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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

BOŻENA NOWAK

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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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Bożena Nowak
ORCID iD: 0000-0001-6677-0516
Instytut Biologii, Biotechnologii
i Ochrony Środowiska
Wydział Nauk Przyrodniczych
Uniwersytet Śląski w Katowicach
ul. Jagiellońska 28, pokój C-151
40-032 Katowice
Poland
bozena.d.nowak@us.edu.pl