythm can result in a foreign accent which, due to incorrect stress placement, manifests itself in emphatic, machine gun-like, robotic speech:

1. ***What*** *are you* ***hav****ing?*
2. *I* ***hav****en't* ***seen*** *him for* ***years****.*
3. ***How*** *can she be* ***feel****ing so* ***bad*** *to****day****?*
4. *I will be* ***wait****ing for* ***you*** *at Mc****Don****ald's on* ***Fri****day,* ***Joan.***

As English has a stress-timed rhythm i.e. stressed syllables occur at roughly equal time intervals and are of equal length, in the above examples the syllables in bold will be typically accented by an English person, but the ones in ordinary print are likely to be additionally stressed by a Pole, or more likely by a Spaniard or an Italian. Since Polish is not like English in this respect, Polish learners tend to "say too much" i.e. they naturally pronounce most syllables fully thus disrupting the smooth flow of English endowing it with a "jerky" overall sound. This simply means that Polish speakers of English, just like Spanish, French and Italian speakers "don't spring from accent to accent as in a normal English utterance", in this way making their speech difficult to interpret by English speakers (Tench 1981:

77), who are not used to paying attention to every uttered syllable, but only to the stressed ones. If we look at the examples below uttered by one of the crew on a Pendolino train in Poland, we will realize how confusing and tiring the Polish version could be to an English ear.

1. *`Ladies `and `Gen`telmen*
2. *` A `paper `for `you?*
3. *`The `next `planned /* `planɛt/ *`stop `is `at I`ława*
4. *`The `sche`duled /* `ʂke`djulɛt/ *`a`rrival `time `is `six `o`clock*

It is important to point out to students that in English the length of an utterance in contrast e.g. to a French one, and to some extent Polish, does NOT depend on the number of syllables which it contains, but on the number of stressed (strong) syllables in it. The example below illustrates this situation:

1. *We* ***found*** *a* ***bike***. (4)
2. *We have* ***found*** *another* ***bike***. (7)
3. *We could have* ***found*** *another* ***bike***. (8)
4. *We ought to have* ***found*** *ourselves another* ***bike***. (12 syllables)

Learners must be made aware of the fact that each of the sentences pronounced the English way will take approximately the same amount of time, but considerably longer if the speaker is, for example, French or Polish in origin, because she/he will try to stress all or most of the syllables. Classroom practice demonstrates that speaking rhythmically is very challenging for learners of English whose mother tongue is not stress-timed, which corresponds with the findings of Chela Flores (1993 – quoted in Celce-Murcia 1996: 26) who said that "the appropriate lengthening of stressed syllables and shortening of unstressed syllable in English is the most widely experienced pronunciation challenge for speakers of other languages", no doubt inclusive of Polish speakers. Students must be constantly reminded that in

English speech rhythm is the overriding factor, to which other aspects of pronunciation are subordinated.

Generally, Polish learners of English tend to lay equal stress on most of the words in an utterance resembling more the French way, without making stressed syllables sufficiently prominent i.e. louder and longer; and without reducing the vowels in unstressed positions, thus losing the speech rhythm (based in English on equally time-spaced strong syllables and unstressed squashed syllables between them). Even though Polish learners of English will not stress every syllable in an utterance, they will tend to pronounce all syllables strongly without due vowel reduction, which slows down the tempo, disrupts the rhythm by "wobbling" the pace, and lengthens the duration of an utterance altogether.

As classroom practice shows, Polish learners of English find it hard to grasp the notion that despite the increase in the number of syllables, the number of the beats remains the same and all the above utterances, no matter how different they are in length, will take approximately the same amount of time to produce. Therefore, to keep the rhythm steady students have to be taught how to "squash" or contract the vowels (mostly to "schwa") and make other adjustments in the weak syllables (contractions, elisions) in-between the accented ones. A good way of explaining to students the nature of English rhythm is to compare it to that of a "bouncing ball", and practise it at different speeds just as speech pace can vary from phrase to phrase, or sentence to sentence (e.g. to convey moods).

In terms of practice and corrective advice, it seems that the greatest potential lies with songs, poems and chants. If students are eager to, they can try to sing them, but before that the lyrics can be chorally recited and chanted with many different emotions (e.g. sadness, anger, happiness, enthusiasm). This author's formula (Let's say it, Let's chant it, Let's sing it) to provide practice variety and to keep high motivation, works well with song lyrics, e.g. *Lucy in the Sky with Diamonds* (Beatles 1982: 129) and most of the Jazz Chants series by Carolyn Graham.

2.2. Incorrect word stress placement

Incorrect word stress placement can result in a foreign accent and confusion or misunderstanding. This is most commonly found in cognates but also in other cases:

1. cognates: *ma`nagement*, *ma`nager*, *a`rea*, *moni`toring*, *cate`gory*, *po`litics*, *te`rrorism*, *`resort*, *A`rabic*, *inte`resting*, *to im`plement*, *to`import*, *photo`graphy*, *ta`lented*, *`support*, *his`tory*, *`hotel*, *comfort`table*, *`computer*, *ac`cess*, *co`mment*, *`motel, `control*, *`result*, *`examine*, *rela`tively*, *`respect.*
2. miscellaneous: *to `hide away*, *`narrow-minded*, *`court-room*, *`town hall*, *`understand*, *`moustache*, *compe`titors*, *da`maging*, *extraordi`nary*, *re`ckon*, *cup`board*, *moun`tainous*, *tempo`rary*, *in`famous*, *pseu`donym*, *ste`reo, `develop*, *e`ffort*, *ad`vantageous.*

The words listed above belong to a group of lexical items which Polish people mispronounce in terms of stress placement. As there are virtually no difficulties with one-syllable words when pronounced in isolation as they must be stressed on that syllable e.g. *put*, *this*, *egg*, *rap*, placing the accent correctly in multi-syllable words, or compounds is more problematic. Thus it is important to learn some rules e.g. which syllable to stress when the same word can be a verb and a noun as in *to im`port*, but *an `import*, as well as which elements of phrasal verbs to accentuate when (they are) verbs or nouns e.g. to *hide `away*, but a *`hide-way.* Students must also know which elements are to be stressed more strongly in compound nouns made up of an adjective – noun or noun-noun combinations e.g. *narrow-`minded*, but *`court-`room.* This knowledge is crucial for keeping the rhythm of an English utterance flowing. However, as mentioned earlier, it must be remembered that in English speech rhythm overrides word stress, as a result of which fixed word stress patterns may change to fit in with the rhythm, e.g. *eigh`teen* but *`eighteen `women, Portu`guese* but *`Portuguese `dog*, and *con`crete*, but *`nothing `concrete to `offer.* Regarding remedial

measures, students should be informed about the general stress rule concerning words like *to in`crease*-an *`increase*, *to sub`ject*-*a `subjec*t, either as an awareness raising exercise, or in the form of casual teaching, but they should also be sensitized not to over-generalize the rule as exceptions exist e.g. *to su`pport*-*su`pport* or to *`comment- a `comment*. In other words, students must be instructed to remain alert and check the pronunciation in the dictionary of such words since stress pattern is a very important part of a word's identity.

A most surprising mistake committed by Polish learners is placement of the incorrect accent on the first syllable in the word *`computer*, which both in Polish and in English has the second syllable stressed *com`puter*, while curiously there is no problem with the word *`internet*, which in Polish has the accent on the second syllable. Also, derivatives of the word *develop* are notoriously wrongly stressed by even advanced Polish learners (also problematic for other nationalities). The Polish typical mispronunciation is *to `develop* instead of *to de`velop*, and its derivative *a de`veloper* (building contractor) in Polish is accented according to the Polish stress rules on the penultimate syllable *deve`loper*. Of course, it is crucial to practise the pronunciation of such words, not only in isolation (the citation pronunciation), but also in a broader context:

1. *The dump was so full that it had to re`fuse more `refuse.*
2. *The man decided to de`sert his de`ssert in the `desert.*
3. *I didn`t ob`ject to the `object being dumped.*
4. *Now it was the time to pre`sent the `present.*
5. *The pass was in`valid for the `invalid in question.*

It is worthwhile pointing out that classroom practice shows that there is a group of English words that Polish learners of English habitually tend to mispronounce in a predictable fashion and not only in terms of incorrect stress placement. These mispronunciations are confusing to an English ear and can even lead to a communication breakdown e.g. *alibi*, *delete*, *pseudonym*, *xerox*, or at least mark a foreign accent: *knowledge*, *mountains*,

local, *work*, *social*. It is recommended that special attention should be paid to these words and to teach or even pre-teach students their correct pronunciation as this would considerably upgrade their English. This is because most of these items are common everyday words. More examples of such vocabulary items include *photo*, *award*, *area*, *occur*, *delete*, *weren't*, *beard, basic, moustache*, *scissors*, *sword*, *comb*, *aren't*, *Baltic*, *cupboard*, *comfortable*, *work*, *mustn't*, *these*, *this*, *won't*, *iron*, *video*, *history*, *oven*, *opinion*, *author*, *cover*, *homework*, *stomach*, *effort*, *totally*, *world*, *word*, *Warsaw*, *Poland*, *certificate*, *calm*, *parents*, *saw*, *analysis, ultimate*, *focus*, *event*, *vehicle.*

2.3. Underuse of connected speech simplifications

Underuse of connected speech simplifications can result in a foreign accent due to over-pronunciation. This may lead to overformal and unnatural speech which might also sound unfriendly. As Kelly (2000: 115) has written: "English people do not notice connected speech used, but notice when it's not used".

Every language has its specific conventional ways of "taking short cuts" when pronouncing utterances rapidly in familiar contexts (Marks and Bowen 2012), and these have to be learnt if comfortable understanding is to take place: "corner cutting" rules cannot be transferred from L1, because those simplifications may not overlap in different languages. It must also be remembered that listening comprehension does not rely on hearing every sound that people articulate, but on hearing the most noticeable words or even syllables (normally content words) and reconstructing the "unheard" ones (grammar words) which might be compared to listening to and following a telegram message. Simplifications such as elision or linking make articulation easier and for this reason are common and accepted among members of every speech community (the economy of effort principle) who have no issues understanding the message without hearing clearly all the sounds of an utterance. A good illustration of how this "cutting corners" operates might be the

three pronunciation options for the two phrases in English and Polish: the slow and careful version of *What did you say*? /ˈwɒtdɪdjuːˈseɪ/, more casual /ˈwɒtdɪʤ jʊˈseɪˈ/and the rapid colloquial one /ˈwɒʤə ˈseɪ/. Similarly, in Polish *nie trzeba* 'no need' /ˈnie ˈtrzeba/,/ˈnie ˈtrze ea/, and the fastest and shortest /ˈnie trza/. As can be seen, the faster and more casually people speak, the more the citation pronunciation of words becomes reduced. With regard to students, first and foremost they need to be made aware of this process and then gradually become practised at it, which should also help with their listening comprehension.

2.3.1. Underuse of the schwa

Underuse of the schwa sound can result in a foreign accent due to over-pronunciation. This contributes to an unnatural "jerky" rhythm because of the use of full value vowels in unstressed syllables:

/e/,/a/,/o/ instead of schwa e.g. *in* ***a****ppear*, ***a****bout*, ***a****gain*, *inspect****or***, *monit****or***, *direct****or***, *soci****a****l*, *offici****a****l*, *typic****a****l*, *Lond****o****n*, *Ox****fo****rd*, *Engl****a****nd*.

One pervasive problem encountered by Poles pronouncing English is the inclination to use full value vowels in unstressed syllables instead of reducing them to schwa as in /ɛˈbaut/, /ˈbatɛ/, /ɔˈfiszal/, /ˈlɔndɔn/. In order to deal with the issue, first of all, students need to be made aware of the existence of the sound in English and its key function in the sound system. Although "tiny" – almost non-existent – the schwa vowel /ə/ is the most "powerful" and ubiquitous phoneme in the English language, which is capable of replacing any vowel or diphthong in an unstressed syllable. Being approximately every tenth or eleventh sound of English, for instance, it is the core element in the weak pronunciation of English function words, it contributes considerably to an overall English sound by being, as

already mentioned, one of the means used to keep English speech rhythmical.

2.3.2. Underuse of weak forms and vowel reduction

Underuse of weak forms and vowel reduction can result in a foreign accent because of over-pronunciation, un-rhythmical and jerky overformal speech. Therefore, it needs to be explained to students that when certain grammatical words are pronounced in isolation, they are pronounced strongly i.e. using their citation pronunciation e.g. *from* /frɒm/, *for*/fɔː/, *must* /mʌst/. However, they must remember that it is the weak forms of these words that are their usual and most frequent pronunciations. /frəm ˋjuː/, /fə ˋjuː/, /məs(t) ˋrʌn/ in regular speech.

As such a phenomenon does not occur in Polish, students find it confusing and perhaps for this reason tend to overuse the strong forms which they find in the dictionary first, thinking that they are the most important pronunciations to learn. Hence, it is very important for them to remember that English function/grammar words e.g. *must*, *from*, *have*, *her,* are NOT usually stressed in an utterance and consequently become weakened in pronunciation to /məs(t)/,/frəm/,/(h)əv/,/(h)ə/, of which they tend not to be aware and pronounce them strongly as /mʌst/,/frɒm/, /hæv/, /hɜː/ instead. This, unfortunately, makes them sound unnatural and rather "artificial", therefore it appears to be of utmost significance to make students aware of this and help them master the production and application of this "magic" sound, which is so crucial to the English overall sound. Following Adrian Underhill's advice (2019), an effective way of explaining of how this /e/-ish sound is made is to employ humour: an "idiot's face", muscles relaxed; tongue behind bottom teeth, slightly raised, but not touching them; lips cornered, spread and slightly opened in a resting pre-speaking position. Students need to be made aware of the fact that anybody beginning to learn English is accompanied by the schwa from the very start, most likely without realising it, e.g. in the indefinite articles before single one-syllable nouns e.g. ***a*** car, ***a*** desk, ***an*** oak,

a*n* owl, so it is not a completely "alien" sound. Later in multi-syllable words it is the same shwa vowel that tends to occur in most of the unstressesd syllables e.g. two syllables: *a cupboard* /**ə** `kʌbəd/ instead of /`kap`bɔrt/, *a lemon*, /**ə**`leməո instead /ɛ `lɛmɔn/; three syllables*: an `elephant* /**ə**n `eləfənt/ instead of /ɛn ɛ`lɛ`fant/, *a material* /**ə** mə`tɪəriəl/ instead of /ɛ ma`tɛrial/; four syllables: *comfortable* /`kʌmft(**ə**)bəl/, instead of /`kamfər`tɛjbul/, *a philosopher* /**ə** fɪ`lɒsəfə/ instead of /ɛ `filɔ`zɔfɛ/.

Schwa /ə/ is present in longer stretches of natural speech and also underused by Poles. Because of this, they are more inclined to employ strong pronunciations, thus sounding emphatic and overformal by pronouncing e.g. *What are you doing*? as /`wɒtɑ: ju: `du:ɪŋ/ instead of/`wɒtə jə `du:ɪŋ/ or *Where are you going*? as /`weəɑ: ju:`gəʊɪŋ/ instead of /`weə(r)ə jə `gəʊɪŋ/. In this instance, it may help if students are made aware of the fact that in Polish a form of schwa does exist, but that it is not a key element (Wierzchowska 134) of the sound inventory. It is used sporadically when pronouncing polysyllabic words quickly e.g. *na uniwers**y**tecie* 'at university', *prez**y**dent* 'president', *amer**y**kański* 'American' and this might be one of the reasons why Polish learners do not use it extensively, with most being completely unaware of its existence.

2.3.3. Underuse of contractions

Underuse of contractions leads to unnatural, staccato speech, and possibly a loss of rhythm and flow which may result in a foreign accent. Contracted forms occur in English but do not occur in Polish:

1. Contracted forms in English, e.g. *shouldn't*, *can't*, *mustn't*, *you'll*, *he's*, *hasn't*, *there'll*, *it'd*, *aren't*.
2. These contracted forms DO NOT occur in Polish (*`nie-**m**a`* /*`nie-a/*, *`nie-**s**ą`* /*nie-ą/*, *`nie-**mo**że`/nie-ože/*; *'hasn't'*, *'aren't'*, *'can't'* respectively).

For the majority of Polish learners, contractions i.e. noun/personal pronoun+auxiliary verb, auxiliary verb + negation or a combination of the three, also seem an odd aspect of English pronunciation. They have no counterpart in Polish and quite possibly for this reason Polish learners tend not to favour them greatly with the effect of an artificial and unnatural staccato-like sound, due to pronouncing "too much". Generally, learners are surprised that words – in this case grammatical words – can be joined together to obtain "new" and previously unkown results, e.g. *we will* becomes *we'll* and can be pronounced as /ˋwi:l/ or /ˋwɪl/ a homophone to *will*, *it had/would* becomes *it'd* and must be pronounced as /ˋɪtəd/ with an extra schwa to make it pronounceable. In the same vein, *are not* becomes *aren't* /ˋɑ:nt/, not /ˋarɛnt/ as many Polish students prefer to say it, just to make it different from aunt /ˋɑ:nt/, which I call a 'mental block against homophones', hardly or non-existent in Polish. Furthermore, *They are* can be surprisingly pronounced as *they're* /ˋðeɪə/, or as *there* and *their*/ˋð(e)ə/, *it is not* can become *it's not* /ɪts ˋnɒt/ or *it isn't*/ɪt ˋɪznt/, *there will not* can be pronounced as *there won't* /ð(e)ə ˋwəʊnt/ or *there'll not* /ð(e)əl nɒt/. Hence, learners should repeatedly be reminded about homophones, to become familiarized with the phenomenon in order not to panic or feel surprised when they have to pronounce words identically even though they have different spellings and meanings (e.g. *war/wore*; *write/right/rite*; *rode/road*).

2.3.4. Underuse of linking: plain linking and insertion of /j, w, r/

Underuse of linking, such as plain linking and insertion of /j, w, r/, can result in a foreign accent because of overformal, staccato/jerky speech. And, while most of these features do exist in Polish, students still need to be reminded of them when they speak English. With regard to rapid colloquial speech, it must be kept in mind that the dictionary pronunciation of words can change; this especially concerns the final syllable, which is impacted by the initial sound of the word that follows. As words

become linked, word boundaries move and in effect in rapid speech they may sound like completely different words e.g. in the phrase *in America and Russia,* an intrusive "r", plain linking and elision appear /ɪ **nə**ˋmerɪkə **r**ən(d) ˋrʌʃɪə/ and in careful slow speech /ɪn əˋmerɪkə ənd ˋrʌʃɪə/; the sentence *They are Egyptian* Polish learners are most likely to pronounce /ˋðeɪ ˋɑ: ɪˋdʒɪpʃən/ instead of /ˋðeɪ ə ɪˋdʒɪpʃən/ with the weak form of "are", or most naturally /ˋð(e)ə **r**ɪˋdʒɪpʃən/ with the contracted form of '*they are*' and a linking "r". In contexts such as *on the (j) early train*, *hard to (w) answer*, the linking "j" and linking "w" are often used when in fast casual speech, which may prove confusing –*yearly train*?; *to one sir*?; if students are not aware of the linking phenomenon. It should be pointed out that luckily for Polish learners, Polish phonology also has most of these linking devices i.e. "w" and "j" e.g. *u Ewy i Adama* /u**w**evɨ i**j**adama/ 'at Eve and Adam's' the only exception being the intrusive "r". As remarked above, we also have plain linking in Polish, which works in exactly the same way, but being native speakers we are not aware of it e.g. *przed Elą*, 'in front of Ela', *bez Uli* 'without Ula'; *koszmar Agaty* 'Agatha's nightmare' (linking "r" can be treated as plain linking). Hence, one might say the students should not be afraid or overwhelmed when confronted with the phenomenon, but practise extensively to become more fluent speakers. It is important to sensitize students to the fact that linking is NOT something "English unique" and that the Polish linking devices except for the intrusive "r" are the same. The English linking devices are easy to remember by learning the five phrases which illustrate the English linking system below:

1. *O**ne** **e**gg* plain linking: (final consonant of first word moves on and becomes the first letter of the second word)
2. *T**wo** **e**gg**s*** linking "w": (extra "w" is inserted to begin the second word)
3. *Th**ree** **e**gg**s*** linking "j": (extra "j" is inserted to begin the second word)
4. *Fou**r** **e**gg**s*** linking "r": (final letter "r" is pronounced as start of the second word)

5. *Ra**w** **e**ggs* intrusive “r”: (extra “r” is inserted to begin the second word)

a) Plain linking
1. *Adam love**s** **Anna** Ojcie**c** **Arka*** ‘Arek’s father’
2. *Susan know**s** **Oliver** Jace**k** **emigruje*** ‘Jack’s emigrating’

b) Linking “w” after /u/ and /u:/
1. *Nothing t**o**/w/**ea**t St**u**/w/**A**rabów* ‘one hundred Arabs’
2. *Do y**ou**/w/**u**nderstand Dwust**u**/w/**E**gipcjan* ‘two hundred Egyptians’

c) Linking “j” after /i:/ and /ɪ/
1. *It`s s**o**/w/**ea**sy U Ewy/**j**/**E**dwarda* ‘at Eve and Edward’s’

d) Linking “r” (like ‘plain linking’)
1. *Neve**r** **e**nding story Dyrekto**r** **a**rtystyczny* ‘Arts Director’
2. *Late**r** **o**n Mento**r** **E**wy* ‘Eve’s mentor’

e) Intrusive “r” (no intrusive “r” in Polish)
1. *The ide**a**/r/**o**f Ide**a**/r/**o**brony* ‘the idea of defence’
2. *L**aw**/r/**e**nforcement drzew**o**/r/**A**dama* ‘Adam’s tree’
3. *Dram**a**/r/**a**nd comedy baz**a**/r/**i**rańska* ‘Iranian base’

As can be seen from the above examples, it is only the intrusive “r” that Polish phonology does not take advantage of and this students should be reminded of when having to deal with linking in English**.**

2.3.5. Underuse of elision

Elision i.e. the dropping of sounds or even whole syllables to keep the rhythm and ensure comfortable and smooth speech flow, is a very important and common aspect of connected speech which occurs in most languages extensively due to the economy of effort principle, following their L1 specific rules. Underuse of elision can result in over-pronunciation, a disrupted

flow and rhythm of speech, as well as a staccato effect. It may also lead to an overformal sound and an impression of anger or irritation on behalf of the receiver. In English and Polish it is usually the consonants (especially stops) that become deleted as the main disruptors to smooth speech flow, but vowels and unstressed syllables are also vulnerable to the process:

1. Consonants: *gran**d**father*, *clim**b**ing*, *as**k**ed*, *exac**t**ly*, *a**l**ready*, *a**l**so*, *tell **h**im*, *I don`**t** go*, *Marti**n** knows, sto**p** talking, effec**t**s.*
2. Vowels: *s**u**`ppose, `fact**o**ry, s**u**`pport.*
3. Syllables longer than one vowel: *`temp**o**r**a**ry, `lit**e**r**a**ry, ex`tr**ao**rdin**a**ry.*

Close analysis of the sentence *It can't be done* /ɪt `kɑ:nt bi:`dʌn/, /ɪ(t) `kɑ:n(t) bi`dʌn/, /ɪ(t) `kɑ:m bɪ`dʌn/ can give an idea of how elision works. It can be noticed that in the faster version, the two "t"s are likely to be dropped and the /i:/ in "be" would be weakened to /i/ and further reduced to /ɪ/. Lastly the remaining "n" in ` /kɑ:n/ might change to "m" as a result of anticipatory assimilation taking place, because of the following bilabial sound /b/ (to be discussed later). When we examine the examples from English and Polish provided below, we will realize that the phenomenon is extremely common in rapid colloquial speech in both languages, but not identical, and therefore students need to be made aware of this fact, and then consistently reminded and encouraged to study and apply elision more regularly to achieve a natural smooth flow of speech similar to that they have in Polish. It must be pointed out that the Polish examples below are not an exhaustive list of possible elision contexts in Polish, but have been provided to illustrate the degree to which they overlap with English elision rules.

I. Typically elided consonants:

a) English

1. *cu**p**board*, *dou**b**t*, *frien**d**s*, *bran**d**-new*,

2. *min**d** the gap*, *you mus**t** do it*, *I don'**t** know*,
3. *tell **h**im/**h**er to stay*,
4. *a**l**ways*, *a**ll** right*,
5. ***th**ank you*, *fif**th**s*.

b) Polish
1. *wszys**t**ko* 'everything', *napas**t**nik* 'forward', *uczes**t**nik* 'participant',
2. *g**ł**upi* 'stupid', *jab**ł**ko* 'apple', *pomys**ł*** 'idea**'**, *poszed**ł*** 'went',
3. *do gar**n**ka* 'into the pot', *ziar**n**ko* 'a grain',
4. *ci**ch**o* 'quiet' *Zby**ch**u* (male name), *s**ł**u**ch**am* 'I'm listening',
5. *zo**b**acz* 'look', *trze**b**a* 'ought to', *o**cz**ywiści* 'of course',
6. *jes**t** dobrze* 'it's all right', *po**d** domem* 'outside the house', *gró**b** brata* 'brother's grave',
   *nie ko**p** piłki* 'don't kick the ball', *mo**ż**na i tak* 'this is fine, too'.

II. Identical neighbouring consonants – gemination (overlap except for 7 and 8 where both sounds have to be articulated as well as their combinations in 9 and 10)

a) English
1. *Gle**n kn**ocks*, 2. *as**k Ch**ris*, 3. *fil**m M**ichael*, 4. *sto**p p**ushing*, 5. *don`**t t**alk* except for 6. *flo**g G**ary*, 7. *Fren**ch ch**eese*, 8. *bri**dge j**argon*, (9. *ri**ch j**udge*, 10. *villa**ge ch**urch*).

b) Polish
1. *sy**n N**owaka* 'Nowak`s son' 2. *ro**k K**asi* 'Kate's year' 3. *Ada**m m**arzy* 'Adam's dreaming' 4. *skle**p P**iotra* 'Peter's shop', 5. *bra**t t**aty* 'father's brother', 6. wró**g G**rażyny 'Grażyna's enemy', 7. *wal**cz cz**asem* 'fight sometimes', 8. *zmiaż**dż dż**unglę* 'smash the jungle', (9. *pożyczz dżemu* 'lend me some jam', 10. gwiż***dż cz**ęsto* 'whistle often').

III. Elision – plosives (p, b, t, d, k, g) followed by any consonant (overlap)

a) English
1. *don'**t** **l**augh,* 2. *spen**d** **m**oney*, 3. *Ro**b** **V**incent*, 4. *sou**p** **r**ecipe*, 5. *pu**b** **n**ame*, 6. *bi**g** **s**tart*, 7. *las**t** **m**inute*.

b) Polish
1. *Świa**t** **L**ucyny* 'Lucy's world', 2. *na**d** **m**orzem* 'by the sea', 3. *zą**b** **W**ojtka* 'Wojtek's tooth', 4. *ko**p** **r**ów* 'dig a ditch', 5. *nie ró**b** **n**iczego* 'do nothing', 6. *wró**g** **S**ławka* 'Sławek's enemy', *7. lo**t** **m**otyla* 'a butterfly's flight'.

IV. Elision – vowels (syllables) (exists)

a) English
1. *p**e**r**h**aps*, 2. *p**a**r**t**icular*, 3. *monit**o**ring*, 4. *int**e**rested*, 5. *com**f**or**t**a**b**le,* 6. ***e**xcuse me*, 7. *lit**era**ry*, 8. *hist**o**ry*.

b) Polish
i) 1. *kons**ty**tucja* 'constitution', 2. *am**e**rykański* 'American', 3 . *uniwers**y**tet* 'university', 4. *ob**yw**atel* 'citizen', 5. *ko**a**licja* 'coalition', 6. *trze**b**a* 'ought to', 7. *ocz**y**wiście* 'of course' (recently an "irritating" TV phenomenon).
ii) 1. *p**ro**szę bardzo* 'here you are', 2. ***dzię**kuję* 'thank you', 3. ***prze**praszam* 'excuse me', 4. *d**o** w**i**dzenia* 'goodbye', 5. ***dzień** dobry* 'good day', 6. ***do**branoc* 'good night', 7. ***g**dzie/j/**i**dziesz* 'where are you going'.

As shown above, the process of elision in rapid colloquial speech is very common and widespread in both languages, however, not identical. In both languages, it pertains to consonants, vowels and whole syllables and is very active in everyday high-frequency words. It must also be stressed that in both languages the word boundary adjacent /ʤ/, /ʧ/ cannot be dropped and must be fully articulated to avoid confusion. It is interesting to note that elision is a marker of accent in Britain: while lower

classes tend to drop consonants, upper classes omit vowels (Fox 2004: 74).

2.3.6. Underuse of correct assimilation

Underuse of correct assimilation can result in a foreign accent because of over-pronunciation, e.g. a formal, unnatural sound in colloquial speech (caused by L1 phonological rules, mostly different from English).

2.3.6.1. Assimilation of place

1. Anticipatory assimilation in English

   a) *goo(d)**bb**ye to Jane*, *goo(d)**bm**orning*, *han(d)**mb**ag*, *whi(t)e**kCh**ristmas*, *whi(t)e**pm**oss*, *tha(t)**kg**irl*, *te(n)**ŋ g**irls*, *gree(n)***mp**en, *strong* /ˈ**ʃtr**ɔŋ/.

2. Coalescent assimilation in English (two neighbouring sounds produce a new sound)

   a) *You **tu**be-*/ˈju:**ʧju**:b/, *s**tu**dent* /ˈ**stʧju:**dənt/, *woul**dy**ou* /ˈwʊ**ʤj**u:/or /ˈwʊ**ʤə**/ *can**ˈt y**ou* /ˈka:n**tʧj**u:/ or /ˈka:n**tʃə**/ *issue* /ˈɪʃju:/, as you know /ˈæʒju: ˈnəʊ/.

   b) *What are you going to do?*/ˈwɒt ə jə ˈgəʊɪŋ t ə ˈdu:/ ˈwɒʧjə gonə ˈdu:/; *Look, what you are doing!* /ˈlʊk ˈwɒʃ(j)əˈdu:ɪŋ/.

Although assimilation of consonants is generally viewed by phoneticians as an optional feature to master since it results in "sloppy" speech, receptive knowledge of the phenomenon is regarded as very important for understanding rapid casual speech. According to Tench (1981) it "may not be a must for active use, but once used, we begin to notice it better and our listening comprehension improves". Assimilation can be described as the most advanced way of simplifying speech used by native speakers after the application of elision, and appears

most challenging for English learners. For example, in the word *handbag* the /d/ is dropped first and then /n/ is changed to /m/ in anticipation of the following bilabial consonant /b/ thus yielding /ˋhæmbæg/, which is considerably easier to say than /ˋhændbæg/ in terms of articulator movement economy. To put it simply, we do not pronounce the sounds that we should by following the citation pronunciations, but create an auditory illusion of doing so by retaining most of the final sound features i.e. the voicing and manner of articulation, but only changing the place of articulation thus economizing on the tongue movements to do the work that is needed. It is all about making minimal effort to convey a message in familiar context by making maximum word reduction and sound change, as well as the amount of energy used to produce recognizable words and utterance and thus a comprehensible message to somebody who knows the simplified system. Apparently more change is allowed when there is not a word in the lexical repertoire with which the altered, simplified version can be confused and this might be the reason why considerable or complete devoicing in word final position happens (to be discussed later).

Looking at the three kinds of assimilation in English i.e. Assimilation of Place, Assimilation of Manner (rare) and Assimilation of Voice, it seems that the most commonly applied type by English people is the Assimilation of Place, which on the other hand, does not happen to be so popular with Polish learners of English even though it appears to occur in Polish in some consonantal contexts. As was stated earlier, by minimizing the amount of tongue movement needed to produce the exact sounds, "similar" sounds are produced, in which features of contrast are kept i.e. the voicing, and the manner of articulation. What changes is the place of articulation, which becomes that of the consonant that follows in the word or across the word boundary. As far as Polish students of English are concerned, they do not seem to have problems with using coalescent assimilation, which interestingly does not exist in Polish, but makes their English accent more natural.

3. Assimilation of Place (coalescent – two neighbouring consonants produce a new sound) a comparison of English and Polish

The English assimilation contexts do not apply in Polish, and what is interesting Polish learners do not have problems producing them and using them quite extensively, most frequently type 2 and 3 shown below:

1. *I`ll lo**se** **y**ou* /z+j=/ʒ/ *be**z** **J**ana (-)* 'without John'
2. *I nee**d** **y**ou* /d+j=/ʤ/ *błą**d** **J**oli(-)* 'Jola's mistake'
3. *I go**t** **y**ou!* /t+j=/ʧ/ *ko**t** **J**urka(-)* 'George's cat'
4. *I mi**ss** **y**ou* /s+j=/ʃ/ *la**s** **j**agód(-)* 'wood of blueberries'

As was mentioned above, Polish learners have greater problems with Anticipatory assimilation and do not use it so commonly even though it appears to be partially present in Polish. The examples show the different English assimilation contexts and their possible Polish counterparts, followed by my **personal** native speaker`s judgements of whether they exist or not:

1. *Gree**n** **P**arty – sy**n** **P**iotra* (+); *re**d** **p**epper – po**d** **p**ozorem (-)*, /n/ changes to /m/ and /d/ to /b/
2. *wh**ite** **c**offee – ko**t** **K**amila (-*?); *re**d** **g**old – na**d** **g**łową (+)*, /t/ changes to /k/ and /d/ to /g/
3. *righ**t** **m**agic – lo**t** **m**akabra (+)*; *te**n** **g**irls – se**n** **G**abrysi (+)*, /t/ changes to /p/ and /n/ to /ŋ/
4. *te**n** **b**oys – pla**n** **b**udżetu (+)*; *goo**db**ye – po**d** **B**ogiem (+*?), /n/ changes to /m/ and /d/ to /b/

Interestingly, looking at the assimilation problem from the perspective of Polish phonological rules, the typical Polish assimilations listed below seem to exist in English too, but in Polish in some of the examples L1 induced regressive devoicing occurs:

1. ***z** **cz**osnkiem*/sʧ/ becomes /s͡ʧ/ 'with garlic' *The**se** **ch**eries*/zʧ/ becomes /ʒʧ/

2. ***z dże****mem* /zd͡ʐ/ becomes /żd͡ʐ/ 'with jam' *It wa****s G****eorge!*/zʤ/ becomes /ʒʤ/
3. ***z sze****fem*/sʂ/ becomes /ʂʂ/ 'with a boss' *The****se sh****orts* /zʃ/ becomes /ʒʃ/
4. *ro****zż****arzyć* /zʐ/ becomes /ʐʐ/ 'heat sth up' *It wa****s J****acque*! /zʒ/ becomes /ʒʒ/

As classroom practice shows the most troublesome kind of assimilation for Polish learners of English is the assimilation of voice where clearly Polish phonological rules tend to be applied unconsciously. The result of this is an L2 accent characterised by a generally "muffled" and "hissy" sound, interspersed with frequent unexpected voicing caused by the Polish rule of voice agreement in consonant clusters. In English phonology voiced and voiceless consonants can stand side by side without assimilating to each other, which is very difficult for Polish learners to remember and apply. This phenomenon was described in detail in a previous article on the English consonants (Czaja 2019).

2.4. Duration of articulation, incorrect phoneme length, reduction and extension

Duration of articulation, incorrect phoneme length, and reduction and extension, can result in a foreign accent as well as confusion because of a failure to keep the English rhythmic flow of speech – the 'Morse Code-like' delivery that gives English its particular character. One of the most challenging problems that a Polish learner encounters while studying English is the varied length of English vowels, which they have to master to speak English appropriately. As we know the Polish vowels (/a/, /u/, /ɛ/, /ɔ/, /i/, /ɨ/) are all short and lax, and although we can make them longer e.g. when hesitating or screaming out a word in excitement, this does not entail a change in the meaning of a word, which however, can be different in English e.g. *polka* /ˋpɔlka/ 'female Pole' and /ˋpoɔɔɔlka/, but *a pot* and *a port* (although the quality remains different with native speakers). The Polish learner who has little experience of having to distinguish

between long vowels marked in phonemic transcription with /:/ and short ones, experiences difficulties producing them correctly, especially the ones containing long and tense vowels such as /ɔ:/, /u:/ or /i:/ /ɑ:/, or those containing diphthongs i.e. combinations of two vowels, for instance: /aɪ/, /ʊə/, /əʊ/ (quality-wise in closing diphthongs /eɪ /,/ aɪ /,/ ɔɪ/ where the Polish sound /j/ is often used instead of /ɪ/, and /w/ instead /ʊ/ in the backing ones /ɔʊ /, / aʊ / by most Poles, which gives it a slight sound of a Polish accent. In order to pronounce them correctly, the learner must be made aware of the fact that the first element in each diphthong is at least of double length and slightly louder than the second one if he desires to sound natural e.g. *hi* /ˋhaaɪ/, *bye* /ˋbaaɪ/ (not the Japanese way /ˋhaj /, /ˋbaj/). It should be remembered that the second segment /ɪ/ must not, on any account, be substituted with the Polish sound /j/ in the preceding examples or with /ɬ/=/w/ in e.g. *now*, *cow* to sound /ˋnaw/ and /ˋkaw/ the Polish way. From the very start, Polish learners must be familiarized with the fact that English short vowels are extremely short and the long ones genuinely long; the longer the better, especially in open syllables or the ones ending in a voiced consonant.

In addition, there are further possible complications with regard to vowel length related to the context in which they occur and this refers to both long and short vowel sounds. In English, there are at least two, or according to some phoneticians, three possible vowel durations, depending on the context in which they are found: a) the longest variant is found in open syllables e.g. in the verb *to see* /ˋsi::/ b) a similar variant or slightly shorter may be found in closed syllables by a voiced consonant e.g. *seed* /ˋsi::d/ and c) the shortest possibility when syllables are closed with a voiceless consonant e.g. *seat* /ˋsi:t/.[3] Of course, in the dictionary in all the three words you will find only

[3] When a vowel comes before a voiceless consonant, it is typically said for the shortest duration. When a vowel comes before a voiced consonant, it is said a little longer. And when a vowel comes at the end of a syllable, also called an open syllable, the vowel is said for the longest duration. (e.g. American English accent – San Diego)

two dots indicating prolonged length without any trace of the nuances i.e. /ˋsi:/, /ˋsi:d/, /ˋsi:t/, but the above secret knowledge proves useful if one wishes to sound correct and be easily understood. With English short vowels, the situation is similar, but since they do not occur in open syllables, there are only two lengths in use depending on whether the syllable ends in a voiced or voiceless consonant e.g. *wig* /ˋwɪ:g/ and *wick* /ˋwɪk/. Likewise, in the dictionary the pronunciation of both words contains only the symbol /ɪ/with no indication of length difference, so learners must know when it is pronounced longer. It has to be explained to students that phonetic symbols with two sets of dots do not "officially" exist and that they have only been made up to illustrate the differences in length between the particular contexts.

As regards the diphthong, the rules are the same i.e. in *loud* the /aʊ/ is pronounced longer, because of the following "d" than in *lout*, where the /aʊ/ is considerably shorter, because of the voiceless consonant "t" that closes the syllable. In other words: students must be informed that a syllable final voiceless consonant reduces the length of the vowel before, and a voiced one prolongs it. Summing up, students must be taught these nuances of length as they are crucial for speaking and understanding English comfortably. Unsurprisingly, this is rather confusing for Polish learners, even if occasionally a similar phenomenon may be met in Polish, but not to such an extent e.g. 1. *ko* 2. *kod* 3. *kot* 1. 'sound made by a hen', 2. 'code', 3. 'cat' respectively-though 2 and 3 are likely to become homophones and be pronounced as /ˋkɔt/. Accordingly, students must be reminded continuously that long vowels in English are extremely long i.e. as if they were sung, particularly the ones in open syllables as in the word *rye*, and those closed with a voiced consonant e.g. *ride*, and very short in syllables closed with a voiceless consonant e.g. *right*. Looking at the two words mentioned above – *right* and *ride* – we notice that both of them contain three phonemes, therefore it could be assumed that the overall duration of articulation is approximately identical. However, there is a difference in the distribution of length of their particular components i.e.

right /r/=1, /aɪ/=1, /t/=2 and *ride* /r/=1, /aɪ/=2, /d/=1. In the first word the longest phoneme is the final aspirated fortis /t/, in the second, it is the diphthong /aɪ/ lengthened before the voiced lenis consonant /d/, while both containing four units of length. The same could be said about pairs of words such as *pick* and *pig*, *bus* and *buzz* or *search* and *surge*.

It must be remembered that in English, which is traditionally classified as a stress-timed language, the "long" vowels in stressed syllables are often prolonged and short ones are reduced to synchronise with the beats of the sentence rhythm. Generally, it is not difficult to notice that the English vowels made by Polish learners tend to be shorter, probably because of L1 influence and Polish learners should be sensitized to the problem as early on as possible and practise it continuously. In brief: they should be taught that the long vowels should be "stretched" and "sung away" while the short ones (before voiceless consonants) clipped short. Students should also make every effort not to devoice completely final voiced obstruents, which automatically reduces the length of the preceding vowel, thus causing potential misunderstandings and contributing substantially to our Polish "hissy sound".

2.5. Voice quality settings

According to Celce–Murcia (1996: 10) except for an inventory of phonemes and characteristic stress and pitch pattern "every language has certain audible characteristics that are present most of the time when native speakers talk" (Abercrombie 1967: 91). Laver (1980) calls it voice quality, which includes features such as phonation, loudness, pitch level, muscular tension, sub-laryngeal settings: position of the tongue, lips or presence of e.g. nasality.

2.5.1. Dentalisation and fronting

Using the Polish articulatory setting results in a foreign accent. If we look at the list of the most frequently used English conso-

nants, we immediately realise that most of them are those which are made with the tip of the tongue touching the teeth ridge and near that area. These consonants i.e. /n/, /t/, /d/, /s/, /z/, /l/, of highest frequency in English, which in Polish are dental except /l/ (most phoneticians accept this apart from Reszkiewicz 1981: 90, and I tend to agree with him), demonstrate that the Polish tongue's position is generally lower in the mouth. It is also more frontal than the English tongue position, which is somewhat curled up and retracted facing or hitting the teeth ridge in its speaking position. This position of the tongue assumed for the production of the alveolar consonants with its sides pressed against the upper teeth, happens to be approximately the same for the making of the most frequent English vowel- the omnipresent schwa 10,74 % followed by /ɪ/ 8,33 % /e/ 2,97 %, and /aɪ/ 1,83 % (Gimson and Cruttenden 1994: 136). Hence, it can be concluded that this position of the tongue assumed for easy production of the mentioned sounds together with the corners of the lips pulled in, and slightly open jaw generally make up the English articulatory setting (Honikman 1964: 76) or Articulatory Base as it is sometimes referred to. This is the pivotal, routine departure point, for making all the sounds of English and blending them into words and those into phrases, which guarantees a smooth and comfortable production of speech with all its natural reductions and simplifications. Since the Polish articulatory settings are different, Polish learners tend to feel discomfort or even a slight pain after speaking English intensively for a long time (Ozga 1977: 125–126). Not having to speak English continuously, we are not comfortable with our vocal tract muscles contracting and expanding differently for Polish. As we grow up speaking L1, our muscles only stretch to the extent the production of L1 sounds requires, but this degree varies from language to language and for that reason new L2 muscle stretching habits must be made including the sub-laryngeal area. A visible sign of using facial muscles for speaking a language might be the different shape of facial lines developed over time on the faces of native speakers, (Honikman 1964: 74) especially from the corners of the lips down to the

chin. Having used intensively particular muscles over the formative years and thus becoming accustomed to the Polish range of movements, we are bound to feel discomfort when we speak English for a long time with English articulatory settings. Therefore, if we wish to attain a native like accent we need to go into "English gear" and practise the new muscle settings extensively. Similarly, foreigners speaking Polish with their L1 articulatory settings will inevitably sound foreign to us and most likely also feel facial discomfort. As Honikman (1964: 74) said **it is not possible to speak English appropriately without adopting English articulatory settings.** Hence, if we hold on to the Polish articulatory setting ("Polish gear"), we will not produce English speech flawlessly; there will always be a foreign accent. To conclude, the English overall sound is alveolar ridge "scented" and students need to be made aware of it and practise it at all times. It must also be kept in mind that every language has its own unique articulatory base or setting, which is decided upon by the most frequently occurring sounds and sound combinations in that language, both vowels and consonants. It is these very segments that determine the neutral, most comfortable position of the mobile articulators (the tongue, lips, jaw) in relation to the immobile ones (hard palate, teeth, soft palate) for the production of fluent and economic speech. These most frequently produced segments give a particular language its overall characteristic "colouring" that is present in all utterances of a particular language. A very simple but effective way of making students become aware of the differences in articulatory settings between Polish and English is to ask them to read aloud the pairs of words shown below, first correctly and then the English words with Polish sounds and the Polish words with English sounds:

1. *ten* 'this'/*ten*
2. *test*/*test*
3. *list* 'letter'/*list*
4. *set*/*set*
5. *limit*/*limit*

6. *tak* 'yes'/*tuck*
7. *tenis*/*tennis*
8. *data* 'date'/*data*
9. *ZUS* 'Social Insurance Institution'/*Zeus*
10. *to tu* 'it`s here'/*tattoo*

As soon as they realize the differences and also how frequently alveolar consonants are employed in English phonology, they will understand the key importance of these sounds in English for its overall sound. Hence, students need to be made aware of the fact that the alveolar ridge place of articulation is the most common and frequently used point of contact between articulators in English. It gives English its characteristic sound and therefore it is indispensable to use if one wants to develop a near native speaker accent. An experiment by Ozga (1977: 127; Święciński 2004: 149) proved that instruction and practice given to students to learn English articulatory settings improved their English pronunciation considerably. Students must know that English native pronunciation is imbued with alveolarization and, for this very reason, it is of the utmost significance to familiarize students with the notion of the articulatory setting for English as the prerequisite of being able to attain a native like sound. It could be compared to the foundations of a house, upon which the remaining elements will be built.

As mentioned previously, the sound system (statistics/frequency of sounds) of a language has a decisive influence on the articulatory setting (Ozga 1976: 67), (Dudkiewicz 1995: 91). Delattre (1969: 2) says "English typically centers its articulation around the neutral vowel /schwa/, thus jaws are loosely closed at most about a finger`s width". I have also observed that in English the jaw movement seems to be more horizontal; the extreme points being lips pulled in and spread for /i:/, and lips pushed out, pursed and rounded for /u:/. The neutral lip position is slightly more open and less spread than for /i:/, a little more forward, open as for /e/ and its extreme horizontal position is as that as of the half-closed rounded /ɔ:/. Moreover, the movements of the jaw in Polish are more extensive and energetic

vertically. Because the degree of mouth opening depends on the predominant vowels, in Polish it is more open as the most frequent vowels are open /e/, /a/, /ɔ/ (Święciński 2004: 146), while in English closed and half closed /ɪ/, /ə/ and /e/. In practical terms, this means that when English people speak the tongue is rarely visible, but the movement forward of the jaw for /ɔ:/ and /u:/ is more noticeable when looked from the side. As different jaw muscles are used habitually in different languages (muscular habits), it is visible in the different shape of the lines of on their faces, especially below the lip corners (from the sides of the nose to the lip corners they tend to look similar). For a full comparison of Polish and English articulatory settings see Święciński (2004: 148).

2.6. Incorrect voicing

Incorrect voicing can result in a foreign accent, because of sounds that are "hissy" and "rustling", "muffled" and "hushed". A number of examples of complete devoicing of final voiced obstruents, mid-word devoicing, devoicing in some grammatical endings and mid-word voicing, are given below:

a) complete devoicing of final voiced obstruents (/b/, /d/, /g/, /z/, /v/, /ʤ/, /ʒ/, /ð/) *ro**d***/rot, *ro**b**e*/*rop*e, *fro**g***/*frock*, *belie**v**e*/*belief*, *ri**dg**e*/*rich*, *bu**zz***/*bus*, *brea**th**e*, *rou**ge***.
b) mid-word devoicing in: *we**b**site*, *be**d**time*, *o**b**session*, *a**b**solutely*, *a**b**surd*.
c) "es"/"ed" grammatical endings – *grow**s***, *dog**s***, *Jane`**s***, *unplu**gged***, *grante**d***.
d) mid-word voicing e.g. *ba**s**ic*, *fanta**s**y*, *i**s**olate*, *di**s**appear*, *foo**t**ball*, *mu**s**n`t*, *analy**s**is*, *lea**s**ing, mi**s**understand*, *wi**sh**-bone*, *fa**c**ebook*.

Although the Polish accent does not sound as "hissy" as German, Swiss or Scandinavian English, where even initial and mid-word devoicing is committed e.g. ***j**u**dg**ement*, *mana**g**er*, ***b**ri**dg**e*, *mu**s**ic*, it may have an irritating effect on an English ear,

which is used to a more vocal and resonant overall sound. Devoicing, which is also more typical of Northern Englishes (Gimson and Cruttenden 1994: 258) and American English, may also be more common of working class people, and could be a sign of sloppiness for some people or simply a manifestation of the economy of effort principle at work. Listening to English native speakers this phenomenon appears to be on the rise, perhaps as an element of the ongoing simplification process (voiceless sounds – 'noises' require less energy to make as the vocal chords remain open during their production).

Let us now take a look at what Polish learners fail to do correctly regarding voicing. In Polish, as in most world languages, the final voiced obstruents /b/, /d/, /g/, /z/, /v/, /ʤ/, /ʒ/ and /ð/ undergo complete devoicing so in Polish *chleb* 'bread' is pronounced as /hlep/, *naród* 'nation' as /ˋnarut/, *wóz* 'cart' as /wus/ and *Bóg* 'God' the same as /ˋbuk/, and this habit seems to be automatically transferred to speaking English where devoicing, if it occurs, is mostly only partial – a phenomon unknown to a Polish speaker and therefore difficult to learn and use appropriately (Krzeszowski 1970: 60; Sobkowiak 2004: 57; Bułatowa 1987: 125). The auditory outcome of this is that Polish English acquires a fairly "hissy and muffled" overall sound resulting from the ample use of /z/ devoiced to /s/, /b/ devoiced to /p/, /g devoiced to /k/, /v/ devoiced to /f//, /ʤ/ to /ʧ/. As a consequence, sometimes it is hard to know what the Polish student means to say when the voiced final consonant becomes devoiced e.g. does he say *ro**d**`* or *rot*, *ro**be*** or *rope*, *fro**g*** or *frock*, *ri**dg**e* or *rich*, *ri**s**e* or *rice, pi**g*** or *pick*, *ba**g*** or *back*, *mo**b*** or *mop*, *cor**d*** or *cour*t, *ru**d**e* or *route*, *bri**dg**e* or *breach*. Needless to say, when completely devoiced, they will sound unnatural and in such cases it is only the context which may help to work out what is being said e.g. in the sentence*: It is something about your rice/rise* the words *rice* and *rise* would be pronounced as /raɪss/ (fully devoiced) and /raɪ:**zs**/(partially devoiced) respectively. A Polish person, on the other hand, would use the first pronunciation for both. In the word *rise* the preceding vowel would simultaneously be made relatively longer than in *rice* and the final

"z" would pronounced as /zs/ or even /zzs/ and not as /ss/, which is ultimately the key feature to distinguish between the two words. Luckily, there are no counterparts with which to confuse the following examples *oran**g**e*, *acti**v**e*, *brea**th**e*, *rou**g**e* and *bei**g**e*.

Students must also remember that silence counts as a voiceless consonant and that is why it partially devoices the preceding voiced consonant. Let us now examine how the process works in more detail. The word *big* when spoken on its own is preceded and followed by silence (`s-big-s) as a result of which, both /b/ and /g/ will be partially devoiced towards /p/ and /k/ respectively with the "long" vowel /ɪ/ being sustained: /`pbɪgk/. The same process of partial devoicing on both sides will take place when the word *big* is preceded by *it's* and followed by *too* in the phrase *It's big too* where the partial devoicing is performed by the /s/ from *it's* and /t/ from *too* respectively to yield /`pbɪ:gk/ (Bałutowa 1987:125). One-sided partial devoicing is also possible: the initial /g/ of *good* will be slightly devoiced towards /k/ by the preceding silence /`k-gʊd/ and the initial /b/ of *boy* will keep the /d/ from *good* fully voiced, which also, in fast speech, might change to a voiced /b/ due to assimilation of place. As for full voicing, it is enough to precede *good boy* with an *a*, which will make the /g/ from *good* fully voiced producing /ə `gʊd(b)`bɔɪ/, or in the phrase *a big animal*, the /b/ and /g/ from *big* are fully voiced as is /z/ from *please* /`pli::**zs**/ when followed by *get*: *Please get* it /`pli:**z** `**g**et ɪt/.

Summing up, what students need to know is that full voicing occurs only when on both sides of /b/, /d/, /g/,/v/, /z/, /ð/, /dʒ/, /ʒ, there is a /b/,/d/,/g/, /v/, /z/, /ð/, /dʒ/, /ʒ or a vowel e.g. *hand**s/z/** in my pocket*/, *at five* /vf/-partial devoicing, but *at fi**ve*** /v/*o`clock*-full voicing. In all other cases partial voicing happens which, unfortunately, Polish learners habitually replace with Polish complete devoicing, making their English sound less vocal and more hissy. It must also be remembered by students that silence is equal to the pause before and after saying something, so it performs the same devoicing function as the neighbouring voiceless consonants. Hence, it is extremely

hard to hear any difference in pronunciation between *A house of car**ds*** and '*A house of car**ts**'* when a Polish person is speaking, which will both most likely sound like the second phrase. What Polish learners of English should remember is that English uses predominantly partial devoicing and Polish full devoicing.

As mentioned above, Polish learners have great difficulty in keeping the voicing of the final voiced obstruents, which affects negatively the overall sound. The key problem is not only inappropriate consonant devoicing, but also, to a lesser extent, incorrect voicing. This mainly concerns word final voiced consonants of base words and word grammatical endings including third person singulars of verbs, noun plurals and possessives and the simple past –"ed" endings, but not only. Incorrect mid-word voicing, on the other hand, is usually heard in words such as *fa**c**ebook*, *ba**s**eball*, *di**s**appear*, *mu**s**n`t* where /s/ changes to /z/ following Polish phonological rules. All in all, regarding the overall sound, southern English is more resonant and "buzzy", even though its "breathy/whispery" phonation (Święciński 2004: 148) and aspiration used on the voiceless stops might seem to contradict this. Polish, on the other hand, comes across as more "hissy" and "rustley" in sound despite its modal voice modal/normal phonation. Students must be constantly reminded that *sa**ve*** is not *sa**fe***; *ben**d*** is not *ben**t***; *len**d*** is not *len**t***; the /v/ in *intrusi**v**e* and *li**v**e* is not /f/ and the /d/in *co**d**e*/ is not /t/ as in *coa**t***, then they will keep the lengths of the preceding vowels and pronounce plural endings in a voiced manner or partially devoiced, but never completely devoiced as Poles are used to doing because of Polish phonology.

An effective and entertaining teaching idea for giving Polish learners a taste of how they sound to an English ear with all the devoicing in place, is to ask them to read Polish words and sentences in which voiced consonants (at least in mid position, not initial) are devoiced e.g. ma**rz**ę 'I'm dreaming'/`maʃe/, po`**d**aję 'I'm passing' /po`**t**aje/, nagi 'naked' /`na**k**i/; `ma**rz**ę o po**d`**ró**ż**ach 'I'm dreaming of travelling' /`maʃe o po**t`**ruʃah/. This, convincingly and amusingly, shows Polish learners how it feels to be on the receiving end when too much devoicing is produced.

Even though most of it is intelligible due to the context though "muffled" in sound, over time it can become irritating to a native speaker.

3. Conclusions

In this article, the most challenging aspects of suprasegmental phonology of Polish students, which the author has observed during an extensive English teaching practice have been outlined. Word stress, rhythm, weak forms, voicing and connected speech features, appropriate articulatory settings and segment length, need constant teacher attention to help students use them correctly to sound more natural, native-like and thus be comfortably understood by other English users.

Overall, the greatest problem of ANY nationality learning English, not only Polish learners, appears to be the unconscious inclination to revert to L1 as the default system when lacking linguistic knowledge (L1 transfer). Thus, learners take advantage of their L1 sound system, phonology, prosodic features, and voice quality settings to compensate for the missing unknown elements. Polish learners of English are no different: generally, their main problem lies in the fact that they tend to over-pronounce i.e. articulate more than required for natural communication making themselves less fluent and natural sounding speakers.

This Polish tendency to over-pronounce is best seen in the underuse of schwa resulting in a jerky and unnatural "machine-gun" rhythm (instead of one which is "Morse Code" like) (Parker and Graham 2009: 53) and it is most obviously manifested in the overuse of strong pronunciations of function words, the use of dictionary pronunciations of words and "lifted" Polish word stress patterns. There is also an underuse of linking devices, elision, aspiration, alveolarisation and correct assimilation, as well English articulatory settings, which all have a bearing on the overall sound of natural native English. Nevertheless, as research shows, all these challenging aspects of English pronunciation, if diagnosed, studied and practised appropriately, may

be eliminated or at least reduced, which would facilitate more effective communication in English. For this reason, English teachers in every country, who know about the potential pronunciation problems induced by the L1 "default system", should make every effort to minimize them so as to enable better understanding and natural near native-like speech production.

It is common knowledge that near native pronunciation cannot be mastered overnight. In fact, it is one of the most challenging aspects of a language to learn, requiring students to work continuously on it from the very outset of their language learning careers. Although many learners of English give up on the acquisition of a native like pronunciation considering it to be too daunting, the effort is worthwhile as it positively affects the quality of communication and the way speakers are perceived. English pronunciation both its segmental and suprasegmental features, are within successful mastery not only for Polish learners of English on condition that they genuinely care about how she/he sounds and is determined to work upon it from the very start, not allowing mispronunciations to become deeply rooted, thus extremely difficult to eradicate later on.

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