



Approaches and Aspects of Advanced Learning in Mechanical Engineering and Economics Students’ Classrooms

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Abstract

It is important to identify the situation our students encounter in the process of learning the English language, especially through ESP courses. We came to an idea to actively engage our students in the process of learning/acquisition and assessment, in order to encourage their learning efficiency. The crucial is students’ readiness to explore new technologies that can enhance their studying. Establishing proper environment for EMI is of great importance for our students, as well as for our country, in the light of world academic flows.

Keywords: English in high education; ESP (English for Specific Purposes); new technologies; advanced learning; EMI (English-medium instruction).

1. Introduction

The increasing student population and its growing diversity presents challenges to the traditional methods of teaching and learning, making it necessary to adapt the classroom to focus on the diversity of students' experiences, engage with many different types of learners and inspire students through a mutual learning experience [1]. After respectfully considering everything said in the Overview on student-centered learning in higher education, we consequently came up with a plan to “launch new strategy”.

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Starting point for the activities being subject to this paper are the ESP courses at the Department of Mechanical Engineering, Faculty of Technical Sciences, and the Faculty of Economics, University in Serbia. Although a similar task could be set up for students of any course at any faculty, we assume that ESP classes offer a better basis and opportunities for students in accessing and performing the task. Staying close to the core of the ESP curriculum, we were keen to find out what our students recognize as helpful, pragmatic and beneficial for the course, as well as for their studying in a whole. The limitation of this study is that the research was carried out only among the university students of two profiles, at two different faculties, and was limited to domestic students. Hence, this study did not encompass many other students of diverse orientations, both in our country and outside of it, so there is no comprehensive insight considering the matter of advanced learning in a broader student population. In spite of this constraint, we found exploring modern ways and means for improving the learning process among students, even in a narrow range of selected ones, worth the effort. Additionally, although we cannot take the credit to be the first seeing the need for the assignment elaborated in this paper, but taking into account the teaching process at both our faculties, the circumstances, opportunities and potential, we conceptualized and launched this project in our way. Arising questions like “How important are teaching methods?”, “Is there a strict miraculous teaching method that every lecturer has to follow in order to have success in the classroom?”, “What benefit brings the student-centered method”, and similar, keeps us vulnerable to learning deficiencies in teaching and sensitive to meeting the students’ need. We have agreed that there are different teaching methods and approaches all around the world, where many of the most successful teachers do not confine themselves to a single method, but synthesize from a variety of methods. If there is a single unifying characteristic then it is probably the ability of successful teachers to develop close rapport with their students.

2. Teaching/studying process

Teaching, as well as studying, is dynamic process, never in an equilibrium. However, just like the life, teaching-learning process must be optimized, while intending to keep balance between the academic environment and the target of teaching. Adaptation is the key to evolution and it applies to teaching also. Nobody regulates the environment alone, either for living or for teaching. So, it should be the same in our classrooms, with our students – future engineers and economists: teachers and students play an equally active role in the learning process, and students are not viewed as “empty vessels” who passively receive knowledge through lectures and direct instruction, with an end goal of positive results from testing and assessment. Teachers and students (both subjects of their own teaching and studying processes) go through constant growth of cognitive, socio-affective and skill development, where there is interchange with the medium in which they are inserted and acting.

2.1. From teachers’ point of view

Since teachers are actively involved with classes’ organization and are largely responsible for implementing it, we, ESP teachers, consider as precious sharing our insights on the state of modern teaching, as well as presenting our common view of what we need to perceive, search and improve. We recognized two parallel sides of our teaching: a classical one of observing the course syllabus, and a modern one of following the opportunities and means of today’s studying. How to intermingle those, while staying within the prescribed limits and in the focus of young people who are genuinely interested in new flows and ways of studying? How

to elicit and strengthen students' motivation for searching them? How to respect students' wish for quick, digestible knowledge and faster studying outcomes? How to carefully avoid leaving the students aside this process while imposing on them the pre-made solutions? In a word: how to build advanced ESP learning environment for the students, with the participation of the students? By adhering to this, we came to an idea to actively engage our students in the process of learning/acquisition and assessment, what would encourage their learning efficiency. Being aware of the challenging factor related to their beliefs about the nature of learning ESP as a subject consisting of a list of terms and a set of grammatical rules which are to be memorized and separable skills to be acquired rather than a set of integrated skills and sub skills [2], we turned to the teaching practice of tailoring instruction to meet needs of the students, even to elicit needs from them, wishing for not only a very few of them to demonstrate high levels of aptitude or competence in one or more domains.

2.2. ESP classroom – a laboratory for advanced learning

ESP classrooms of advanced learning should meet some of the following general principles:

- Needs to raise studying standards are at least twinned, with the urgency of providing quality access to the latest educational opportunities;
- Students are inspired by visions and possibilities of advanced learning that drive them to deeper research;
- Classrooms are well equipped so students can easily understand the intersection between academic and professional achievement;
- Students are highly respected and the flexibility of the education process is raised to the highest level
- Students are engaged in the construction of the learning process which guarantees a solid foundation for educational development that help students master the field of their future profession.
- High expectations are set for all the students, and transmitted with passion and enthusiasm.

Considering the fact that all the principles mentioned above are utterly valuable, and seeing a certain ineffectiveness of existing teaching through transmission of knowledge, we encouraged our students to take part in needs-oriented approach in the classrooms. This approach is called so because students are not even conscious of many needs they have in the learning or studying process until they meet a practice which does not fit. So, they seated in the driver's seat of their learning experience and facilitated the process of learning in order to learn. They were set a permanent assignment at the beginning of the last school year, throughout two semesters, to explore ways, approaches or resources for new ways of studying, meaning to explore new studying technologies in the world, and report anything they find useful for both themselves personally and for the group. They were given instructions, not in the form of a numbered list, but in a form of a simple guidance in order to clearly recognize the whole of the task. Hence, the most common error, to make task too complicated for the students [3] was avoided.

3. The research and the outcomes

The English language courses (ESP courses) in mechanical engineering and economics students' classrooms are

currently very important in their cores, whereas we also found it especially suitable for students to explore new technologies and ways of adopting ESP, as well as any of other non-language subjects, and to establish new ways of communicating with lecturers and with the international students. But yet another aspect of how the classroom should function, viewed through the broader application of the English language and the benefits of it – preparing students for the professional, international environment – certainly is a matter of particular concern. Here are some of the new technologies applicable to teaching/learning (and connecting!) process, highly regarded by our students as useful, practical, inspiring, provoking and worth of teacher/student interest. We only included those technologies that were selected by both groups, while those ones selected only by one of the groups remain for later consideration and revision, such as celly, Google classroom, knewton, and some others.

- **Zoom**

In a few words, Zoom is a way of modern learning for the modern students.

Zoom enriches teaching and learning by expanding traditional classrooms with video communications to meet the needs of today's students. It easily maximizes school resources which are supposed to expand students' capabilities and educational offerings. Student learning outcomes can be improved with Zoom by increasing students participation and learning retention with virtual and hybrid classrooms and micro-learning. On the other side, Zoom provides modern enterprise video communications, with an easy, reliable cloud platform for video and audio conferencing, collaboration, chat, and webinars across mobile devices, desktops, telephones, and room systems. Zoom rooms is the original software-based conference room solution used around the world in classrooms and training rooms, as well as in board, conference, huddle, executive offices, etc. Over 17,000 educational institutions, including 96% of the top US universities, improve student outcomes by using Zoom for virtual and hybrid classrooms, office hours, administrative meetings, and more.

- **Flipped classroom**

It is a new classroom style of inverting traditional teaching methods by delivering instruction online outside of the classroom. Students watch lectures at home, at their own pace, communicating with lecturers and colleagues via online discussions. Two key components of the flipped classroom model are activity learning and educational technology, where both of them fundamentally influence student learning environments.

There are various benefits attributed to the idea of utilizing the flipped classroom approach, some including:

- It uses a more application-based approach for students quite different than learning in a traditional classroom setting;
- Students can receive great instructional support in the classroom from the experts of various fields;
- It includes all forms of learning (i.e. oral, visual, listening, hands on, problem solving, etc.);
- Communication is greatly emphasized in a flipped classroom setting, essentially referring to student-student and student-teacher interactions;

- Students must take into account the responsibilities given to them in regards of learning the foundational information provided, as their personal work and contribution will be reflected in the grade that they receive at the end of the course;
 - Students receive instant feedback;
 - Class time is spent doing interactive activities to illustrate concepts;
 - Students are better prepared for more difficult courses in the future.
- **Glogster: multimedia poster**

Glogster is a web tool that allows users to create virtual posters combining text, audio, video, images, and hyperlinks and to share them with others electronically. It is an online platform for digital and interactive learning where students can creatively express themselves and their knowledge. Using Glogster, teachers can establish class lists and monitor students' activity while protecting privacy and anonymity. Creating a glog could be an easy task using think-aloud approach, modeling selected appropriate features, organizing the elements with the reader in mind, and developing ideas using multiple modes. It must be mentioned that there is a Glog video library where students can easily find what they are looking for.

- **Skype-a-thon**

Skype-a-thon is a global learning event that makes it possible for students to virtually travel around the world and connect beyond the classroom. Modern students are members of a global community more than ever. The walls of the classroom have expanded in order to connect them with cultures and environments both near and far away, and that offers diverse perspectives and help them gain compassion and understanding for each other, the environment, and the health and welfare of neighbors all over the world. The Skype-a-thon is a two-day learning event where students and teachers—as a global community—travel the virtual distance during Skype calls. Classrooms can use Skype to take virtual field trips to popular landmarks or other places of interest, or to connect with guest speakers in fields of study where local experts may not be available—as well as unite with nearly half a million students worldwide! Last year, 9.8 million virtual miles were traveled—this year, the goal is set at 10 million. Skype-a-thon also encourages students to engage in positive, safe, legal and ethical behavior when using technology, including social interactions online or when using network connected devices.

- **Moodle**

Moodle is a free, open-source learning platform designed to be a secure and integrated system for teachers to create personalized learning environments. It is used for distance education and various versions of e-learning in schools, universities, workplaces and other sectors. Educators can make private websites with online courses to help users and students achieve learning goals.

Why is Moodle so popular, since more than 90 million people use it worldwide?

The platform is very easy to use, with a simple interface, a large number of features and is updated frequently so that it can give a great experience in both teaching and learning. Because it is open-source, users can customize

and tailor Moodle in any way to suit their needs. It is multilingual, which ensures that there are no linguistic limitations to learning on the site. The community is currently translating to more than 120 languages so users can easily make the most out of Moodle. Developers are very committed to safeguarding data security and user privacy, so new controls are constantly being implemented in the software to protect it from data loss, any kind of misuse and unauthorized access. Luckily, Moodle is web-based, meaning it can be acquired from anywhere on the globe. Users can use it on different search engines and on a variety of devices (mobile, computer, tablet...). With its modern design and interface that is accessible and responding, students can keep track of all their courses, tasks and progress. In conclusion, Moodle has earned the title of the most-widely used learning management system and is an environment that makes learning collaborative, engaging and fun.

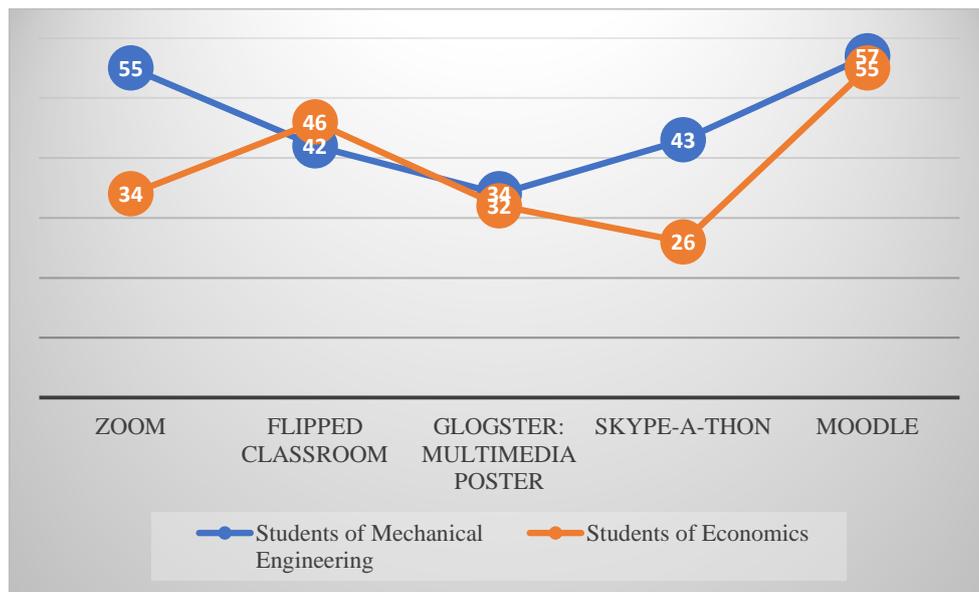


Figure 1: Distribution of students' interest in new teaching/learning technologies

The graph shows how many students are engaged, ready to use, informed, or just interested in a particular new technology. Also, the graph shows almost undivided attitudes of the students' from each of the faculties towards new technologies, and it is clearly seen that prejudices about better orientation of students of technical sciences in discovering and getting acquainted with new technologies can be abolished.

4. EMI (English-Medium Instruction) Methodology for Making the International Studying Environment

After seeing the possibilities regarding the approach to improve ESP teaching, and certainly teaching in any other non-language subject, it is necessary to draw attention to the aspect, or a positive trend that has been taking place in the world for several decades, which did not bypass neither Serbia, nor our two faculties. Namely, there is a fast-moving worldwide shift from English being taught as a foreign language (EFL), or as a language for specific purpose (ESP) to English being the medium of instruction (EMI) for academic subjects [4]. Described as a "galloping" phenomenon now considered "pandemic" in proportion, the use of English at higher education institutions across the globe is today considered the most significant trend in educational internationalization [5]. This is a millennium in which the connection is the most important, in every segment of

private and social life, and the linkage in higher education, which is mainly based on English, should not be ignored. English has in itself the fundamental value of a common language, as an amazing world resource which presents us with unprecedented possibilities for mutual understanding, and thus enables us to find fresh opportunities for international cooperation [6]. Teaching in English at universities, particularly where English is not the mother tongue of the students, has been a well-established practice around the world for many years. To be mentioned, this methodology is also applied in some universities to other languages, French and German, for example, although in such cases this tends to be significantly less common. The methodology of English-Medium Instruction (EMI) is practiced in areas as geographically distinct as Japan, Italy, Israel, South Africa, China or Spain. Everywhere the aim is the same: to teach the subject while speaking English. One of the objectives of EMI is internationalizing universities, institutions' need of higher level of recognition, optimizing local students' intake, and additionally attracting the international students. In the case of Europe, EMI began in the University of Maastricht in 1987, with international management program. Maastricht University is often praised for the fact that it is one of the most internationally oriented universities, with more than 50% of the enrolled students coming from abroad. Thus, the concept of 'an international classroom' that prepares both native and foreign students for a job on the world labor market proves to be quite valuable. However, situation in Serbia with regard to this aspect is to some extent different. At all state universities in Serbia, there are only a few hundred foreign academics on basic, master and doctoral studies. Due to the low interest, and the great potential of the studies in Serbia, the Ministry of Education, Science and Technological Development formed a working group and launched the "Study in Serbia" project [7]. They, for their part, have accepted the challenge and taken up a role in constructing the international area for higher education in Serbia. This is of the highest importance, given that Universities' independence and autonomy ensure that higher education and research systems continuously adapt to changing needs, society's demands and advances in scientific knowledge. Therefore, joining to EMI initiative is to be expected, and it is fair to say that more than 25 years later EMI has expanded and now finds itself in a phase of consolidation. The great flourishing of EMI in Europe was produced in the context of configuration that is called the European higher education area, in the wake of the Bologna Declaration. From 2002 to 2007, EMI courses in European universities increased by over 300 percent. The Netherlands, Finland and Sweden, for example currently have high proportions of EMI programs at the universities. It should be mentioned that the medium of instruction (on an academic level) in Maastricht, is thus mostly English today. Although EMI usually refers to teaching at university level, there are an increasing number of secondary, primary, and even pre-schools which teach using the English language. Perhaps unsurprisingly, there is more EMI at tertiary level than at secondary level, and more at secondary than primary. There is also more EMI in the private sector than in the public sector as EMI is extremely marketable. Teachers need to break away from teacher domination of classroom and the emphasis of subject content and adopt a language- or skills-based, communication-oriented bilingual approach to teaching. This approach recognizes student participation and teacher responsibility especially for bilingual support for learning [8].

5. Discussion

Today, it is required that teacher skills are a broad area of consideration. Teachers know they must adapt to the transforming education landscape, and students appreciate teachers' expertise, since they want quick, digestible knowledge acquired in susceptible and more receptive way—in a word in a catchy way. Teachers have their

eye on new technologies that may advance teaching/learning proses, and make a track for forthcoming trends and innovations, being ready each time to explore, revise, redesign, and augment their teaching and the class process.

Due to the fact that information today is disseminated quickly and more widely, our students were liberated and empowered through the process of accomplishing the set assignment. We, lecturers, supported them vigorously, not only from a didactic perspective, but also by being a part of a homogeneous group working together on seeking to innovate and improve learning/teaching environment. The merits of the creation of such environment are almost common knowledge, but it should be emphasized that the merits may be higher on the side of the students who showed an enviable professional macro-skill in comprising knowledge. During the task, students combined the knowledge related to both language and content, strengthening themselves in competencies related to disciplinary, academic, or professional domains.

Potential problems or shortcomings in our case study can be seen as:

- Pros and cons of web-only research
- Implications of flexible timing and pacing of assessment (long period for accomplishment)
- Assigning to large groups (each included 55-60 students)
- A few students did not provide equal participation in the joint task
- Mentoring assessment standards
- Hardly accessible individual student skills
- Insufficient promotion of particular parts of the outcomes

Being aware that they are not fully listed above, we remain focused on better tracing of the route along which the students should go through their studies in the future. The last, but not the least, observation in this discussion concerns EMI methodology. Although being completely convinced that this extremely complex and comprehensive way of studying deserves much more space and analysis than it received here, we just had to mention it, since it is good to consider it and evaluate it at every opportunity. It is certain that there is a room for a better conception, a more specific approach and a more explicit domain. It's easy to get overwhelmed by suggestions, yet, there's no roadmap or guide for this, and no one has created a fail-safe way to make this happen. The truth is both of us – students and teachers – have to keep figuring it out as we go along together, and remained supported and successful in the digital age of learning by being sensitive for 21st-century skills, digital teaching skills, new skills, etc., in a word modern skills for modern teaching and learning.

6. Conclusion

Our research can be described as a case study about the research conclusions from more than 55 students in each group, studying at the Faculty of Technical Sciences and the Faculty of Economics at the University of Priština in Kosovska Mitrovica. Two lecturers working in the same institution tried to review their pedagogical practice, ours and students' motivation, aspects of teacher's malaise and wellbeing, reflections on autonomy of each of us and cooperation for motivation in education context [9]. This paper provides some general

information about attitudes of two groups of our students toward new technologies and new possibilities in studying ESP course as well as all the other scheduled courses, and certainly toward reason for higher and stronger acquisition of EFL. Serbia is a typical EFL (English as a Foreign Language) country where the English language does not have an official status, but its reflection on competence or its usefulness should not be neglected. The most important thing a teacher can aspire to, is developing as wide a range of teaching methods as possible and use the most appropriate one/s to promote optimal learning for each moment of learning while teaching. Therefore teaching can never be distilled down to a scientific principle or described as a practical craft because it is essentially an art. This is a very important conclusion because it distances from the simplistic dogmatic approaches, often diminished by traditionalists, and gets closer to those who strive to constantly refresh and improve teaching.

7. Recommendations

It is for sure that the topic we based this paper on might be of close interest for wider teaching and studying public, as well for us to keep it searching in the future, since there are often times when added research would be necessary. We hope that our point of view is easy to be followed and can be utilize in a great extent as a relevant and useful idea for conceptualizing some main teaching/learning materials, also bonding or covering ones.

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