

Using Challenge-based Learning Activities in Teaching Project Management

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Abstract

The present paper explores the implementation of Challenge-Based Learning (CBL) within a Project Management course offered to undergraduate students specializing in Translation and Interpretation at the Department of Foreign Languages and Communication, Technical University of Civil Engineering Bucharest, Romania. This educational approach was introduced in the 2023–2024 academic year and will continue through 2024–2025. The motivation for integrating CBL into the curriculum stems from the increasing relevance of project-based work across all professional domains. Organizations such as corporations, educational institutions, and even high schools now operate through project-oriented structures. Project management has become integral to modern workflows, including curriculum development and student engagement strategies within universities. Consequently, aligning academic instruction with real-world practices has become essential. CBL offers a practical and dynamic approach to teaching, aligning well with the skills required by European Union educational standards. These include competencies such as planning, forecasting, budgeting, risk management, tracking progress, communication, leadership, collaboration, and problem-solving, skills highly valued in EU-funded initiatives like Horizon Europe. While project management may not always represent a standalone career path, it is increasingly viewed as a crucial skill applicable to various professions. For this reason, students must develop both theoretical knowledge and practical experience to meet current job market expectations. The course structure under CBL includes two main components. The first half covers theoretical concepts of project management, while the second half involves hands-on practice through hypothetical scenarios. CBL's three phases, engage, investigate, and act, mirror the life cycle of a project: initiation, planning, execution, monitoring, and closure. This alignment enhances students' understanding of project workflows while reinforcing their critical and creative thinking skills. The engage phase begins with identifying a big idea, which encourages students to reflect on broad societal themes like sustainability, democracy, or community well-being. This abstract concept then leads to the formulation of an essential question, connecting students' personal interests and community needs to broader real-world challenges. Finally, this question is refined into a tangible challenge, a prompt for students to dive into deep inquiry and practical exploration. By embedding CBL into the Project Management curriculum, students are not only introduced to relevant knowledge but are also guided to apply it in ways that reflect the collaborative, problem-solving nature of modern professional environments. This integration prepares them to meet both national and European standards for career readiness.

Keywords: Active learning, teaching with technology, collaboration, motivation

1. Introduction

A course such as the one in Project Management, taught, since its introduction, in the academic year 2023-2024, and continuing with 2024-2025, for the Translators and Interpreters specialization, undergraduate level, within the Department of Foreign Languages and Communication at the Technical University of Civil Engineering Bucharest, Romania can constantly be improved by considering the students' needs function of the present-day context. It is currently a very popular domain of activity, with terms, and working methods being referred to in all domains.

Throughout the course, students will learn, based on both examples and theoretical concepts, what a project is, how to convincingly propose a project idea, how to fill out the initial documents in which the project is proposed, what aspects need to be considered, and how to present a business in an appealing way, drawing from potential fields of their future professional activity, such as translation agencies, online language course platforms, understanding the target audience's requirements, and adapting to their needs. They will also learn how to make necessary changes within a project based

on issues related to resources, client requirements, and various external problems that depend on the context of a particular economic, political, or other situation.

In addition, students will reflect on possible risks associated with a project and how to find solutions to these. They will critically analyze various project proposals or find solutions for different scenarios related to problems that may arise during a project. Leadership, types of leaders, and the ability to motivate a team in various conditions will also be among the professional competencies targeted and practiced throughout the course.

Students will also reflect on how they work most comfortably, whether in groups, individually, or in pairs, and the reasons behind this. During the course, students worked in pairs, groups, individually, and eventually based on their own preference. Familiarity with standard documents and key concepts from the field of project management can benefit students in the future, alongside the development of creative skills, the ability to propose projects, problem-solving skills, team communication, and adapting the project in response to various factors.

Among the main professional competencies are creativity, critical thinking, anticipating problems and finding solutions, motivating a team, adapting to various external conditions and the different personality types of team members, as well as selecting and adapting standard documents used in project management for projects in specific fields.

In order for students to be adapted to the context and requirements of today's world, Challenge-Based Learning [1] has been considered a suitable framework in order to offer adequate teaching and learning methods. The idea for using this method has started based on a workshop about CBL held in February, 2025 at the Technical University of Civil Engineering, where the author of the present paper teaches. The workshop has offered insight into applying CBL to the subjects each of us teaches and we had as an assignment to apply during our classes CBL. The training, 5th Training: Challenged Based Learning and Research, took place on 20-21 January 2025. Professors Cornelia Grofu and Dietlinde Koeber from the same university were the trainers. They presented what they had been taught during their own training, which took place in September 2024, in Cyprus, in collaboration with universities in the EU-Conexus partnerships.

1.2 What is CBL

First of all, how could we define CBL? What does it refer to? The definition is not a unique and even easy one, for that matter, due to the "lack of definitional clarity coupled with the varied range of approaches and frameworks" [2], which leads to the flexibility and multidisciplinary of CBL [2]. CBL focuses on "working on authentic and sociotechnical societal problems [3] [4]" [2]. We can rely, however, on "commonly agreed characteristics of CBL" [2], such as global themes, real-world challenges, "Collaboration between students, academic and extra-academic actors" [2], and use of technology. Global themes are those related to sustainability or war, for instance [2]. Students are expected to "have skills in a global environment, a global mindset (Sternad 2015), knowledge of global problems, and the ability to face global issues themselves [5]" [2]. What is significant is that "Solutions to global issues should have a local focus [6] and applicability [7]" [2]. Real-world challenges "require skills of scientific knowledge, soft skills (such as teamwork and communication), basic knowledge (in microbiology and toxicology), and applied knowledge (in a practical context)" [2]. When it comes to technology, withing CBL, it can support "communication with project stakeholders, engagement with the public, accessing and researching information, publishing outcomes, collaborative workspaces, computational applications and tools, and accessing module content through a VLE" [2].

CBL aligns well with the role of universities in society: "Higher education institutions (HEIs) as providers of knowledge are closely interconnected with societal challenges and the transformation to a sustainable society" [8].

One definition of CBL could be the following one, since it encompassed all the aspects previously mentioned:

Challenge Based Learning is an engaging multidisciplinary approach to teaching and learning that encourages students to leverage the technology they use in their daily lives to solve realworld problems. Challenge Based Learning is collaborative and hands-on, asking students to work with peers, teachers, and experts in their communities and around the world to ask good questions, develop deeper subject area knowledge, accept and solve challenges, take action, and share their experience [4].

CBL started off as an approach proposed by Apple company in 2008 [9], in order to help schools adapt to the requirements of the 21st century [8].

2. Materials and Methods

Project management is, above all, a practical field, which is why students were given scenarios for which they had to find solutions or offer analyses and personal opinions based on critical thinking. Solutions could be developed individually or in groups, often at the students' choice, considering that projects can vary in scale, smaller or larger, and that some businesses may be individual or carried out within a small team. For certain scenarios or presentations of information, ChatGPT was used, with results adapted and selected by the course instructor, in order to provide variety and help students explore new ideas and solutions. The use of scenarios was considered necessary to give students a sense of the types of problems that may arise during any project and to show them that various competencies are needed, especially creativity and problem-solving skills, not just the ability to propose a project. The way they interact with beneficiaries, clients, colleagues, and project leaders is just as important as their organizational skills and knowledge of the documents specific to project management.

As the author of the present paper had started teaching Project Management using scenarios, she considered welcome the suggestion offered by the trainers during the workshop from 20-21 January 2025 to use CBL to motivate students even further. CBL was considered by the author of the present paper to give further insight into the way in which students could adapt to the real-world context [2] and to use what they have learned during the Project Management classes activities. The theoretical notions need to be strongly backed up by practical activities, since learning by doing is the most efficient. Otherwise, students remain with some abstract notions which they have never actually used. As Project Management is a varied field and can be applied to various types of projects in various domains, this can bring further materials and situations for scenarios and CBL activities.

The main goal in teaching any course, and Project Management in particular, is to maintain active participation and active learning for students during classes. For this purpose, the author of the present paper has considered CBL to be a good methodology, next to project-based learning or problem-based learning, the two being considered similar [10], approaches are considered suitable in order to motivate students and allow their engagement in the activities, as well as to increase their motivation.

Source [10] identifies several differences between PBL, which is problem or project-based learning and CBL: first, "PBL is focused on a project solution, whereas CBL has a broader range of inquiry"; second, "CBL connects students to real world problems they see in their communities."; third, "In CBL, students are encouraged to reflect on their learning and the impact of their actions [11]." With CBL, learners are asked "to be not only problem solvers, but also problem definers and problem framers" [12].

Students can benefit from having a structure of CBL laid out for them. As an example, source [4] presents CBLbased on three phases: engage, investigate, and act. Source [13] gives us the following structure: "1. Theoretical background; 2. Initial challenge situation; 3. Established challenge situation; 4. Guiding activities; 5. Proposed solutions; 6. Implementation; 7. Conclusion; 8. Continuous improvement." These are just two frameworks and suggested steps in working with CBL exercises. The first framework, the one by Apple, was with the three phases, was used during the training session from February 2025. The author of the present paper has applied it during some class activities, yet the author of the present paper would like to expand using CBL during the Project Management course in the future. The author of the present paper has asked students to think of one big idea, then further consider it in detail, in order to decide what question could be further investigated, and, further on, what they could do in order to start their action regarding the chosen question for further study. Students were told what a big idea could be, which was an issue of global concern nowadays, and further on they could think of a concrete objective they could further investigate which they believed was relevant to themselves and to their community. In this way, the practical aspect of Project Management was clearly underlined.

Otherwise, students could be given activities based on hypothetical scenarios. For instance, in the scenario titled Budget Cuts, which was created by Chat GPT and further refined, as well as selected for presentation to the students during the course, we face the following situation: "Midway through the project, you realize that your budget has been cut by 20%. You need to adjust your WBS and Gantt chart to prioritize essential tasks and delay or eliminate non-critical ones." If we consider turning this into an actionable challenge which is sustainable, we could consider, for instance, raising awareness

for project managers about the benefit of using WBS and Gantt charts during their restructuring of the project, or organizing workshops to improve the creativity of project managers in dealing with changes and readjustments in project management.

In the case of another activity based on a scenario, regarding leadership style, and namely the use of the situational leader, the instructions are the following: the project manager is faced with: "A time-sensitive project with a tight deadline and a clear set of requirements" (based on Chat GPT) for which he or her needs to choose the leadership style which is best suitable for the situation. If we consider applying CBL, then we could engage students even more and decide to propose organising workshops and coaching sessions in order to practice the way in which a leader can change leadership style function of the situation.

After students decide on a solution in order to fix matters within the hypothetical scenario, they may consider further on how to apply CBL to it, considering the issue further. With CBL, students can have the opportunity to further develop their projects and make the results of their research applicable in order to help their local community, which could be the workers in the domain of project management. In addition, the CBL phases, engage, investigate and act, can be considered steps in order to be taken to start off considering arguing in favour of the importance of a project. The Project Management phases (initiation, planning, execution, monitoring and closure) may be reconsidered within this framework, and allow students to become more aware of the way in which they formulate the practical aspects of a project proposal.

Encouraging creativity [14] can clearly motivate both students and future team members working on a project.

3. Results

CBL can offer guidelines regarding the practical usage of a project and, especially, the way in which it can benefit the close, local community of the one proposing it. Considering a project with respect to the larger needs of a community, within the global issues and the needs at world-level, can make the project all the more significant, and able to have a high impact. Students can benefit from the phases set forth by CBL and consider them as guidelines when they consider improving their project proposal.

4. Discussion and Conclusions

CBL can provide additional guidelines and outlines to create a project proposal. The project proposal is significant in order to receive the needed sponsorship and partnerships. It can help project managers persuade the sponsors to support their project, and it can also help them persuade their team members that the project is truly useful to the others and worth their efforts to be involved in it. Personal conviction in the way in which a project is actually useful to the others is a key factor in making the team members make honest effort to do as the project manager tells them to and to contribute to the team work. Willingness to collaborate is a key factor in working on projects, and seeing a clearly-cut plan based on CBL can increase motivation. Smooth collaboration can be improved once there is personal motivation to work on the project, as the project aligns with common values for the individuals involved in the project and to their community.

The Project Management course can highlight its practical dimension by applying CBL.

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