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# **BlueProject: An Application for Managing PBL Projects**

## **Project report**

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# **Abstract**

The project entitled "BlueProject: An Application for Managing PBL Projects" was created by the students of the Technical University of Moldova: Mihaela Catan (FAF-231), Daniela Cebotari (FAF-231), Daniil Cebotari (FAF-231), Janeta Grigoraş (FAF-231), and Maxim Isacescu (FAF-231), under the guidance of Mihail Gavriliţa. This project consists of the following chapters: Introduction, Midterm 1 (Problem Description, Problem Analysis, Problem Statement, Proposed Solution, Target Group and Customer Validation, Comparative Analysis), Midterm 2 (Idea Validation, Rethinking and Pivoting, System Modelling, Visual Representation of the Solution), Conclusion, Bibliography, Appendix.

This research presents BlueProject - a concept of an online web application designed to revolutionize project-based learning (PBL) environments. BlueProject addresses the prevalent issue of project failure by offering streamlined guidance for students, instructors, and advisors. The platform emphasizes clear objective setting, requirements management, resource planning, progress tracking, and community engagement. Through dynamic features like a visual dashboard, real-time collaboration, and automated reminders, BlueProject ensures project success and fosters a vibrant learning community. The application's impact extends to improved critical thinking, problem-solving, and information retention, making it a valuable tool for educational institutions and startups alike. With its user-friendly interface and cost-effective development approach, BlueProject sets a new standard for PBL management, ultimately contributing to the long-term viability and sustainability of educational initiatives and startups.

**Keywords:** Projects, Management, Efficiency, Project-Based Learning, Problem Solving, Web Platform, Collaboration, Communication

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# Introduction

In an era marked by rapid technological advancements and evolving educational paradigms, the efficacy of project-based learning (PBL) has emerged as a critical area of concern. This research delves into the domain of Education and Entrepreneurship/Startup Management, focusing on the challenges surrounding the implementation and management of PBL initiatives across diverse educational institutions and entrepreneurial ventures.

The motivation for this research is the fact that more than half of global projects, including those employing Problem-Based Learning (PBL) approaches, fall short of achieving their intended goals. This alarming statistic underscores the pressing need to address the deficiencies in PBL initiatives, as their failure not only hampers skill development crucial for academic and professional success but also results in a misallocation of valuable educational resources.

The prevalence of failed PBL initiatives is relevant, because not only it hinders the cultivation of essential skills like critical thinking, collaboration, creativity, and effective communication but also signifies a missed opportunity for innovation and progress in various fields. The impact extends beyond mere inefficiency, striking at the heart of educational and entrepreneurial endeavors, highlighting the urgency of devising effective management solutions.

The primary objective of this research is to create a concept of an application, BlueProject, that addresses critical needs by providing a comprehensive platform for streamlined project management, encompassing aspects such as clear objective setting, requirements management, resource planning, progress tracking, analytics and reporting, and community engagement.

The development of BlueProject is informed by compelling insights from web articles, research papers, as well as genuine surveys and interviews, designed to understand the needs of the target group. By channeling resources into refining the web application, it is aimed to maximize impact and reach goals with precision and efficiency.

In the following chapters, it is examined the identified problem, emphasizing its relevance and stakeholders. Then the readers delve into a comprehensive analysis and a one-sentence problem statement. The proposed solution is introduced, followed by an assessment of its alignment with user values and needs. The value proposition follows, after which the business model and comparative analysis are detailed, followed by a concise SWOT analysis. The next part consists of idea validation through surveys and interviews, which arose the need for rethinking and pivoting. Last but not least, this paper includes system modelling and a visual representation of the solution.

# Midterm 1

## Problem Description. Problem Analysis. Problem Statement.

### Problem Description

A startling 70% of global projects fall short of achieving their intended goals and reaching a level of effectiveness deemed satisfactory[1]. Regrettably, this statistic extends its reach to include Problem-Based Learning (PBL), where failure signifies instances where the application of a problem-based learning approach in education does not yield the desired outcomes or meet the set objectives.

This problem primarily affects a wide range of educational institutions and initiatives within the domain of Education and Entrepreneurship/Startup Management. This includes K-12 schools, Higher Education institutions (such as Universities and Colleges), Start-up Schools, Innovative Learning Environments, Entrepreneurship Accelerators, Incubators, Online Courses, Massive Open Online Courses, Community-Based Initiatives, Corporate Training Programs, Research and Innovation Labs, and Hackathons.

The widespread use of Problem-Based Learning (PBL) approaches in numerous institutions underscores the significance of addressing the issue of failed PBL initiatives. This problem goes beyond mere inefficiency; it strikes at the heart of skill development crucial for success in both academic pursuits and the professional realm.

The failure of PBL initiatives directly impedes the cultivation of essential abilities like critical thinking, collaboration, creativity, and effective communication[2]. Moreover, the premature termination of projects, often observed at the conclusion of a semester or event, carries even broader implications. It signifies a missed opportunity for innovation and progress in various fields[3]. Valuable projects with the potential to contribute to advancements in their respective domains are left incomplete or, worse, abandoned altogether.

This situation leads to a dual loss too. Not only does it block the development of critical skills in learners, but it also results in a squandering of valuable educational resources. The investment of time, effort, and financial resources in these projects becomes an inefficient allocation. This misdirection of resources adversely affects the institutions and organizations involved, diverting them from potentially more productive and successful initiatives.

While these events evolve, rise, and fall, they include many parts that have an impact either directly or indirectly, known as stakeholders. As an example of the directly influenced parts are of course the participants of the events themselves, often represented by students, the main unit that ensures the existence of events, diversity in thinking, approach to the problems, and entire favorable and productive vibe; and of

course the instructors, who can be represented by teachers or even simple volunteers, who act as guides, supporting and structuring the learning process while students take on self-directed roles in problem-solving and critical thinking. The other side, where the consequences are hard to reach and which play a long-term game, has many representatives, like the government, that get workforce development and economic growth, making it a valuable tool for societal progress; organizations that hold PBL events, because they aim to ensure event success, often seeking sponsorships and revenue; or even private companies that seek talent, innovation, and collaborative projects.

Therefore, this problem is highly relevant due to the significant benefits that effective Project-Based Learning (PBL) management can bring. PBL environments have been shown to yield 63% greater gains in student performance compared to traditional teaching methods[3]. As a result, there is a growing demand for adept oversight of the learning process, highlighting the need for proficient PBL management. This underscores the relevance and resonance of this issue within the educational landscape. The fact that nearly 44,000 students attended PBL-based boot camps in the United States in 2020 further emphasizes the significance of this approach[4].

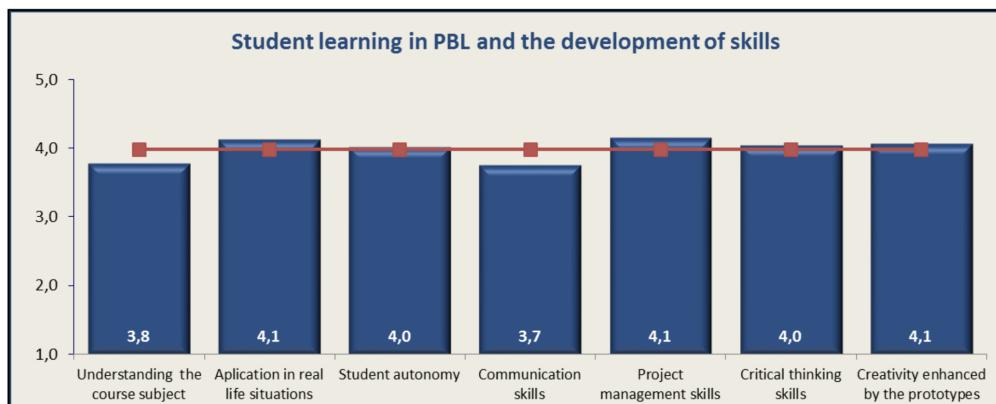


Figure 0.0.1 - The enhancement of skills in PBL students

As a result, project failures have been studied and it has been found that PBL projects don't manage to achieve their goals due to a variety of reasons. The most prevalent reasons for project failures, according to the Project Management Institute, include changes in project goals and improper requirements collection[5].

An estimated 41% of projects fail due to unclear project objectives and milestones. Setting clear goals helps to track the milestones and the progress, giving a clear picture of where the project is at the moment[5]. In the absence of these objectives, the end goal can become vague, making it challenging to measure progress or make informed decisions.

Around 39% of projects don't reach their final destination due to inaccurate requirements and lack of resource planning[6]. In the majority of cases, some of the team members are working on too few tasks

while others are working on too many tasks simultaneously. Moreover, a lot of projects end their existence after the end of the semester or at the final of the event that they were established for. Students start a project, work diligently on it for a day, a month, a semester, and then never return to it again.

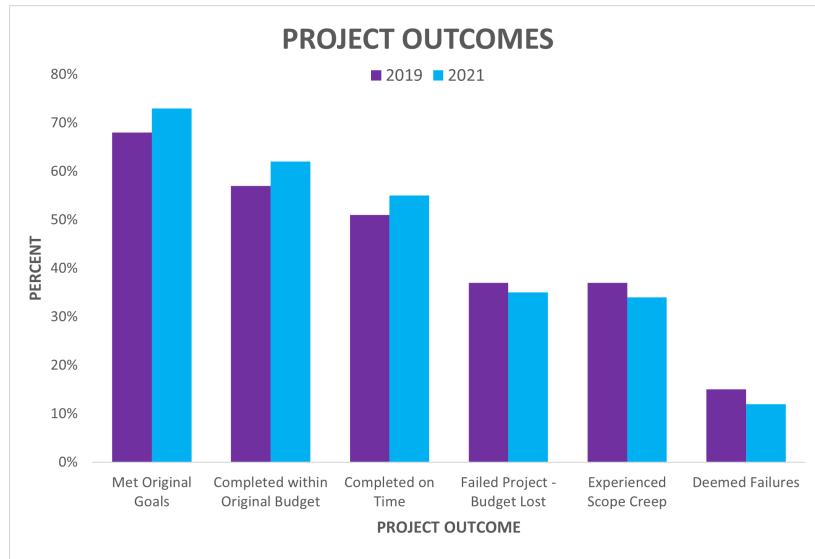


Figure 0.0.2 - Project Outcomes 2021

Additionally, a shortage of advisors or a limited network can restrict access to valuable external guidance and expertise, potentially resulting in decision-making errors.

The lack of success in completing a Problem-Based Learning project is a major problem because it negatively impacts students' engagement, critical thinking, problem-solving skills, and retention of information. [7] Moreover, if hackathons and innovation initiatives are considered, project participants can easily be trapped in those 14% of the failing startups because of bad management inside the team[8] or in those 58% of the startups that have a lifetime of under 3 years[9].

### Problem Analysis

In both Problem-Based Learning (PBL) projects within educational contexts and entrepreneurial startups, the pivotal factor that often determines success or failure is effective management. Unfortunately, a prevalent and critical issue associated with these endeavors is the presence of poor management practices. This deficiency extends across various dimensions, including planning, resource allocation, team coordination, and decision-making.

## 2 Primary causes of project failures

Source: PMI

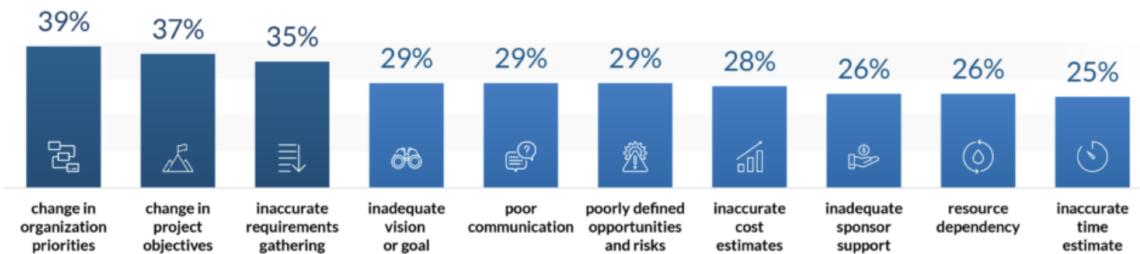


Figure 0.0.3 - Primary causes of project failures

Through a thorough analysis, it has been concluded that the stated problem belongs to the domains of Education and Entrepreneurship/Startup Management. Improper management has a trivial impact on both of these domains.

First of all, inadequate management of PBL projects can lead to reduced effectiveness in achieving learning objectives in the Educational field. If PBL projects are not well-structured or aligned with students' interests, they may not effectively ignite curiosity or encourage students to ask critical questions and seek answers. A study published in the "Journal of Educational Psychology" found that students who engaged in project-based learning experiences tailored to their interests demonstrated a 20% higher level of overall engagement compared to those in traditional classroom settings[10].

Moreover, a lack of clear goals is the most common factor (37%) for project failure[11]. When students have a clear idea of what they want to achieve, they are more likely to be motivated to work towards their goals. Setting goals provides a sense of purpose and helps students stay focused on their objectives, even when faced with challenges or setbacks.

Furthermore, inadequate management hinders the development of critical skills such as critical thinking, problem-solving, and effective communication. These skills are not only essential for academic success but also for future career readiness. Studies have shown that students engaged in well-structured PBL projects can experience improvements in those skills by as much as 20-30%.

In the Entrepreneurship/Startup Management field, when it comes to bringing a project to life, poor management practices can lead to failure to achieve milestones. Inefficient resource allocation, such as mismanaged budgets or misaligned team responsibilities, can lead to financial losses and hinder the growth and sustainability of startups. More than 38% of the projects fail because of ineffectively handled financial assets.

Looking at another statistic relating to time management, adequately defined roles and responsibilities are crucial to project success. If one person tries to do everything by themselves, you could see productivity drop by 40%[12]. Without effective management, team members may receive conflicting in-

structions or be tasked with priorities that are not well-aligned with the project's overall objectives. 38% of organizations believe that vagueness surrounding responsibilities is the biggest obstacle to a project's success[13].

Another consequence of poor project management is project schedule delays. Unclear tasks, conflicts, scope creep, etc. will all cause delays in the schedule. A realistic project schedule should be based on the scope of work, number of available resources, and productivity of each resource.

On the same note, poor management practices can suppress creativity and innovative thinking among teammates. A percentage of 69% of respondents of a survey by Wellingtone Project Management believed that poor project sponsorship and leadership were major obstacles to project innovation and success[14]. When there's a lack of encouragement for new ideas or a fear of failure, it can hinder the generation of innovative solutions. And even if innovative ideas are generated, poor management can result in a failure to effectively implement and scale these solutions.



Figure 0.0.4 - Reasons Why Projects Fail

Overall, the impact of poor management on both the Education and Entrepreneurship/Startup Management domains is substantial and can impede the achievement of intended goals and objectives within these fields. Effective management is essential for ensuring the long-term viability and sustainability of both educational initiatives and startups. Poor management may jeopardize the ability to maintain operations and achieve long-term success.

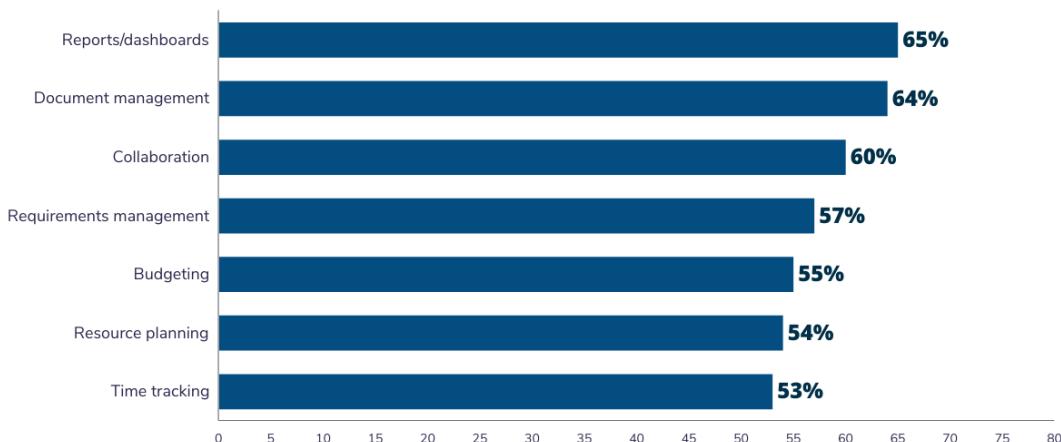
### Problem Statement

This analysis led to the following problem statement: more than half of the participants of innovation programs fail to successfully finish their PBL projects in educational and entrepreneurship settings, diminishing the effectiveness of PBL initiatives.

## Proposed Solution

In the dynamic landscape of project-based learning, success hinges on a well-defined roadmap and effective management. To address this imperative, the concept of BlueProject has been developed. BlueProject aims to be a comprehensive solution that seamlessly integrates key components for a thriving learning environment.

## Most-used PM tool features



Source: Capterra Project Management User Survey 2021  
Q: Please select the statement that best applies to each of the following project management software features.  
A: I have this feature, and use it  
n: 422



Figure 0.0.5 - Most Used Project Management Software Features

BlueProject is a concept of an online web application, available on computers, that can be accessed anytime, anywhere. This approach is designed to empower students, instructors, and advisors by streamlining critical aspects of project management and fostering collaborative engagement. With a focus on clear objective setting, requirements management, resource planning, progress tracking, post-project sustainability, analytics and reporting, and community engagement, this solution has the potential to revolutionize the educational experience.

Positioned at the forefront of educational innovation, the concept of BlueProject offers a tailored solution designed to elevate project-based learning management. At its core, BlueProject has a progress monitoring feature that provides a dynamic visual dashboard, overseeing project goals transformed in milestones, balanced task assignment, respected deadlines, and facilitating seamless mentor feedback exchange. This indispensable tool ensures unwavering project focus and punctual completion.

BlueProject addresses critical needs by guiding projects, ensuring timely intervention, optimizing resource allocation, enabling informed decision-making, and facilitating performance assessment. Without

Without this robust progress monitoring, projects are prone to delays and lack of direction. BlueProject sets a new standard for project-based learning, ensuring projects not only progress but thrive.

BlueProject is designed to be a web application based on compelling insights from Amazon Web Services[14]. Their research underscores the advantages of web apps - they are not only more straightforward, but also cost-effective and quicker to bring to fruition. This efficiency translates to a shorter time to market, due to the streamlined app development process. Additionally, web apps boast simplified maintenance protocols, as they operate off a singular codebase, reducing the need for extensive testing and updates. In contrast, native apps demand a more substantial financial commitment.

### **Functionality and advantages**

As a web application, the system's functionality and the advantages that it presents are the following:

1. To register, users create a profile and receive personalized onboarding based on their roles and objectives. This addresses the process of creating teams which can be a meticulous and boring one, causing a delay in getting started. The benefits include that users are seamlessly onboarded with a personalized experience. This ensures that individuals, whether students, advisors, or instructors, are equipped with the tools and information they need to maximize their potential within the platform.

2. To initiate a project, participants create project profiles, outlining objectives, requirements, and resources needed, indicating their role (student, advisor, instructor, etc.). This addresses the problem that many projects lack clear objectives, requirements, and structured foundations. The benefits include that participants kickstart their projects with clarity and precision. They outline their objectives, requirements, and resource needs, providing a structured foundation for success. Advisors and instructors then review and offer valuable feedback, setting the project on the right course.

3. To encourage a collaborative work environment, users following a PBL curriculum work on tasks with real-time collaboration features while advisors monitor progress and provide guidance. This addresses the problem that collaboration can be challenging in traditional settings and can affect the distribution of tasks, leading to an unbalanced workload. The benefits include that the platform provides a dynamic workspace where participants can work together on tasks. Real-time collaboration features facilitate seamless teamwork, allowing for the exchange of ideas, insights, and solutions. Advisors are also integrated into this environment, enabling them to monitor progress and provide timely guidance.

4. To facilitate progress monitoring, BlueProject's visual dashboard shows progress, highlighting completed milestones and upcoming deadlines. It also offers automated reminders for pending tasks. This addresses the problem of the lack of project tracking that leads to unclear progress and missed deadlines. The benefits include a clear and concise overview of project progress. Milestones are highlighted, and upcoming deadlines are prominently displayed. Automated reminders ensure that no task falls through the

cracks, keeping projects on track towards successful completion.

5. To stimulate post-project actions, participants can plan for project sustainability and participate in various innovation events, hackathons, and grant opportunities, all listed on the calendar page. If there aren't any plans at the moment, the project can be archived and students can return to it later. This addresses the problem that many projects end without consideration for their sustainability or further development. The benefits include that participants are guided in formulating plans for the sustainability and continued development or implementation of their projects, which encourages a forward-thinking approach, ensuring that the impact of the project extends beyond its initial phase.

6. To increase community engagement, participants engage in discussions, seek advice, and share experiences through forums and webinars. This addresses the problem that isolation and lack of discussion limit a learning environment. The benefits include that the platform fosters a vibrant community where participants can connect, share insights, seek advice, and engage in meaningful discussions. Forums and webinars provide spaces for collaborative learning and knowledge exchange.

7. To encourage feedback exchange and evaluation, BlueProject offer the possibility to create regular feedback loops for participants to reflect on the project and learning experience. This addresses the problem that the lack of structured feedback loops impedes project improvement. The benefits include the empowering of participants to reflect on their projects and learning experiences. This iterative process promotes continuous improvement, allowing individuals to refine their approaches and strategies for future projects.

### **Components and their benefits**

BlueProject's overall benefits include the enhancement of project success rates by providing structured guidance and oversight; improvement of critical thinking, problem-solving, and retention of information through effective project-based learning; fostering of a collaborative and supportive learning community; and enablement institutions and organizations to track the impact of PBL initiatives on performance and skill development. BlueProject consists of several components, which are:

1. The Dashboard: BlueProject's progress monitoring dashboard is a dynamic visual interface designed to provide users with a comprehensive overview of their project-based learning endeavors. It offers a dynamic milestone tracking system by transforming a project's goals into manageable milestones, providing a clear roadmap to achieving objectives. The easy assignment and distribution of tasks within each milestone ensures an equitable workload for team members. By gaining a transparent view of project deadlines, BlueProject ensures that tasks are completed on time and that project phases progress smoothly. It also facilitates smooth communication and feedback exchange between project participants and mentors, fostering continuous improvement using an instant messaging system. By

gaining insights into task distribution for efficient resource allocation, this concept enables adjustments to enhance project execution. The application evaluates each individual's and team's performance, providing valuable insights for mentorship and self-improvement, ultimately contributing to the project's success.

2. The Forum: BlueProject's forum provides a dynamic platform for users to engage in collaborative learning and knowledge exchange. Users can participate in organized discussion threads, facilitating insightful conversations and the sharing of valuable knowledge. As well, a user-friendly tool enables the creation and participation in surveys and polls. This feature empowers users to gather feedback, conduct research, and collectively make informed decisions. BlueProject offers a notification system that keeps users informed about relevant activities, ensuring they stay engaged and up-to-date with the latest discussions and surveys. User profiles showcase important information and engagement metrics, fostering a sense of community and recognizing active participants for their contributions. The ability to create and participate in surveys and polls empowers users to gather insights, make data-driven decisions, and collaborate effectively within the forum community. The forum includes tools for user moderation and content reporting, ensuring a respectful and constructive environment for all participants.
3. The Calendar of Events: BlueProject contains a dynamic events calendar which is a thriving hub designed to facilitate discovery, participation, and excellence in diverse innovative experiences. This feature encourages the exploration of tech expos, innovation summits, and startup showcases. It facilitates the diving into interactive sessions, tackling challenges in blockchain, AI, and the gaining of crucial insights into industry trends and practices shaping the future. By supporting the joining of startup schools for practical skills in product development and market strategies, project participants are ensured to never miss a learning opportunity. This way, their profiles will highlight active contributors, fostering a sense of belonging and connection. This feature will encourage a respectful and supportive environment with moderation tools in place.

### User story

As a user, the features mentioned above act as a central hub for managing project-based learning. They provide a clear and actionable view of project progress. To illustrate, an example of how users can interact with them will be provided next.

Meet Sarah, a dynamic university student with a passion for entrepreneurship. Sarah is enrolled in an entrepreneurship program, and her journey from innovative concept to successful completion is seamlessly guided by BlueProject, an application designed to support and enhance the entrepreneurial experience.

Sarah's adventure begins as she logs into the application using her university credentials and selects

her role as a student. Eager to bring her startup idea to life, she initiates a project and is led through a step-by-step process by the platform. Setting clear objectives, defining requirements, and allocating resources become a purposeful and productive exercise with the guidance of BlueProject.

Professor Johnson, an experienced advisor and educator, plays a crucial role in Sarah's entrepreneurial journey. As Sarah's advisor, he receives a notification to review and provide feedback on her project profile. Professor Johnson offers valuable insights and suggests additional requirements, ensuring a comprehensive and well-defined project scope.

With objectives and requirements finalized, Sarah ventures into the collaborative work environment. She invites two of her classmates, John and Emily, to join the project team. BlueProject's resource management dashboard proves instrumental as Sarah assigns tasks based on her team members' strengths and availability, maintaining a balanced workload for all.

The project progresses seamlessly, thanks to the platform's real-time collaboration features. Sarah and her team work on tasks efficiently, aided by automatic reminders for upcoming deadlines. Upon successful completion of the project, BlueProject prompts Sarah to set a post-project action plan. She decides to explore funding opportunities and partnerships to further develop her startup.

Sarah engages with the platform's community forum to share her experience and seek advice on funding strategies. Meanwhile, Professor Johnson, logged into BlueProject as an instructor, observes Sarah's progress. He appreciates the real-time collaboration features and uses the resource management dashboard to ensure a balanced workload for the team.

As the semester concludes, Sarah and her team receive a detailed analytics report showcasing the project's impact on their skills and performance. Professor Johnson reviews the report for assessment purposes, providing constructive feedback for future projects. Together, Sarah and Professor Johnson exemplify the successful synergy between a motivated student and an experienced educator, facilitated by the comprehensive support of BlueProject.

### **Value Proposition canvas**

To strengthen this scenario, in Figure 0.0.6, it is explored the Value Proposition Canvas, a powerful tool used to design and refine products or services. This canvas provides a structured framework to understand the needs of the customers and how the application's offering fulfills those needs.

In the analysis of the Value Proposition Canvas, there are explored two key components: the Customer Profile and the Value Map. In the customer profile segment, BlueProject caters to a diverse range of users, including students engaged in Hackathons and Bootcamps, as well as professors and mentors guiding the development of Project-Based Learning (PBL) initiatives.

# The Value Proposition Canvas

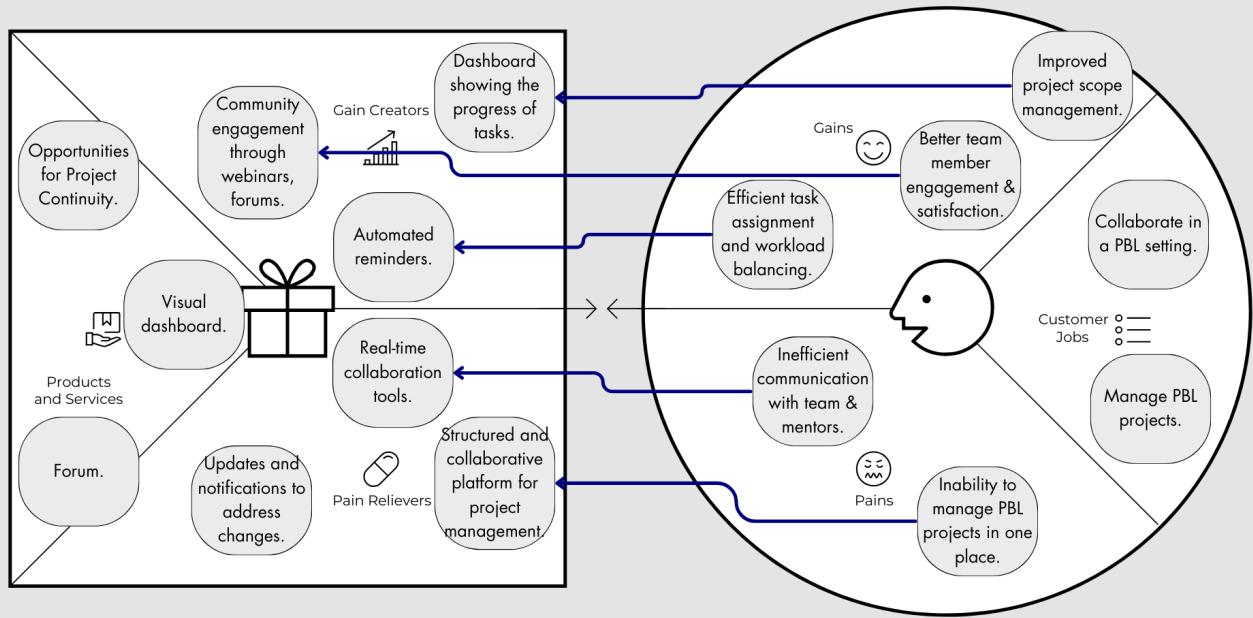


Figure 0.0.6 - Value Proposition Canvas

The customer jobs include the effective management of PBL projects and seamless collaboration in a PBL setting.

The customer gains encompass the achievement of efficient task assignment and workload balancing, leading to improved team member engagement and satisfaction, as well as enhanced project scope management.

The customer pains include challenges such as the inability to manage PBL projects in one centralized location and encounter inefficiencies in communication with team members and mentors.

BlueProject strategically addresses these diverse needs through well-thought-out features and services described in the value map.

The gain creators include a user-friendly dashboard that offers a clear view of task progress. Additionally, there are community engagement through webinars and forums and automated reminders for important project milestones.

To alleviate common pain points, the pain relievers include real-time collaboration tools, a structured and collaborative platform for project management, and the assurance of timely updates and notifications to address any changes promptly.

The product and services of BlueProject offer a visual dashboard for transparent project tracking, a forum where people can get engaged in relevant discussions, and opportunities for project continuity to ensure projects are on track and successful.

In alignment with its commitment to educational excellence, BlueProject's value proposition is articulated through the seamless integration of these features: BlueProject assists educational institutions and individuals in managing PBL initiatives by offering a web application with a visual dashboard for real-time collaboration, a forum to gain insights about PBL management, and a calendar with opportunities for project continuity.

## **Target Group and Customer Validation**

In the quest to revolutionize education and project management, it is imperative to identify and understand the diverse groups of individuals who stand to benefit from our innovative solution. These distinct segments, united by shared challenges, represent our potential target groups.

Each of these groups grapples with specific problems in their educational or professional journeys. Whether it's the ambitious student seeking to excel in complex projects, the mentor aiming to guide and monitor student endeavors, or the entrepreneur balancing academia with startups, BlueProject aims to provide tailored solutions.

The first group BlueProject addresses to are participants who are simultaneously taking part in entrepreneurial activities/hackathons and often need a streamlined project management tool to organize tasks, assign responsibilities, and track progress without the complexity of larger enterprise solutions.

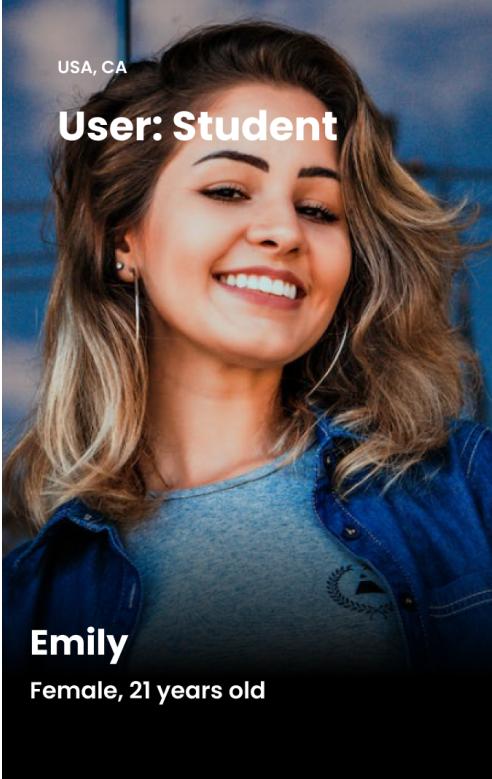
The second group BlueProject addresses to are students following a PBL curriculum, often struggling with managing projects efficiently. They tend to procrastinate and find it challenging to engage with academic tasks. They need a platform that helps them organize tasks, collaborate effectively, and receive timely feedback.

The third group BlueProject addresses to are professors and mentors who often face the challenge of effectively guiding and monitoring student projects. They require a tool that streamlines the process, tracks progress, and facilitates seamless communication with students.

In the Educational and Startup Management landscape, we encounter three distinct personas: Emily, the Ambitious Student; Bob, the Procrastinating Student; and Professor Durden, the Supportive Mentor. Each possesses unique needs and goals. These personas reflect the needs of our target group, and our platform caters to their individual requirements for an enriched learning experience.

## User Persona 1: Emily

Meet Emily - a high-achieving university student who constantly takes part in different educational bootcamps and hackathons. She is passionate about her studies and always looks out for new opportunities. Emily strives for excellence in her activities and seeks challenges that push her boundaries. She is looking for a platform that can help her organize her complex projects effectively during hackathons and bootcamps. She needs a solution that allows her to collaborate with peers, manage tasks efficiently, and receive timely feedback from mentors, but with the possibility to make this asynchronously. Emily's goal is to excel in her projects and gain practical skills that will prepare her for the competitive tech industry.



USA, CA

**User: Student**

**Emily**  
Female, 21 years old

**Success is the sum of small efforts repeated day in and day out. ,,**

**Background**

Emily is a high-achieving university student majoring in computer science. She's passionate about her studies and seeks challenges that push her boundaries. Emily constantly takes part in Hackathons and Startup Development Programs.

Goals and Needs	Behaviors	Frustrations
Emily's primary goals are to excel in her projects and gain practical skills that will prepare her for the competitive tech industry.  She needs a platform to effectively manage her complex projects and collaborate with peers and mentors asynchronously.	Actively participates in tech related extracurricular activities.  Sets ambitious goals for each project and follows a structured approach to achieve them.	Lack of a centralized project management solution.  Inefficient communication with team members and mentors.

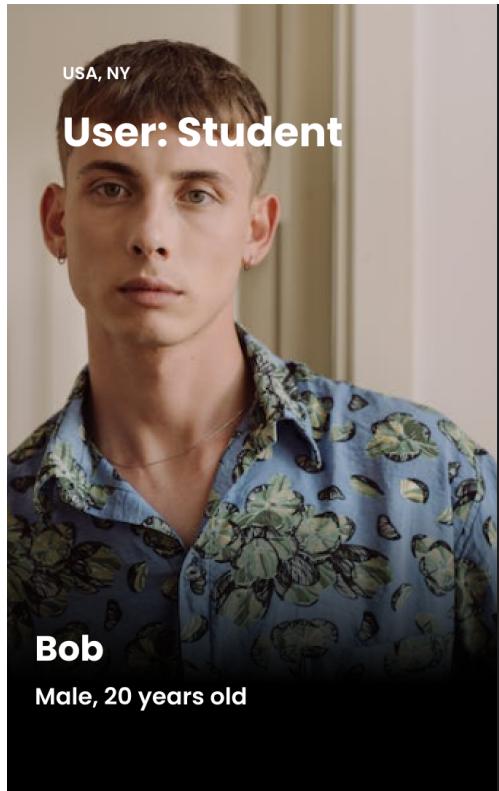
Figure 0.0.7 - User Persona: Emily

## User Persona 2: Bob

Meet Bob, the Procrastinating Student. Enrolled in an economics program, Bob lacks enthusiasm for academics and often procrastinates on assignments. Despite recognizing the need to pass, his interests lie outside studies—socializing, gaming, and hobbies.

Bob is seeking a platform primarily due to his lack of motivation and tendency to procrastinate. He

desires a solution that caters to his laziness by simplifying the management of academic tasks, and breaking down assignments into the smallest possible responsibilities. Bob's main goal is to save time and effort, as he has limited interest in academic projects and does not want to invest energy in understanding project structures. The platform should serve as a quick escape from his duties, providing concise instructions and minimalistic interactions, allowing him to fulfill his minimal responsibilities effortlessly.

A composite image showing a portrait of a young man named Bob on the left and his user persona details on the right. The portrait shows Bob from the chest up, wearing a blue floral button-down shirt. He has short brown hair and a small hoop earring. The background is a plain, light-colored wall.

USA, NY

**User: Student**

**Bob**  
Male, 20 years old

**Why do today what you can put off for tomorrow? „**

**Background**

Bob is a university student enrolled in an economics program. He lacks enthusiasm for academic studies and often procrastinates on assignments and projects.

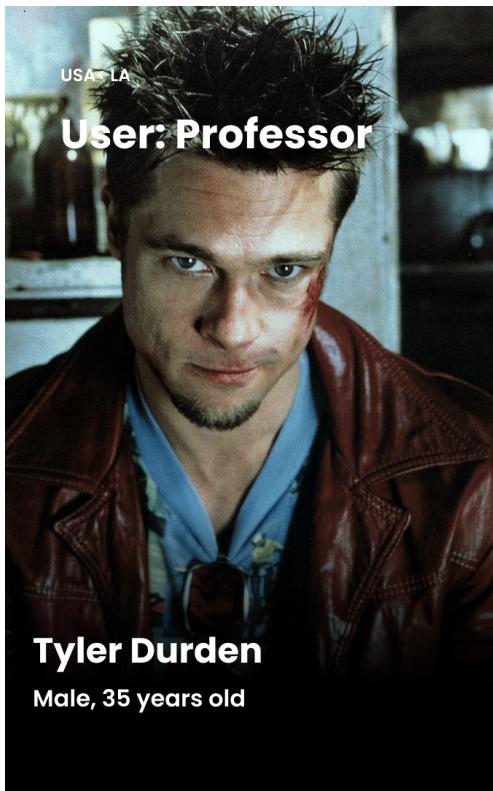
Goals and Needs	Behaviors	Frustrations
Bob's primary goal is to save time and effort while fulfilling his minimal academic responsibilities.	Enjoys socializing with friends and online gaming.	Lack of motivation for academic studies.
Bob needs a platform that simplifies the management of academic tasks and provides concise instructions and minimalistic interactions.	Prefers hobbies and interests outside of academics.	Tendency to procrastinate on assignments and projects.
	Looks for shortcuts to complete academic tasks quickly.	Desire to minimize effort in academic tasks.

Figure 0.0.8 - User Persona: Bob

### User Persona 3: Professor Durden

Meet Professor Durden, the Supportive Mentor. With years of experience in teaching computer engineering, he is dedicated to nurturing the potential of his students and believes in the power of hands-on learning experiences. He mentors students in various projects and research initiatives.

Professor Durden is searching for a platform that simplifies the process of guiding and monitoring student projects. He requires a tool that allows him to track project progress, provide constructive feedback, and facilitate seamless communication with students. His goal is to enhance the quality of education by empowering students with effective project management tools. Sometimes he forgets that he doesn't have infinite time in a day and can take too much responsibility over time. Still, he is confident that with proper management is possible to take care of all his endeavors.



**Education is not the filling of a pail, but the lighting of a fire.** „

#### Background

Professor Durden is a seasoned educator with years of experience in teaching computer engineering. He is dedicated to nurturing the potential of his students and believes in the power of hands-on learning experiences. He mentors students in various projects and research initiatives.

Goals and Needs	Behaviors	Frustrations
Professor's Durden primary goal is to enhance the quality of education by guiding and monitoring student projects effectively.	Actively mentors students in various projects and research initiatives.	Occasional time management challenges due to a heavy workload.
He needs a platform to simplify the process of managing student projects, track progress, provide constructive feedback, and facilitate seamless communication.	Balances teaching and research.  Believes in the importance of practical, hands-on learning experiences.	Need for an efficient project management tool.

Figure 0.0.9 - User Persona: Professor Durden

These carefully crafted user personas, representing a diverse range of individuals, offer a vivid snapshot of the unique needs, aspirations, and challenges that students and mentors face. Emily, the Ambitious Student, exemplifies the drive for excellence and the pursuit of practical skills. Bob, the Procrastinating Student, embodies the struggle with motivation and the need for simplified academic management. Professor Durden, the Supportive Mentor, stands as a pillar of guidance, dedicated to empowering students through hands-on learning experiences.

#### Hypotheses and questions

The needs of the users have been carefully studied and based on them, it has been created specific hypotheses and questions for three different types of users: Emily, Bob, and Professor Durden. These hypotheses are like guidelines that direct the development of features and functions that will help each user succeed.

1. If Emily uses BlueProject to collaborate effectively, manage tasks, and receive timely feedback, then her project excellence and practical skill development will improve.

Emily, a driven academic, aspires to excel in her projects and develop practical skills crucial for the competitive tech industry. The hypothesis posits that Emily will utilize BlueProject to optimize collaboration, task management, and feedback reception. This raises pivotal questions: What tools or features could have elevated her experience? Were there situations where enhanced collaboration was

needed but not immediately apparent?

In crafting the platform to align with Emily's high standards, we ensure that BlueProject becomes an indispensable ally in her academic pursuits. By providing tools that seamlessly integrate with her workflow, we create an environment where Emily can fully leverage her potential and achieve remarkable results.

2. If Bob uses BlueProject to simplify academic task management by breaking down assignments into manageable steps, then he will reduce his tendency to procrastinate, ultimately saving time and effort. Bob's academic journey is marked by a familiar adversary: procrastination. Recognizing this challenge, the hypothesis asserts that BlueProject will empower Bob by simplifying task management, breaking down assignments into manageable steps, and ultimately saving him time and effort. This leads us to inquire about the aspects of a tool that could make Bob's responsibilities easier to handle. Additionally, we explore features that might assist him in approaching assignments more effectively. Through an intuitive platform design that minimizes cognitive load and offers concise instructions, we aim to provide Bob with a seamless experience. By mitigating his tendency to procrastinate, BlueProject becomes the catalyst for his academic success.
3. If Professor Durden uses BlueProject for mentorship, then student project outcomes will improve compared to previous methods of mentorship.

Professor Durden, an experienced educator, plays a pivotal role in shaping the academic journeys of his students. The hypothesis proposes that BlueProject will serve as an invaluable tool for him, enabling him to track project progress, offer constructive feedback, and facilitate seamless communication. This prompts us to consider features that enhance mentorship and align with his unique mentoring style.

By equipping Professor Durden with the resources he needs to nurture his students' potential, BlueProject elevates the quality of education he provides. Through streamlined project tracking and feedback provision, the platform becomes an extension of his mentorship, fostering an environment of growth and excellence.

BlueProject's tailored hypotheses and thoughtful questions exemplify our commitment to understanding the unique needs of our users. By crafting a platform that aligns with Emily's pursuit of excellence, Bob's battle against procrastination, and Professor Durden's dedication to mentorship, we empower each user to reach their full potential. Through this personalized approach, BlueProject emerges as a transformative force in the realm of academic project management, redefining how individuals engage with their academic pursuits.

HYPOTHESES	QUESTIONS	ARGUMENTS
If Emily uses BlueProject to collaborate effectively, manage tasks, and receive timely feedback, then her project excellence and practical skill development will improve.	<ul style="list-style-type: none"> <li>Reflecting on your recent projects, can you think of any tools or features that might have enhanced your experience? What would they have been, and how might they have helped?</li> <li>When collaborating with peers, were there any situations where a particular feature could have improved the process, even if it wasn't immediately obvious?</li> <li>How do you generally prefer to receive feedback on your projects?</li> </ul>	Understanding Emily's passion for excellence allows us to develop features that align with her high standards, ensuring that the platform empowers her to excel in her projects and gain practical skills for the competitive tech industry. By providing tools that meet her high standards we create an environment where she can fully leverage her potential and achieve remarkable results in her academic pursuits.
If Bob uses BlueProject to simplify academic task management by breaking down assignments into manageable steps, then he will reduce his tendency to procrastinate, ultimately saving time and effort.	<ul style="list-style-type: none"> <li>Picture a tool that effectively supports you in managing your academic tasks. What aspects of this tool might make your responsibilities easier to handle?</li> <li>When breaking down a large assignment, are there any features that might help you approach the task more effectively?</li> <li>Consider an interface that genuinely captivates you. What elements might draw you in and keep you engaged?</li> </ul>	Recognizing Bob's tendency to procrastinate highlights the need for a user-friendly platform with features that simplify tasks and provide clear guidance. This ensures that Bob can overcome procrastination and efficiently complete assignments. By designing an intuitive platform that minimizes cognitive load and offers concise instructions, we create a space where Bob can navigate his academic responsibilities with ease.
If Professor Durden uses BlueProject for mentorship, then student project outcomes will improve compared to previous methods of mentorship.	<ul style="list-style-type: none"> <li>As you reflect on guiding student projects, are there features or functionalities that might enhance your mentorship?</li> <li>When giving feedback, is there a method or tool that might align with your mentoring style?</li> <li>Envision your ideal project management setup. What elements might assist you in saving time and increasing effectiveness?</li> </ul>	Learning about Professor Durden's dedication to guiding and monitoring student projects allows us to create features that facilitate effective mentorship. This ensures that the platform empowers him to support his students and enhance the quality of education. By providing tools that streamline project tracking, feedback provision, and seamless communication, we equip Professor Durden with the resources he needs to nurture his students' potential and elevate the educational experience.

Figure 0.0.10 - Hypotheses and Questions

## **Business Model and Funding Strategy**

BlueProject stands at the forefront of educational transformation, aiming to revolutionize the learning experience through its dynamic Project-Based Learning (PBL) management platform.

To help students who may be struggling financially, BlueProject employs a pricing model that offers a combination of free and paid services. This decision stems from a commitment to inclusivity, ensuring that the platform remains accessible to a wide spectrum of users, regardless of economic circumstances. By offering a free trial with essential features, BlueProject addresses the needs of students who may be financially constrained, thus democratizing access to quality education.

BlueProject's free trial lays a solid foundation for learners to embark on their project-based learning journey. These features offer essential tools to facilitate collaboration, engage in meaningful discussions, and receive constructive feedback:

1. Users create profiles and receive basic onboarding tailored to their roles and objectives.
2. Participants outline project objectives, requirements, and resource needs, providing a structured foundation for their projects.
3. BlueProject offers a dynamic workspace where participants can collaboratively engage in tasks, facilitated by real-time collaboration features.
4. Users are encouraged to partake in discussions, seek guidance, and exchange experiences through the platform's forums and webinars.
5. To support the accessibility of BlueProject's free trial, advertisements are strategically integrated into the platform. These ads are thoughtfully placed to ensure they do not disrupt the learning process. The revenue generated from these ads contributes to the platform's sustainability and allows us to continue offering valuable services to a wider audience.

For learners seeking an elevated learning experience and advanced tools, BlueProject offers a Pro trial that unlocks a range of premium features. These features are designed to enhance the learning journey and provide a more comprehensive set of resources:

1. Pro users benefit from increased storage capacity, allowing for the efficient organization and management of project-related documents and resources.
2. Pro users can manage multiple projects concurrently within the platform. This feature is particularly valuable for individuals or teams working on a portfolio of projects, allowing for efficient oversight and coordination across various initiatives.
3. Pro users enjoy additional features such as private discussion groups.
4. Pro users have priority access to a diverse range of events, workshops, webinars, and entrepreneurial education opportunities, ensuring they stay at the forefront of industry trends and practices.

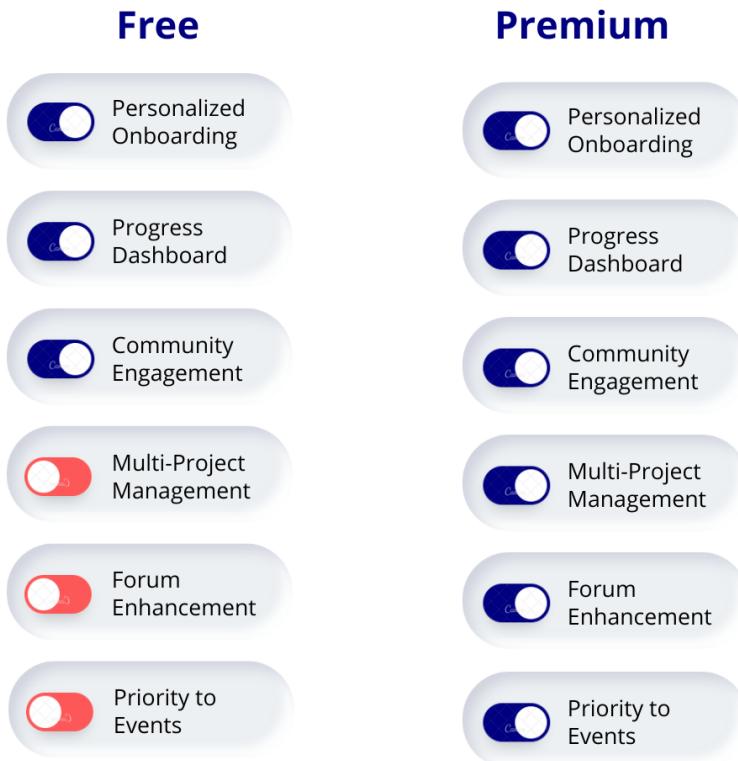


Figure 0.0.11 - Free vs Paid Features

To set the wheels in motion, the founders and initial stakeholders will infuse personal capital into the venture. This seed funding will kickstart operations, enabling the development of a minimum viable product (MVP) and early-stage operations. The revenue strategy is designed to be comprehensive and adaptable. It is planned to implement product-led growth, optimizing the offerings for user acquisition and retention. Simultaneously, the focus will be on SEO and social media marketing to increase online visibility. Additionally, the company will seek support from angel investors and venture capital firms, recognizing the pivotal role they play in accelerating product development and expanding the team.

BlueProject will actively pursue grants and participate in innovation competitions focused on education and technology. Beyond financial support, these opportunities offer a platform to showcase the company's vision and capabilities, fostering credibility and recognition within the education and tech communities.

Embracing a freemium pricing model, BlueProject ensures accessibility for a wide user base while generating revenue from early stages. Basic features will be accessible for free, while premium functionalities will be offered at a modest subscription fee of \$4.99 per month. This balanced approach creates a steady stream of income, facilitating ongoing development and refinement of the platform.

Collaboration lies at the heart of BlueProject's strategy. The company will actively seek partnerships

with educational institutions, edtech accelerators, and key players in the education sector. These alliances may involve co-developing tailored solutions, joint marketing efforts, or even investment opportunities. By leveraging the collective expertise and networks of partners, BlueProject aims to amplify its impact on education.

Overall, BlueProject's funding strategy is designed to be agile and adaptive, allowing the company to respond to market dynamics and evolving user needs while staying true to its mission of transforming education through Project-Based Learning. By combining various funding sources and maintaining a customer-centric approach, BlueProject aims to secure the resources needed for long-term success and impact.



Figure 0.0.12 - Freemium Business Model

## **Comparative Analysis**

Effective management and a well-defined plan are crucial in project-based learning to guarantee success. With a focus on clear objective setting, collaborative engagement, and structured progress tracking, BlueProject redefines the educational experience. When presented with a multitude of options, such as Trello, Notion, and ClickUp, the need for a structured approach becomes paramount. This is where a comparative analysis steps in, offering a comprehensive framework for evaluating and contrasting these prominent solutions. In the subsequent paragraphs, we will examine why Blue Project stands out as a top contender and has the potential to redefine project-based learning management.

One of the standout features of BlueProject is its progress monitoring dashboard. While one might argue that all of our concurrents offer this feature, BlueProject's dashboard easily stands out. This visual tool provides a clear view of project progress by breaking down goals into manageable steps. It operates as a reliable guide that steers projects through tasks and deadlines, while also ensuring balanced work distribution among team members. The tool is robust and ensures focused progress, leading to timely completion – a crucial aspect often overlooked in traditional project management. In contrast, Trello provides a simple card-based system for task management, and Notion [17] offers a customizable dashboard for tasks, notes, and documents. ClickUp [18] features a detailed and customizable dashboard that surpasses the reporting capabilities of Trello [16] and Notion by providing an overview of tasks, projects, and team activity. Jira [19] and Asana [22] offer a comprehensive dashboard, but lack specific educational-oriented tools. Therefore, none of these three platforms specialize in project-based learning. While all are great for basic task management, they lack our platform's advanced features.

Feedback and evaluation are other features that make our platform the best option for project management. Notion provides the tools for setting up feedback mechanisms, the implementation may require manual setup and customization based on specific needs. Trello and ClickUp offer feedback through comments on tasks/cards. Both Jira and Asana handle feedback through comments and discussions, allowing users to provide input, updates, and collaborate within the context of tasks or issues. BlueProject, however, stands out by placing a strong emphasis on feedback and evaluation within its platform, specifically tailored to educational projects. It offers dedicated features for users to provide feedback, evaluate progress, and assess project outcomes. This includes structured feedback forms, evaluation rubrics, and tools for participants to reflect on their own learning experiences.

Regarding the clear objective setting, BlueProject is yet again the leader. To put it more precisely, it is the only platform that provides this particular feature. This comprehensive approach ensures that projects kickstart with clarity and precision, addressing the common issue of projects lacking clear objectives and foundations. In comparison to competitors like Notion, Trello, ClickUp, Jira, and Asana, while they do

offer customizable goal-setting, they do not provide the same level of structured guidance and emphasis on objective clarity that BlueProject offers. BlueProject's dedication to this critical aspect of project management is what truly sets it apart. This feature empowers teams and individuals by providing a clear roadmap and a defined sense of direction, ultimately leading to more successful project outcomes.

Community engagement is next on the agenda. Notion and Trello offer basic collaboration features where users can invite others to collaborate on tasks, and leave comments, but neither has advanced community engagement tools like discussion boards or forums. ClickUp provides more comprehensive collaboration features like activity feeds to keep team members updated on project progress. Jira and Asana are strong in general collaboration but lack specific educational focus and community-building features. Once again, BlueProject takes the lead. It provides specialized features for users to interact, share insights, and collaborate seamlessly. Beyond basic task and project management, BlueProject offers a space for participants to engage, discuss, and co-create knowledge. This makes BlueProject uniquely suited for educational projects where community-building is crucial.

When it comes to role-based onboarding, BlueProject strikes once again. The only other platforms that offer this feature is ClickUp, Jira and Asana, where you can manually create new roles and assign them to your team. Notion and Trello only offer basic permissions settings that allow administrators to control who can view, edit, and comment on the workplace.

Last but not least is the post-project continuity feature. Teams can utilize ClickUp, Notion, Trello, Jira, and Asana to archive their work, but these tools do not offer any other functionalities beyond that. However, BlueProject gives significant importance to the actions taken after the completion of the project. It offers dedicated features to ensure that project-related resources, documents, and information are preserved and accessible even after the project's completion. Additionally, participants are guided in formulating plans for the sustainability and continued development or implementation of their projects. This step encourages a forward-thinking approach, ensuring that projects not only reach completion but also have a roadmap for ongoing impact and growth. Furthermore, BlueProject provides a dynamic calendar for events. This feature enhances the collaborative nature of the platform, allowing participants to seamlessly transition from one project to the next, fostering a continuous learning experience.

All these points make BlueProject the superior choice for institutions and individuals seeking a tailored solution for effective project management in the educational realm. With its comprehensive suite of tools and a keen focus on educational objectives, BlueProject paves the way for transformative learning experiences and enduring project success.

## COMPARATIVE ANALYSIS

PLATFORM FEATURES	BLUE PROJECT	NOTION	TRELLO	CLICKUP	ASANA	JIRA
ONLINE WEB APPLICATION	✓	✓	✓	✓	✓	✓
PROGRESS MONITORING DASHBOARD	✓	✓	✓	✓	✓	✓
FEEDBACK AND EVALUATION	✓	✓	✓	✓	✓	✓
CLEAR OBJECTIVE SETTING	✓	✗	✗	✗	✗	✗
COMMUNITY ENGAGEMENT	✓	✗	✗	✗	✓	✓
ROLE-BASED ONBOARDING	✓	✗	✗	✓	✓	✓
POST-PROJECT ACTIONS	✓	✗	✗	✗	✗	✗

Figure 0.0.13 - Comparative Table

### SWOT Analysis

The SWOT analysis presented here evaluates the strengths, weaknesses, opportunities, and threats associated with the innovative PBL (Problem-Based Learning) management platform. BlueProject represents a significant advancement in educational technology, designed to enhance the management of PBL projects across various educational settings. By examining its internal attributes and external challenges, this analysis aims to provide a comprehensive overview of the platform's current position in the market.

BlueProject exhibits a range of strengths that position it as a robust solution for Project-Based Learning (PBL) management. Its extensive feature set addresses diverse needs within the PBL domain, providing a comprehensive toolkit for efficient project management. The platform's intuitive design and user-friendly interface contribute to its accessibility, ensuring widespread adoption across various user demographics.

<b>Strengths:</b>	<b>Weakness:</b>
<ul style="list-style-type: none"> <li>• Comprehensive functionality</li> <li>• User-friendly interface</li> <li>• Customizability</li> </ul>	<ul style="list-style-type: none"> <li>• Initial learning curve</li> <li>• Technical Issues</li> <li>• Limited accessibility</li> </ul>
<b>Opportunities:</b>	<b>Threats:</b>
<ul style="list-style-type: none"> <li>• Market expansion</li> <li>• Continuous improvement</li> <li>• Partnerships</li> </ul>	<ul style="list-style-type: none"> <li>• Competitive landscape</li> <li>• Insufficient funding</li> <li>• Dependency on third-party services</li> </ul>

Figure 0.0.14 - SWOT Table

A notable strength lies in BlueProject's adaptability, allowing users to tailor the platform to the specific requirements of their projects. This flexibility accommodates various types of PBL initiatives, thereby enhancing the platform's versatility and applicability.

Nevertheless, like any complex system, BlueProject is not without its weaknesses. Some users may encounter a learning curve when familiarizing themselves with the platform, potentially leading to resistance to change. Furthermore, the presence of glitches and technical issues could disrupt the learning process, consequently impacting the overall user experience. Additionally, the platform's dependency on internet connectivity may pose challenges for users situated in regions with inadequate internet infrastructure.

Despite these challenges, BlueProject presents promising opportunities for growth and development. There exists significant potential to expand the platform's reach to a broader audience, encompassing different educational institutions and corporate training programs. The opportunity for ongoing enhancements and updates, driven by user feedback and emerging technologies, positions BlueProject for continuous improvement. Collaborations with educational institutions for research projects and joint initiatives further enhance the platform's credibility and relevance within the PBL landscape.

However, it is imperative to acknowledge potential threats to BlueProject's success. The presence of competing PBL management solutions necessitates constant innovation to maintain a competitive edge. Limited financial resources may impede the platform's ability to invest in necessary upgrades, effective marketing strategies, or robust user support, thereby impacting its overall competitiveness. Additionally, the reliance on external services or APIs introduces a potential risk, as any downtime, security breaches, or policy changes in these services could adversely affect BlueProject's functionality.

In navigating this dynamic landscape, BlueProject must strategically leverage its strengths, address

its weaknesses, capitalize on emerging opportunities, and proactively mitigate potential threats to ensure sustained success and relevance in the ever-evolving PBL ecosystem.

In conclusion, the SWOT analysis underscores the multifaceted nature of the BlueProject platform. Its comprehensive functionality and user-friendly interface position it as a versatile tool for diverse educational needs. The platform's customizability enhances its adaptability to different project types and settings. However, challenges such as the initial learning curve and potential technical issues necessitate careful consideration. Nevertheless, the identified opportunities for market expansion, continuous improvement, and strategic partnerships offer a promising trajectory for the platform's growth. By addressing potential threats through innovation and prudent resource allocation, the platform can fortify its competitive edge and continue to advance the landscape of educational technology.

# Midterm 2

## Idea Validation

BlueProject aims to continue its commitment to addressing the challenges associated with Project-Based Learning (PBL) and project management in the realms of Education and Entrepreneurship/Startup Management. To cater specifically to the unique requirements of the target demographic, three surveys have been systematically administered across distinct segments within the target group. These segments include students enrolled in a Problem-Based Learning (PBL) curriculum, participants in hackathons, and mentors providing guidance to PBL teams.

Hypothesis no.1 has been addressed in the form created for hackathon participants: if Emily, an active student who participates in hackathons, uses BlueProject to collaborate effectively, manage tasks, and receive timely feedback, then her project excellence and practical skill development will improve[19]. These survey insights offer a nuanced understanding of the hackathon participants' experiences[22].

Struggling with activities during hackathon projects is a common occurrence, as reported by the majority of the participants (80%). Specific challenges identified include time constraints (66.7%), communication within the team (40%), and idea generation (66.7%). Additionally, participants highlighted reduced motivation and difficulties in establishing team connections. The majority (40%) prefer using traditional pen and paper for task management, while digital tools like Trello, Asana, and Jira are favored by others. Although approximately 80% find these tools meeting their project management needs, dissatisfaction persists among 20%, primarily due to the absence of a platform consolidating all necessary features.

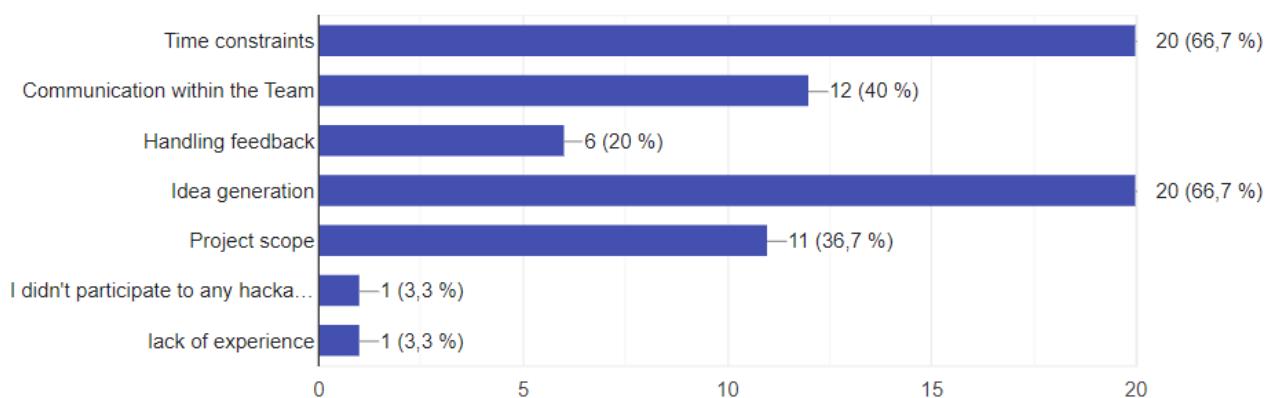


Figure 0.0.15 - Question: What specific challenges or difficulties do you typically encounter when working on hackathon projects?

Face-to-face meetings are deemed the most effective feedback method by over 73.3% of participants. Team deadline handling is precise for a majority (63.3%), while 66.7% express neutrality regarding how

platforms adjust to their schedules. Networking during a hackathon is considered very important by 60% of participants. Common post-hackathon practices include archiving projects for future reference (43.3%). Regarding the incorporation of a PBL project management platform during a hackathon, 56.7% express comfort with the idea, while 16.7% are neutral.

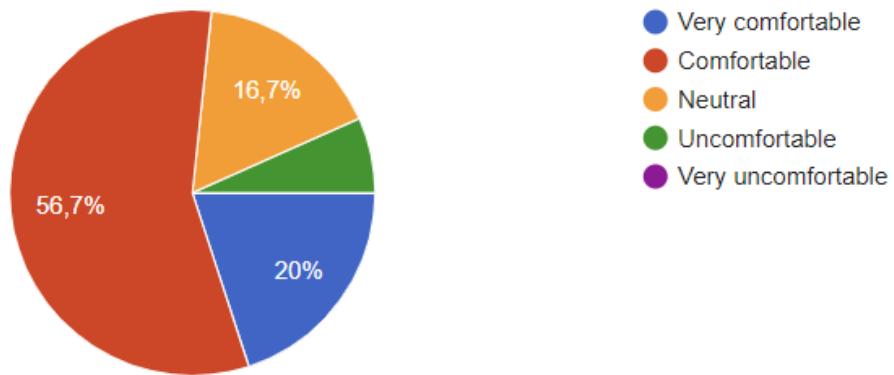


Figure 0.0.16 - Question: How comfortable would you be with incorporating a PBL project management platform during a hackathon?

Based on the analysis, it can be determined that hypothesis no.1 is invalidated. Even though people are open to using a new tool during the hackathons, the challenges reported during this type of event extend beyond the capabilities of BlueProject. This invalidation suggests a misalignment between participants' preferences and the proposed solution.

Hypothesis no.2 has been examined through the form created for students following a PBL curriculum: If Bob, a PBL student, uses BlueProject to simplify academic task management by breaking down assignments into manageable steps, then he will reduce his tendency to procrastinate, ultimately saving time and effort[21]. These survey insights offer a better understanding of the student's needs and experience[23].

The survey revealed that 38.1% of students rated their experience in PBL projects as a 3 (on a scale of 1 to 5), with 41.3% rating it a 4, and only 11.1% as a 5. In terms of struggling with activities, 30.2% reported "Often", and 41.3% reported "Sometimes". These statistics underline the intensity of the proposed problem and the imperative need for a solution. The challenges identified by students encompass various aspects, such as time management issues (74.6%), difficulty in task delegation and tracking (41.3%), lack of motivation and engagement (52.4%), and unclear project goals or objectives (54%). These challenges significantly impact student engagement, leading to lower grades, falling behind, and an overall less exciting experience.

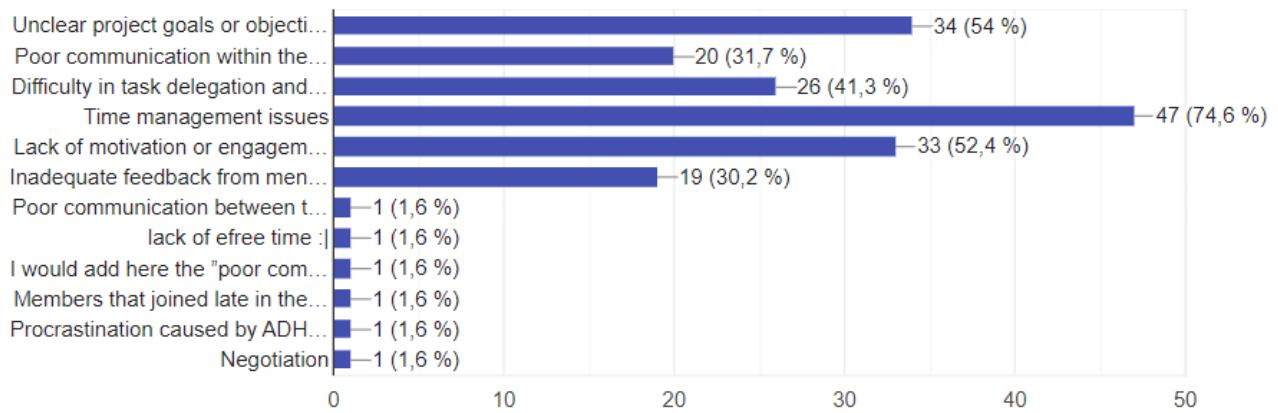


Figure 0.0.17 - Question: What specific challenges or difficulties do you typically encounter when working on project activities?

The dissatisfaction with PBL project management apps is notable, with 30.2% expressing discontent, primarily due to the absence of a platform that combines all their needs, thereby hindering their proficiency as they navigate between different apps. Turning to feedback mechanisms, over half of respondents find face-to-face meetings most effective. Regarding task breakdown into subtasks, over 30% consider it "somewhat easy", while 15% categorize it as "not easy". Approximately 40% of students seek inspiration from previous projects, resulting in 36.6% admitting to archiving their projects for future reference. To gauge the viability of a digital solution, respondents were asked about their comfort level in incorporating a PBL project management platform into their student role; 42.4% answered "comfortable", and 27.3% classified their opinion as "neutral".

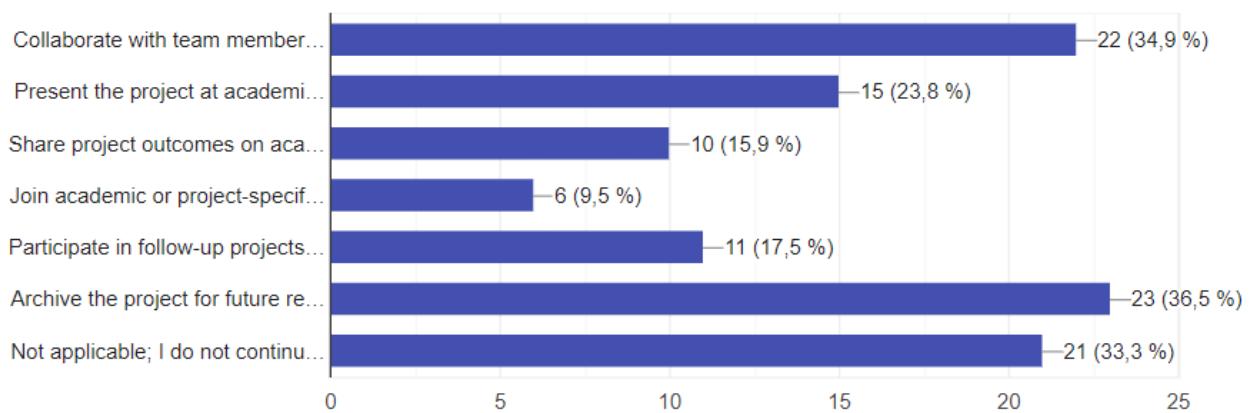


Figure 0.0.18 - Question: After completing a PBL project, how do you typically continue working on your projects?

The examination of Hypothesis no.2, validates the idea that the platform could simplify academic task management, reducing procrastination by saving time and effort. Survey insights highlight significant challenges. The data supports the need for a comprehensive solution like BlueProject, which aims to manage projects, track milestones, set deadlines, and receive feedback.

To gain valuable insights, hypothesis no.3 has been addressed in the form created for PBL mentors: if Professor Durden uses BlueProject for mentorship, then student project outcomes will improve compared to previous methods of mentorship[24]. The answers offer a better view upon the further development of BlueProject[25].

The mentors, by a margin of 61%, predominantly rated their overall experience a commendable 4 on a scale ranging from 1 to 5. A significant 83.3% observed challenges among team members directly linked to poor project management, highlighting the critical role effective management plays in the success of PBL projects. The unanimous response to the need for improved management practices in PBL projects underscores the collective acknowledgment of areas for enhancement. Among the challenging aspects of project management, mentors identified planning and organization, task delegation and tracking, and resource allocation as the most formidable, each garnering a 55.6% consensus.

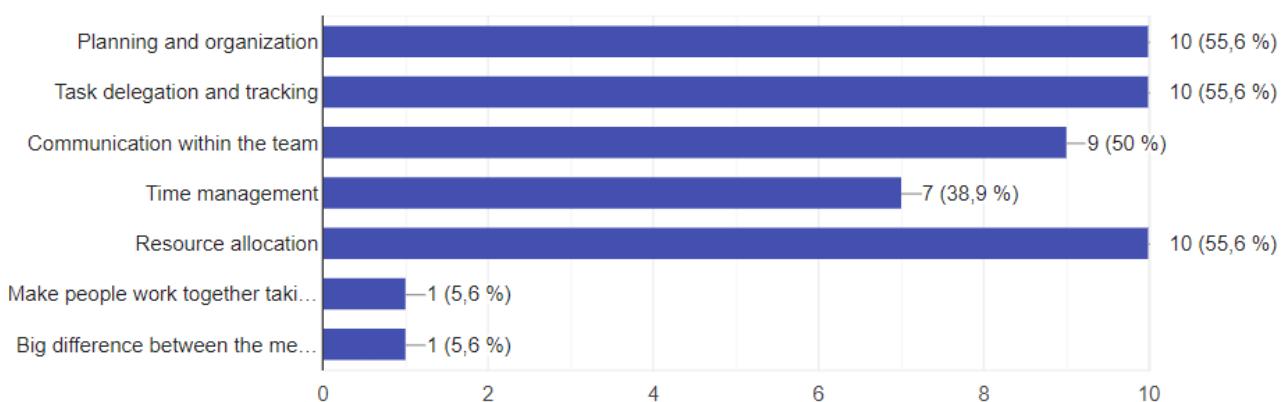


Figure 0.0.19 - Question: What aspects of project management do you find most challenging in your role as a mentor?

Utilization of project management platforms is prevalent, with 83.3% of mentors employing such tools. However, satisfaction levels reveal a nuanced picture, as only 44.4% felt that the platforms adequately met their mentoring needs. Improvement areas often revolved around information storage and communication features. Mentor feedback emerged as a crucial element, with 61.1% considering it very important and an additional 33.3% deeming it important for the success of a PBL project.

94.4% of mentors believe that a dedicated platform for project-based learning management could significantly enhance the exchange of feedback between mentors and individuals. Current methods of tracking progress and balancing workloads involve a mix of Excel sheets, Jira, scheduled meetings, and imparting time management skills. Evaluation spans learning outcomes, collaboration, communication, individual contributions, and the quality of the final product. Encouraging participants to reflect on their learning process further enriches the assessment criteria. The comfort level with incorporating technology into the mentoring role is notable, as 61.1% express being very comfortable with the idea.

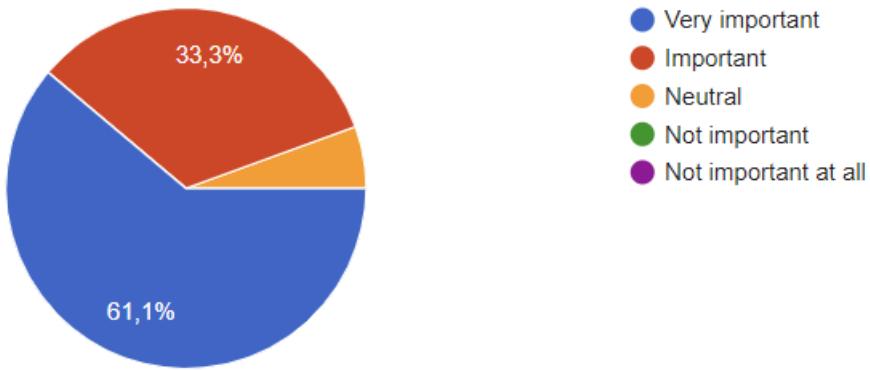


Figure 0.0.20 - Question: How important do you consider mentor feedback in the success of a PBL project?

The hypothesis that leveraging BlueProject for mentorship enhances student project outcomes is substantiated by survey findings. With 61% of mentors praising their experience, BlueProject emerges as a potential solution. The identified challenges, notably in planning, task delegation, and resource allocation, align with the platform's focus on effective project management. Although 83.3% use project management tools, the 44.4% satisfaction rate implies a need for improvement, indicating BlueProject could fill this gap. Mentor feedback's recognized importance and the desire for a dedicated platform underscore BlueProject's potential to significantly elevate PBL success by addressing critical mentorship needs. The positive response reinforces BlueProject's role as a viable solution for enhanced project outcomes.

In conclusion, the survey findings point towards a clear opportunity to enhance our application's effectiveness in supporting problem-based learning (PBL) implementation. While the positive survey responses are encouraging, there is room for improvement, especially in addressing the gaps identified in current project management tools. Therefore, it is recommended that to carefully consider the survey feedback, generate ideas for refinement, and implement necessary changes to ensure that BlueProject evolves to meet the evolving needs of mentors and learners engaged in PBL.

## Rethinking and Pivoting

With the gathered information, in the process of enhancing the BlueProject concept, a pivotal decision has been made: the realization that hackathon participants possess distinct requirements compared to Project-Based Learning (PBL) students and mentors led to the exclusion of the former from the target user group. To validate this strategic shift, a series of interviews has been undertaken[27].

The examination of insights from various hackathon participants, including Ana-Maria Brînză, Maxim Cernețchi, Nicolae Gherman, and Elena Graur, has uncovered crucial considerations for enhanc-

ing the BlueProject concept to better align with the dynamic and rapid nature of hackathon environments.

Ana-Maria Brînză emphasized the importance of a clear vision and tight deadlines in hackathons, elements that are not inherently addressed by BlueProject's more extended and ongoing nature. The platform's features, including profiles, real-time collaboration, and progress monitoring, may introduce overwhelming complexity for participants seeking streamlined and focused hackathon experiences.

Maxim Cernețchi's insights pointed to a potential misalignment with BlueProject's more intricate progress monitoring and milestone tracking. His preference for a straightforward task management system, coupled with the reliance on specific tools, indicates the need for BlueProject to offer a more simplified and streamlined task management interface. The platform's current emphasis on comprehensive features might hinder its compatibility with the simplicity and speed valued in hackathon environments.

Nicolae Gherman's perspective highlighted concerns with BlueProject's progress monitoring dashboard and the structured onboarding and team creation process. The extended nature of BlueProject's team organization may be perceived as time-consuming during hackathons, where swift progress tracking and team formation are crucial for success.

Elena Graur's insights further emphasized the misalignment with BlueProject's features. The structured approach, with milestones and task assignments, may not resonate well with the adaptable and fast-paced nature of hackathon projects. The platform's emphasis on forums and webinars, while valuable, might be considered too extensive for hackathon participants who often prioritize face-to-face discussions and quick exchanges.

In summary, the decision to exclude hackathon participants from the BlueProject target user group is a well-considered and strategic move, rooted in insights gathered from interviews with experienced hackathon participants. Their collective feedback has illuminated significant disparities between BlueProject's current extended and structured features and the preferences of hackathon participants, who prioritize a fast-paced and streamlined experience. This deliberate shift in focus towards optimizing BlueProject for PBL students and mentors underscores a commitment to tailoring the platform to the specific needs of educational environments like schools, colleges, universities, and educational bootcamps.

In response to survey feedback, a crucial decision has been reached: the dashboard will no longer include a chat function for communication among teammates and mentors. This adjustment aligns with the prevailing preference for face-to-face meetings as the primary mode of team collaboration. Instead, BlueProject now offers a calendar functionality, empowering teammates and mentors to schedule their potential meetings efficiently, which sends notifications whenever a change has been done.

Insights from an interview with Constantin Cazacu, a PBL mentor at the Technical University of Moldova, support this decision. Despite using online platforms like Teams for communication, Constantin emphasized a preference for in-person meetings, citing challenges in effective collaboration through digital

channels. He highlighted the importance of instant interaction for efficient collaboration, a factor lacking in digital communication.

Constantin also stressed the irreplaceable nature of physical interaction, especially in the context of mentor feedback. While acknowledging the importance of feedback, he noted that digital platforms cannot replicate the nuanced dynamics of face-to-face discussions.

Professor Mihail Gavrilița's interview, an experienced PBL mentor at the Technical University of Moldova, further supports the decision to eliminate the chat function. He consistently underscored the significance of regular face-to-face meetings in mentoring and expressed a preference for direct communication channels over project management platforms. His inclination towards personal interaction aligns with the shift towards a more immediate form of communication.

Maria Colța, a student engaged in Project-Based Learning (PBL) projects, also provided insights supporting the implementation of a calendar function. Maria highlighted the significance of receiving feedback through face-to-face or online meetings, aligning with the calendar feature's goal of facilitating real-time discussion of detailed feedback.

In terms of communication tools, Maria mentioned platforms like Telegram, Discord, and Teams. The calendar feature complements these tools by providing a dedicated space for scheduling and organizing meetings, streamlining the project management process.

In summary, the decision to introduce a calendar function in BlueProject is well-supported by the insights from mentors and students. The emphasis on effective communication, preference for face-to-face or online meetings, and the need for clear task definition align with the goals of the calendar feature, aiming to enhance collaboration and project management within the PBL framework.

The opinions shared in the survey also led to the idea of excluding the forum and the page dedicated to project continuity. This is because a significant number of students, upon completing a project, tend to abstain from participating in subsequent projects and show little enthusiasm for online idea exchange.

Insights from interviews with Iuliana Stetenco, a student following a PBL curriculum, and Maria Colța strongly support excluding the forum and project continuity page. Both, having participated in multiple PBL projects, highlight challenges and trends in line with the survey.

Iuliana notes completed projects often don't lead to active follow-up due to challenges affecting motivation. Maria reinforces this by emphasizing issues in PBL projects, aligning with the survey's findings on decreased enthusiasm. Both students explicitly state not actively continuing PBL projects after completion, echoing the survey's finding. This strengthens the case for excluding a dedicated page for project continuity.

Both students prefer external project tools, suggesting introducing a forum or continuity page may not align with their existing workflows. Their feedback preferences for face-to-face or online meetings mirror the survey's observation that students may not enthusiastically embrace online idea exchange.

In conclusion, insights from Iuliana and Maria solidify the argument for exclusion, emphasizing the importance of aligning platforms with existing practices and addressing identified challenges.

Finally, the surveys underscored the concept of implementing a dashboard featuring tasks categorized into milestones. To validate this concept, we conducted interviews with Professor Cristofor Fiștic, a PBL mentor at the Technical University of Moldova, Nicolae Gudumac, co-founder and CTO at Planable, and Roman Gusev, a student actively engaged in a PBL curriculum. These interviews were instrumental in providing a comprehensive vision of the proposed dashboard system.

Professor Cristofor Fiștic acknowledges challenges in task prioritization and the impact of poor management on team success. His insights underscore the need for a structured approach to project management. The proposed dashboard, with its emphasis on tasks categorized into milestones, aligns precisely with addressing these challenges. It provides a clear framework for task organization and prioritization, fostering effective team collaboration and success over the course of the project.

Nicolae Gudumac, co-founder and CTO at Planable, shared crucial insights during interviews aimed at enhancing the BlueProject concept. He highlighted the critical role of supporting teams and allocating resources for success within a startup. Nicolae emphasized the importance of a structured approach to project management, specifically advocating for the organization of tasks into milestones. This insight resonates with the proposed milestone-based dashboard system for BlueProject, reinforcing the need for clear task organization and prioritization.

Roman Gusev, an actively engaged student in a PBL curriculum, provides firsthand accounts of challenges in teamwork, task delegation, and engagement. His experiences, particularly the uneven distribution of workload due to varying skill levels within a team, highlight the importance of a dashboard that ensures fair allocation of tasks. The milestone categorization becomes crucial in this context, offering a tangible structure for managing tasks and ensuring equitable contributions from all team members.

The envisioned dashboard system emerges as a solution that not only aligns with the identified challenges but also caters to the diverse needs of both mentors and students. Professor Fiștic's emphasis on more resources and an organized structure finds resonance in the proposed dashboard, which aims to provide a centralized platform for effective project management.

All in all, the interviews with Professor Cristofor Fiștic, Nicolae Gudumac, and Roman Gusev validate and enrich the concept of a milestone-based dashboard. Their insights provide a good understanding of the challenges in PBL projects and affirm the relevance and necessity of the proposed dashboard system.

Complementing these insights, the interview with Artiom Pînzari, Project Coordinator at the Startup Moldova Foundation, provides valuable perspectives on challenges in project management. Artiom's experiences highlight the critical role of clear communication, proper delegation of tasks, and accurate deadline calculations in successful project implementation. Artiom's emphasis on efficient task tracking and the use

of various project management tools, including Google Sheets and platforms like Notion and Monday, offers valuable considerations for BlueProject's development. His feedback on the importance of affordable yet innovative project management solutions resonates with the platform's goals.

In summary, BlueProject's evolution, driven by thorough research and feedback, strategically focuses on optimizing for Project-Based Learning (PBL). The decision to exclude hackathon participants aligns with insights from experienced individuals, leading to tailored adjustments such as eliminating the chat and adding a calendar. Exclusion of the forum and project continuity page aligns with student preferences and challenges. The validated milestone-based dashboard system emerges as a solution addressing the specific needs of mentors and students in the PBL context, positioning BlueProject for effective collaboration and structured project management.

## **System Modelling**

To get a better understanding of the application, the workflows and the processes are going to be described using UML diagrams.

### **UML Activity Diagrams**

Through UML activity diagrams, the functionality of the application has been examined, focusing specifically on the following main processes: "Organise Project", "Manage Task", "Complete Task", "Leave Feedback", "Schedule Meeting". The secondary processes are: "Log In", "Set Deadline", "Archive Project", "Download Report".

The primary process, "Organise Project", serves as the foundational step for managing a project. Firstly, it is checked if the project that the user wants to open exists or not. If it doesn't exist, the user is redirected to create it by completing the project initiation form, inviting teammates, inviting mentors, and if the information is valid the user is redirected to the project's dashboard. If the project already exists, then the user is able to open it and see the dashboard, as well as the status of the progress.

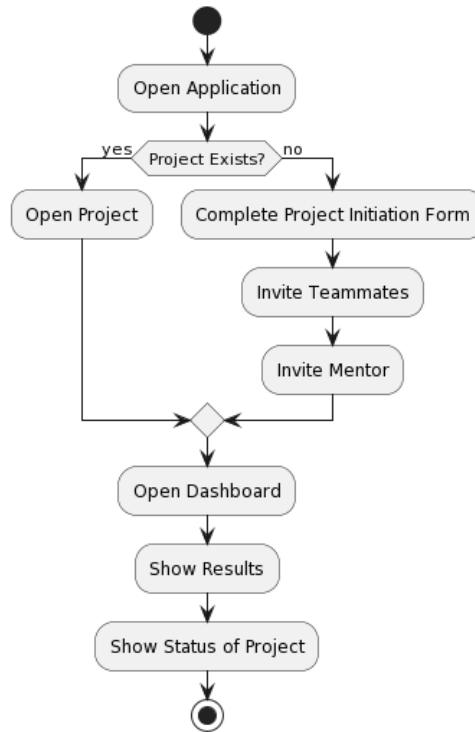


Figure 0.0.21 - Organise Project Activity Diagram

To ensure that BlueProject is suitable for each type of project, the user has the possibility to design specific tasks that would encompass the needs of the project. This is done through the main process "Manage Task". First, it is decided if the user wants to create a new task or modify an existing one. If the user chooses to create a new task, then the task creation window appears, which requires the user to introduce a task description, a deadline, and the person responsible for it. If the user chooses to modify an existing task, then the option to change the description, the deadline, or the person responsible for it is available. The final step is to save the changes.

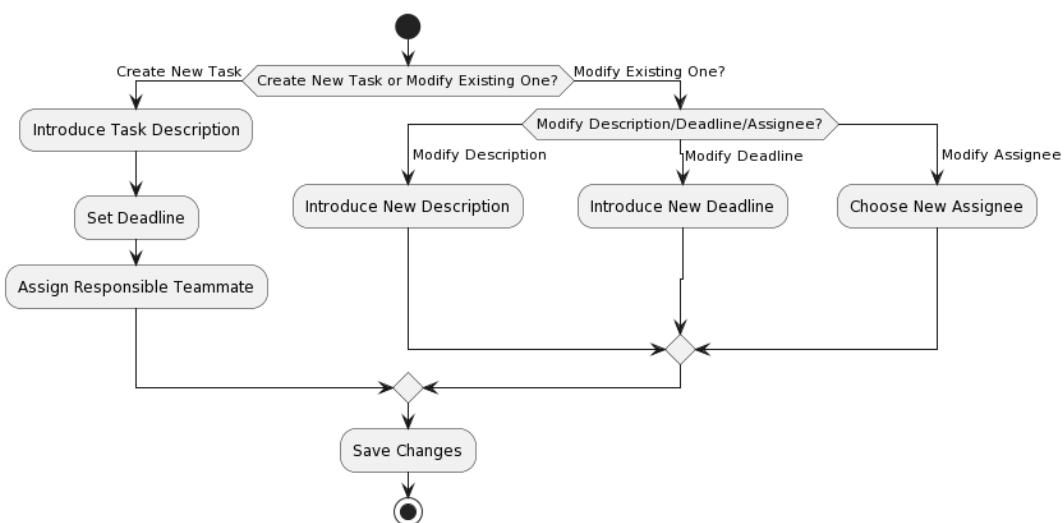


Figure 0.0.22 - Manage Task Activity Diagram

The next process, entitled "Complete Task", consists of opening a specific task, entering the text that is part of the completion of the task, attaching the necessary files, and saving the changes.

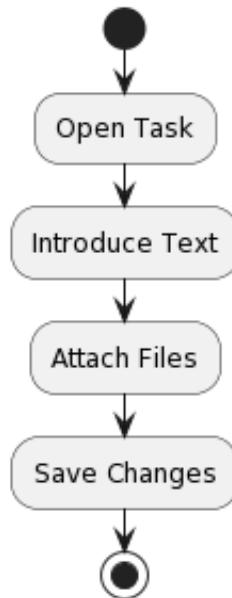


Figure 0.0.23 - Complete Task Activity Diagram

The fourth main process, entitled "Leave Feedback" is intended for mentors, as they are the ones who will provide feedback on the task completed by students. This process begins with opening the task, where the mentor can visualize the done work. After this, the mentor writes the feedback and saves the changes for the students to read it later.

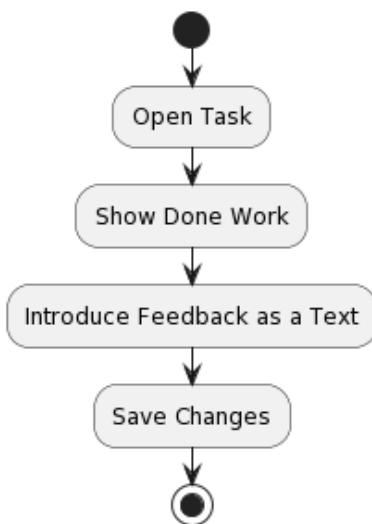


Figure 0.0.24 - Leave Feedback Activity Diagram

The last but not least main process, "Schedule Meeting", is strongly connected to the Calendar page. During this process, the user opens the calendar page, chooses a date, and, depending on the need, it

is marked by the user as a Team Meeting or a Mentor Meeting. After saving the changes, they will appear on the Calendar Page for everybody to see them.

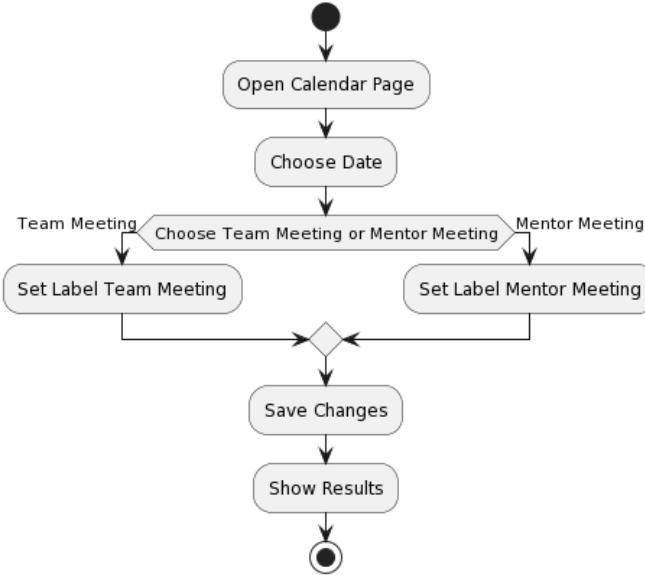


Figure 0.0.25 - Schedule Meeting Activity Diagram

The BlueProject Application would not be complete without its secondary processes. The first process, known as "Log In", offers users the possibility to proceed further in the application. The users open the application and choose whether they want to create a new account or use an existing one. If they choose to Sign Up, they must provide their personal information, credentials, and accept the terms and conditions. If they choose to Log In, then they must introduce their valid credentials. The next step is to get redirected to the home page, from where the users can proceed next.

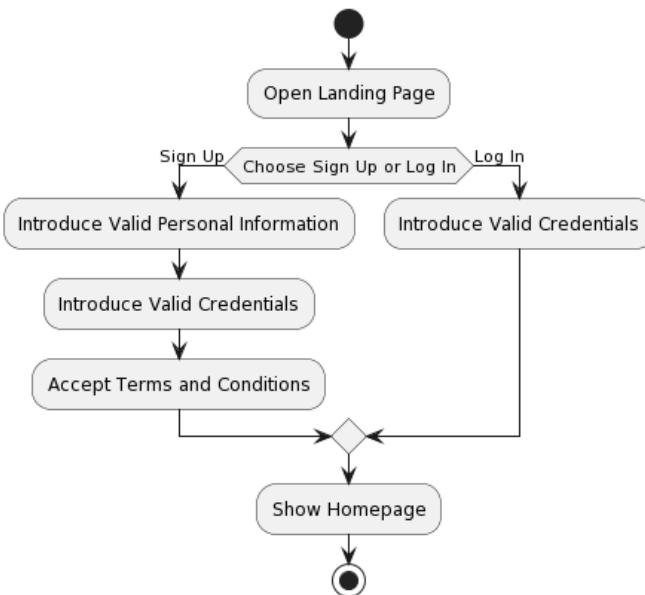


Figure 0.0.26 - Log In Activity Diagram

The next secondary process is "Set Deadline" which represents marking the deadlines of the tasks directly on the Calendar Page. This process includes opening the Calendar Page, choosing the desired section (i.e. Problem Exploration and Analysis, Solution Proposal and Vision etc.), where the task which must be marked is located. After this, the task is dragged and dropped onto the day which must be marked as the deadline, and the changes are saved. The results can be immediately observed.



Figure 0.0.27 - Set Deadline Activity Diagram

Another secondary process is "Archive Project" which represents archiving the project in the application for future reference. This process begins by opening the page of the project, clicking on the Archive Project Button, confirming the action, and redirecting to the Homepage.

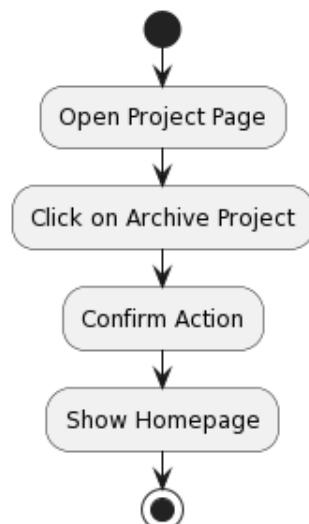


Figure 0.0.28 - Archive Project Activity Diagram

The last secondary process is "Download Report" which represents the downloading of a PDF file that is structured and completed with all of the inputs provided during the implementation of the project in the BlueProject application. This starts when the user accesses the page of the project and clicks on the button: "Export Dashboard as Report". After the user confirms the intention, the document is saved on the computer.



Figure 0.0.29 - Download Report Activity Diagram

In conclusion, these UML Activity Diagrams provide a user-friendly understanding of project management processes. By detailing both main and secondary activities, the diagrams offer users a comprehensive view of their interactions within the system, promoting clarity and enhancing user satisfaction and interaction.

### UML Use Case Diagrams

Within the UML Use Case Diagram, the intricate steps undertaken by both mentors and students are unraveled, capturing the essence of their interactions within the BlueProject application. Through a user-friendly interface and a thoughtful sequence of actions, a collaborative environment is engaged by mentors and students, designed to enhance project management and foster student development.

For students, the UML Use Case Diagram unfolds with "Login" as the initial step. Students can proceed to "Create Project", providing project details such as title, description, and user information. The system recognizes that students may not exclusively create projects, allowing them to seamlessly "Open Existing Project" post-login. Once inside an active project, students are presented with options to further manage and shape their collaborative experience.

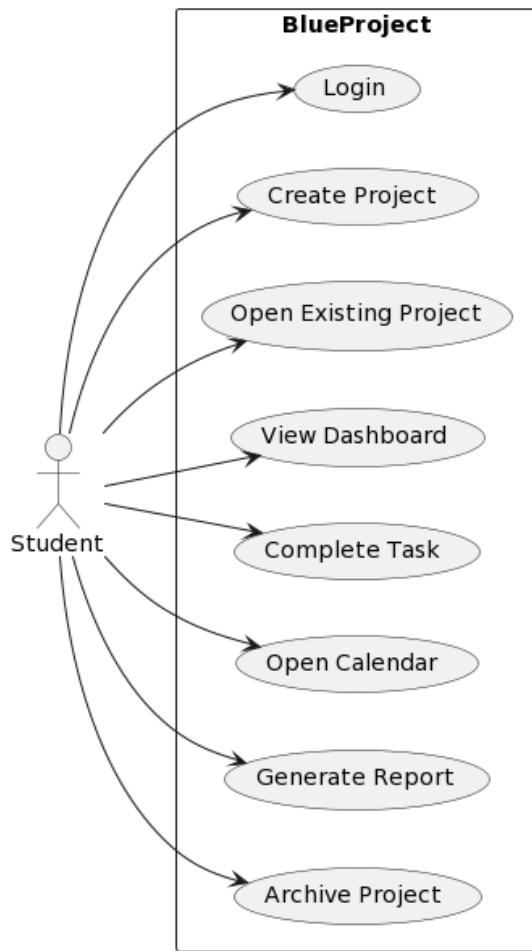


Figure 0.0.30 - Usecase Diagram for Student

The first option is "View Dashboard", enabling students to observe and interact with their project. At this stage, they can add, modify, or delete milestones. Upon selecting a milestone, students proceed to "Complete Task", where they can input text, images, documents, or external links to showcase their work. Next, students can "Open Calendar". This calendar serves as a practical tool for students to add important dates, ensuring they stay organized and facilitating seamless coordination within the project. This user-friendly option allows students to contribute to effective project planning and stay on top of crucial milestones.

Furthermore, students also possess the possibility to choose to "Generate Report," which consolidates all tasks into a comprehensive PDF file, or opting to "Archive Project" for convenient future reference.

Within the UML Use Case Diagram for mentors in the BlueProject application, the sequential flow unfolds with the initiation of the "Login" step. Once authenticated, mentors proceed seamlessly to various stages that align with their roles. After logging in, mentors can choose to "Open Existing Project". Within the context of an active project, mentors have the option to either "Open Calendar" for effective oversight or "View Dashboard" for a comprehensive overview. It's crucial to note that mentors, in this context, utilize these functionalities specifically to assess and monitor the progress of students.

Fostering a culture of continuous improvement, mentors are empowered to "Leave Feedback" within the project context. This step is a crucial element in the mentor's engagement, where feedback is provided to assist students in improving and refining their project work. The dashboard offers a general view, allowing mentors to gauge student activities, contributions, and overall project advancement. Moreover, after opening an existing project, mentors can choose to "Generate report" or "Archive Project", which assures that after the completion, the information and work put into the project are preserved for possible future use.

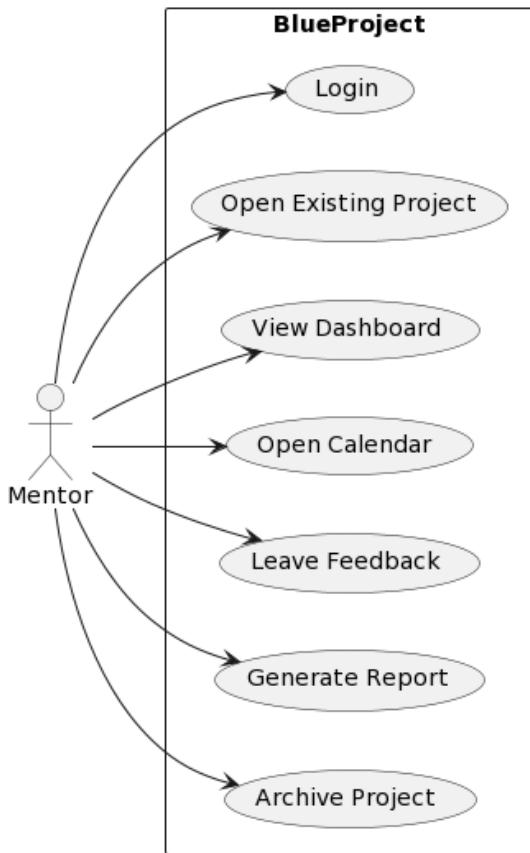


Figure 0.0.31 - Usecase Diagram for Mentor

Within the realm of non-functional requirements, the BlueProject system is designed to handle up to 200,000 users concurrently. Users also have the flexibility to change language settings, enhancing overall usability. When deploying new modules, the system ensures minimal impact on user experience, completing the process within an hour. The dashboard load time is set at a swift 2 seconds, emphasizing efficiency. To address potential risks during database updates, the system incorporates a fail-safe mechanism, rolling back related updates in case of failure.

In summary, the BlueProject system provides a straightforward and effective environment for mentors and students engaged in project-based learning. The functional requirements align with the needs of both user groups, while non-functional requirements guarantee a responsive, scalable, and reliable collaborative space.

## UML Sequence Diagrams

In the BlueProject application, all the processes depend on the interaction of the system's components. UML sequence diagrams describe all the main functionalities of the platform.

The journey begins with the authentication step, where the user makes a request to the application. In response, the application returns the Log In form, where user inputs all the necessary credentials, which must be valid. The application receives them and checks for a match in the database. If the match is found, a success response is returned and the application redirects the user to homepage.

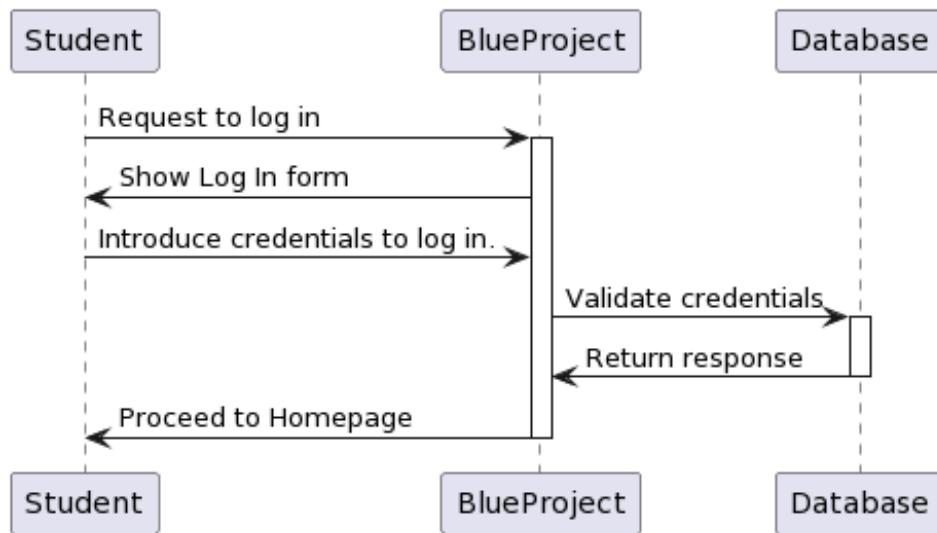


Figure 0.0.32 - Login Sequence Diagram

To initiate the creation of a new project, the user submits a request to the application. In response, the application provides a form for the user to complete, containing all the required project details. Once the user inputs the necessary information, it is saved into the database. Subsequently, the user is redirected to the project dashboard, where he/she can access and manage the newly created project.

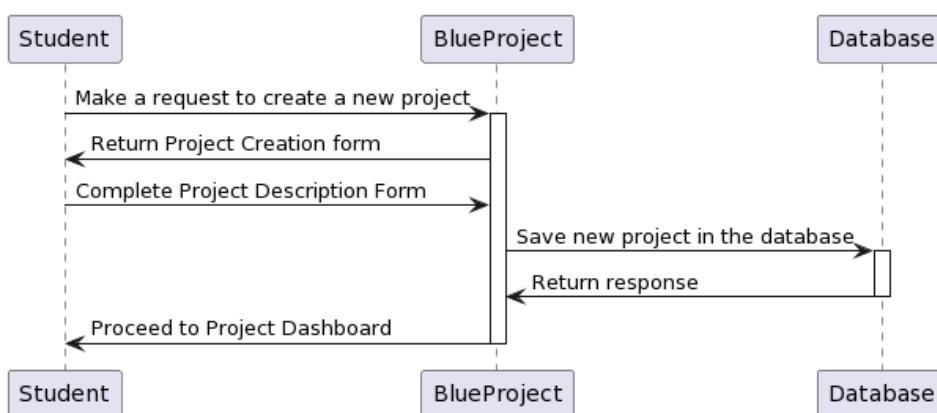


Figure 0.0.33 - Create Project Sequence Diagram

To modify an existing project, such as to create new tasks or sections, the user must make a request to open the necessary project page. If a match is found in the database, it is returned to the application, which shows it to the user. The user now has the possibility to make changes, which the application will save into the database, and if they are valid, a success response will be returned and the user will see the changes.

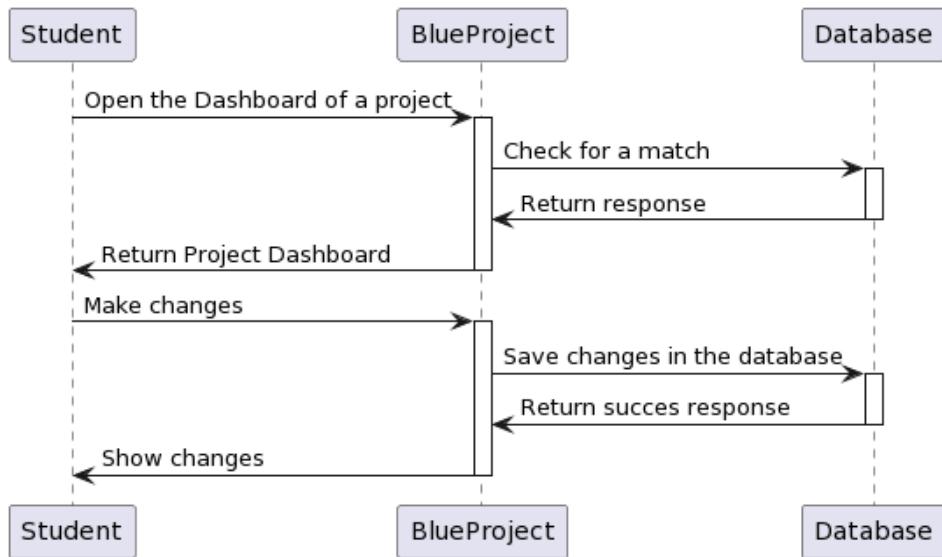


Figure 0.0.34 - Modify Project Sequence Diagram

To modify a task of a project, such as to change deadline, assignee, description or to complete it by introducing the text in the required field or attaching files, the user needs to make a request to open the page of the project. If there is a match in the database, it is returned to the application, which shows it to the user. Now, the user must select the task and click on it, which will be opened in the application based on the information provided from the database. When the user makes changes and clicks the "Save" button, the information is updated in the database and the user gets redirected to the Dashboard page of the project.

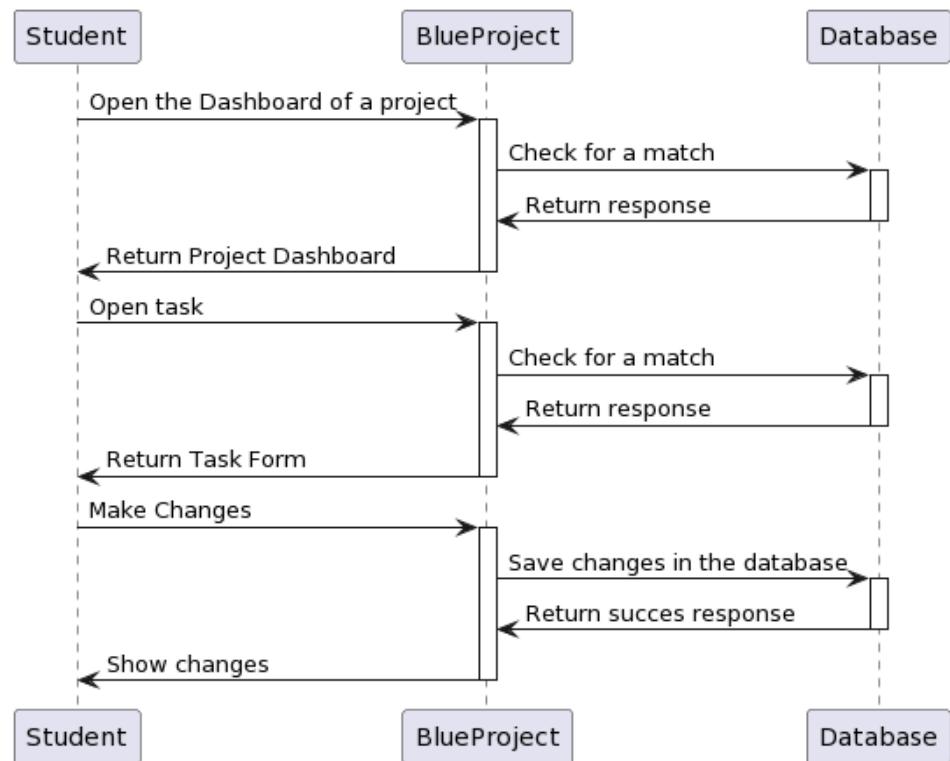


Figure 0.0.35 - Modify Task Sequence Diagram

To set deadlines or schedule meetings, the user has to make a request to the application to open the calendar page. In response, this page is rendered to the user. The next step is for the user to choose the task or the type of meeting and drag and drop it onto the necessary day. This information will be saved in the database and the user will be shown the changes in the application.

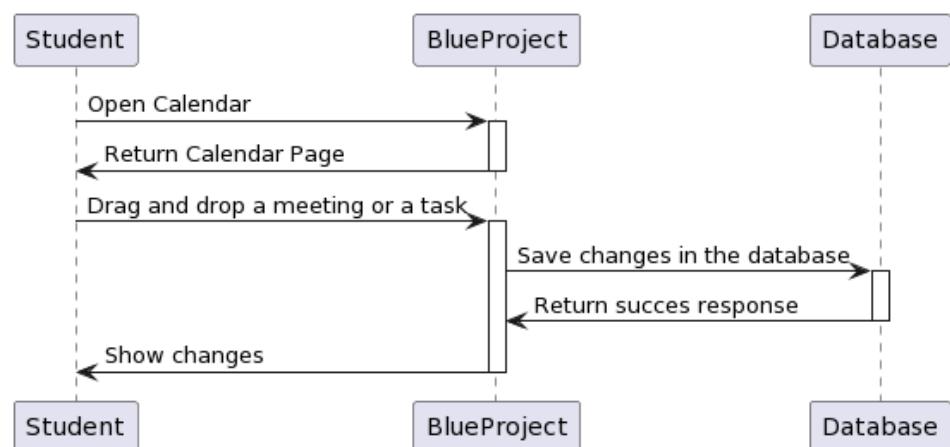


Figure 0.0.36 - Mark Calendar Sequence Diagram

For a mentor to leave feedback, he/she has to open the Dashboard of the project, which, extracted

from the database, will be presented in the application. To proceed next, the mentor has to open the task, whose information is extracted again from the database, and input the desired text into the field specially designed for this task. When the work is done, the information is saved in the database and the mentor is redirected to the Project Dashboard page.

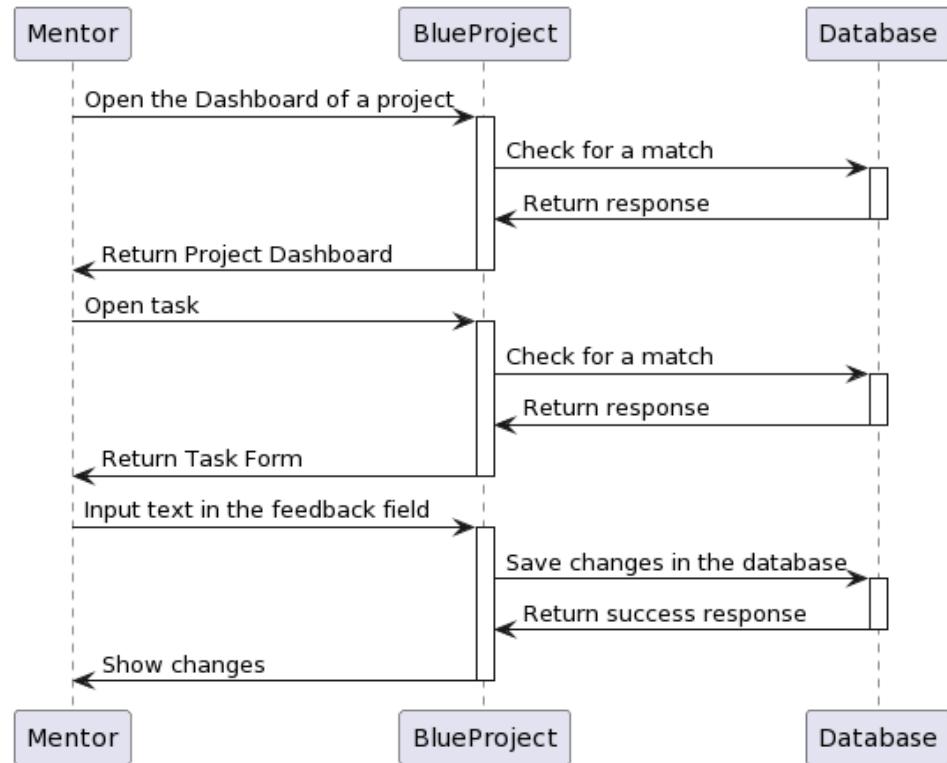


Figure 0.0.37 - Mark Calendar Sequence Diagram

To download the PDF report of the project, a user has to open the page of the project, the data of which will be extracted from the database. Then, he/she must click on the "Export Dashboard as Report" button and all of the information of the project from the database will be extracted, converted in a PDF file and downloaded on user's computer.

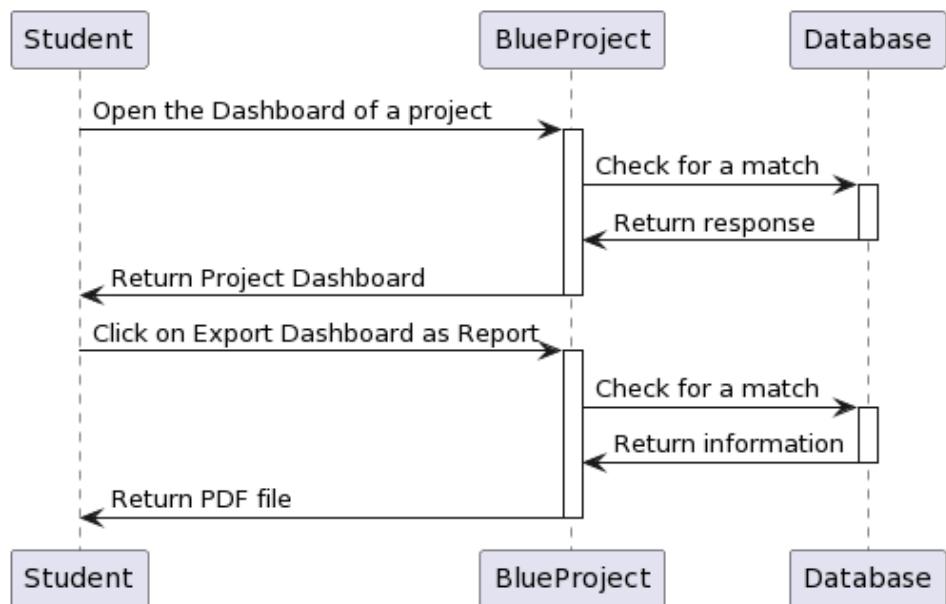


Figure 0.0.38 - Download PDF Report Sequence Diagram

Last but not least, to archive a project, the user has to open the dashboard page of the project, the data of which is extracted from the database. Then, he/she must click on the "Archive Project" button, which will trigger a request from the application to the database to change the status of the project. When completed, the database will return a success response and the user will be redirected to the Homepage.

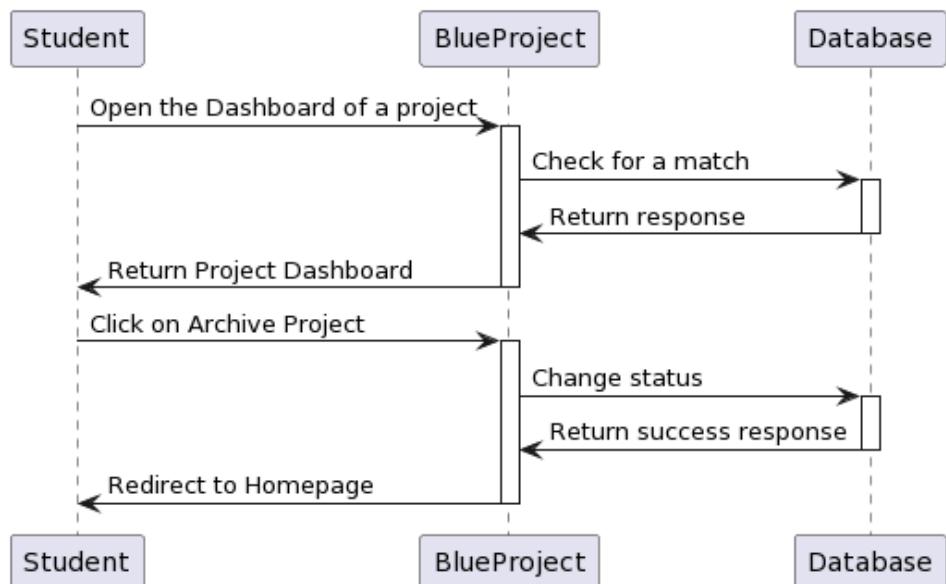


Figure 0.0.39 - Archive Project Sequence Diagram

In conclusion, these UML sequence diagrams show the interactions between objects in the sequential order that those interactions occur, offering a better understanding of the processes within the application.

## **Visual Representation of the Solution**

When accessing the page, users encounter a user-friendly Landing Page (0.0.40), from which the users can access the Registration and Login Pages (0.0.41, 0.0.42). New users seamlessly register with a unique username, password, and essential details, such as their roles. For returning users, a straightforward login process using their credentials is all it takes to access the wealth of features BlueProject has to offer.

Once authenticated, users are redirected to the Home Page (0.0.43), where they can choose to either create a new project, access the dashboard of an existing project, or access the Calendar Page (the userflow is available at 0.0.44). Creating a new project is a breeze – students select their role and input project details, including the title, background, audience, situation, solution, research questions, time span, team leader, and mentor (0.0.45). Valid data triggers invites to teammates and mentors, ensuring efficient collaboration. The newly created project is then seamlessly integrated into the list of existing projects (the userflow is available at 0.0.46).

BlueProject not only provides options to create new projects, but also access the existing ones. Selecting an existing project from the dashboard opens up the main functionalities (userflow available at 0.0.47). Users can see project details and status, making informed decisions and tracking progress effortlessly (0.0.48, 0.0.49). Speaking of task management, BlueProject empowers students to create tasks with detailed descriptions, due dates, and assigned responsibilities (0.0.50). Saving tasks triggers notifications for teammates, while the option to discard changes is also available (the userflow is available at 0.0.51).

For students, individual task details can be easily accessed for deletion or modification, fostering a dynamic and responsive project environment. As well, students can delegate other students or themselves for implementing the task. These actions result in a trigger of notifications to people involved (the userflow is available at 0.0.52). For mentors, only a dedicated feedback section is available, enabling constructive input, with notifications promptly reaching the learners (0.0.53). Learners can view the feedback and implement it into their work. The calendar feature allows learners to set deadlines and schedule meetings specifically per project, with notifications automatically dispatched to relevant parties (0.0.54). The mentor receives a notification too if he/she is invited to attend (the userflow is available at 0.0.55).

When the project is finished, both the learners and the mentors can download a PDF report of the team's activity based on the information that the learners provided as an input in the slot of the task. Moreover, if they want to save this project for future reference, they can archive it and use it whenever they need.

In conclusion, from the ease of project creation to the details of task management, BlueProject is crafted to empower both students and mentors on their academic journeys. As deadlines are met and meetings are scheduled, BlueProject remains the true friend for PBL management.

# **Conclusions**

BlueProject is a proposed concept to solve project management-related problems in project-based learning, revolutionizing the educational experience for students, instructors, and advisors. Through seamless integration of critical project management components, BlueProject can empower users with clarity, precision, and collaborative vigor.

After doing extensive research, has been underscored the need for a comprehensive project-based learning solution in education, as existing models, not necessarily designed for education, often lacked cohesion and streamlined management. This prompted the development of the concept of BlueProject, tailored to meet these unique demands.

Mentors would find BlueProject useful for guiding and monitoring their mentees, ensuring projects stay on track. Students could benefit from a structured platform that enhances critical thinking and problem-solving skills.

The impact of BlueProject can be profound. If implemented, it streamlines mentor oversight, leading to higher success rates for projects. Students experience heightened engagement, clearer direction, and enriched learning experiences. This not only improves project outcomes but also develops valuable problem-solving and critical-thinking skills.

All in all, the concept of BlueProject represents a leap in project-based learning, addressing a critical need identified through extensive research. Its potential impact is far-reaching, promising to empower mentors and students.

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# Appendix

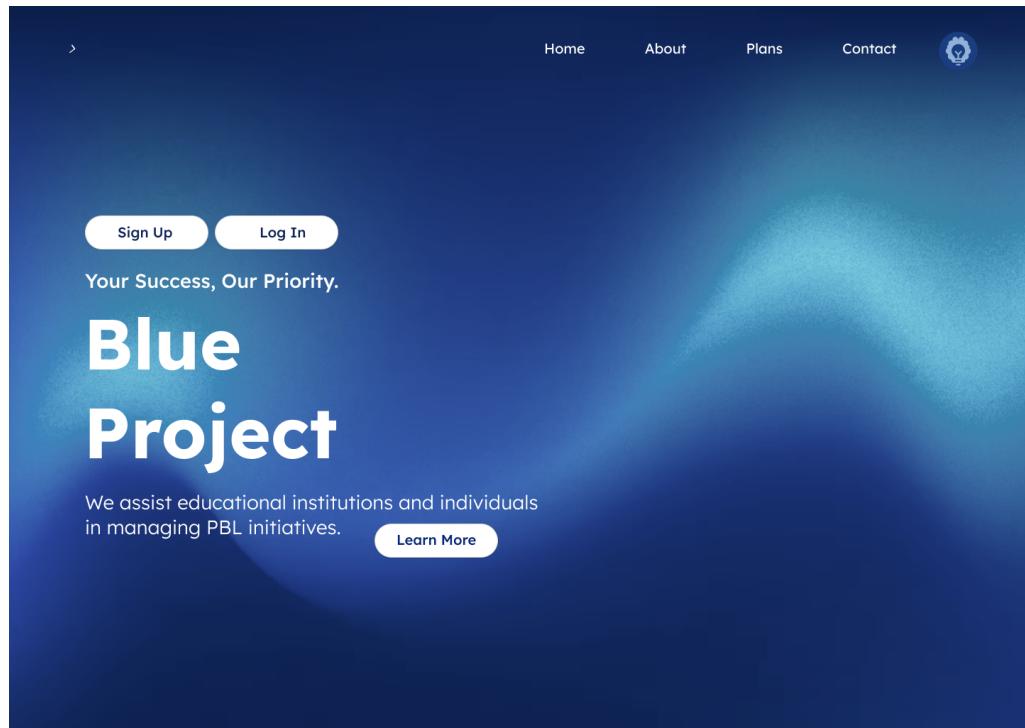


Figure 0.0.40 - Landing Page

The sign-up page has a light gray header with left and right arrows. The main title 'Sign Up' is at the top left. The form fields include: First name (Tyler), Last name (Durden), Institution (ex. UTM), Work email (abcdefg@outlook.com), Category (Mentor or Student selected), Phone number (optional) (+000 00 00 000), Password, and Confirm password. At the bottom are checkboxes for 'I agree with terms and conditions.' and 'Already a member?'. A 'Register' button is on the right. To the right is a sidebar with the 'Blue Project' logo featuring a padlock and lightbulb, and the tagline 'Your Success, Our Priority.'

Figure 0.0.41 - Sign Up Page

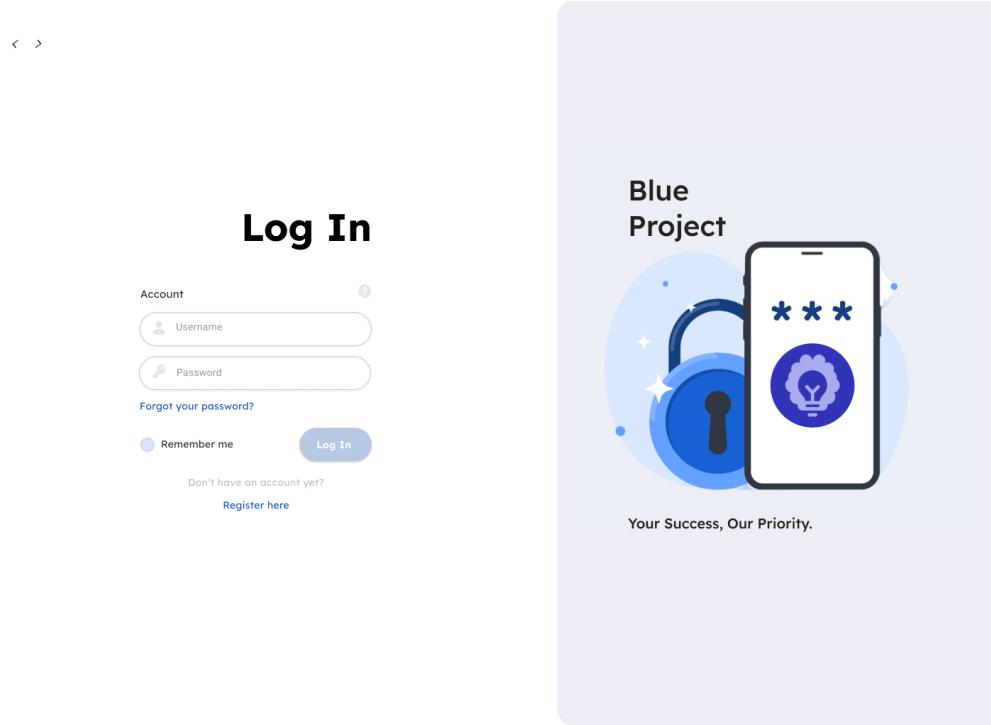


Figure 0.0.42 - Log In Page

The homepage of the 'Blue Project' app features a sidebar on the left with a user profile icon, 'Welcome, Your Name', 'Student' status, 'Settings' (gear icon), 'Dashboard' (list icon), and a list of projects: 'Project #1', 'Project #2', 'Project #3', and 'Project #4'. It also includes a 'Calendar' (calendar icon) and a 'Blue Project' section with a 'Find out more about PRO' button. The main content area is titled 'Dashboard' with a search bar, a '+ New Project' button, and a 'Calendar' button. It displays sections for 'Pinned' (with 'Project #2' and 'Project #4'), 'All' (with 'Project #2', 'Project #3', 'Project #4', 'Project #5', 'Project #6', and 'Project #7'), and 'Archived' (with 'Project #1'). Each project card includes 'Archive Project' and 'Export as PDF' buttons.

Figure 0.0.43 - Homepage

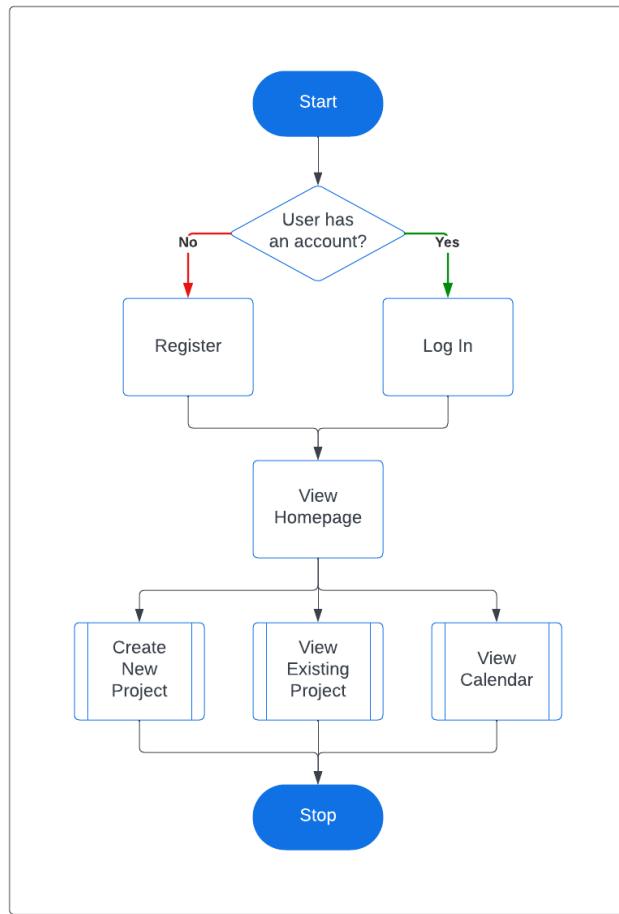


Figure 0.0.44 - Homepage Userflow

The mockup shows the 'Create a new Project.' page. The main heading is 'Let's get started.' Below it is a sub-section 'Create a new Project.' with several input fields:

- Idea Background:** A text input field labeled 'Enter text ...'.
- Authentic Audience:** A text input field labeled 'Enter text ...'.
- Solution:** A text input field labeled 'Enter text ...'.
- Project Title:** A text input field labeled 'Enter text ...'.
- Mentor:** A text input field labeled 'Invite Mentor by username or email'.
- Team Members:** A text input field labeled 'Invite Members by username or email'.
- Goal:** A text input field labeled 'Enter text ...'.
- Situation:** A text input field labeled 'Enter text ...'.
- Research Questions:** A text input field labeled 'Enter text ...'.
- Time Span:** A text input field labeled 'Enter text ...'.

A large blue arrow points from the bottom right towards the right edge of the page.

Figure 0.0.45 - Create Project Page

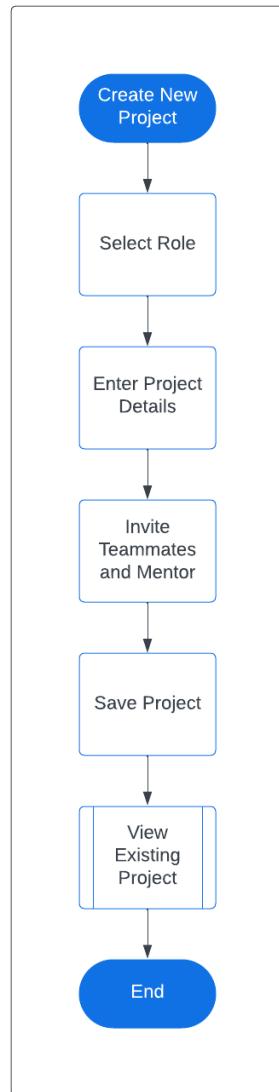


Figure 0.0.46 - New Project Userflow

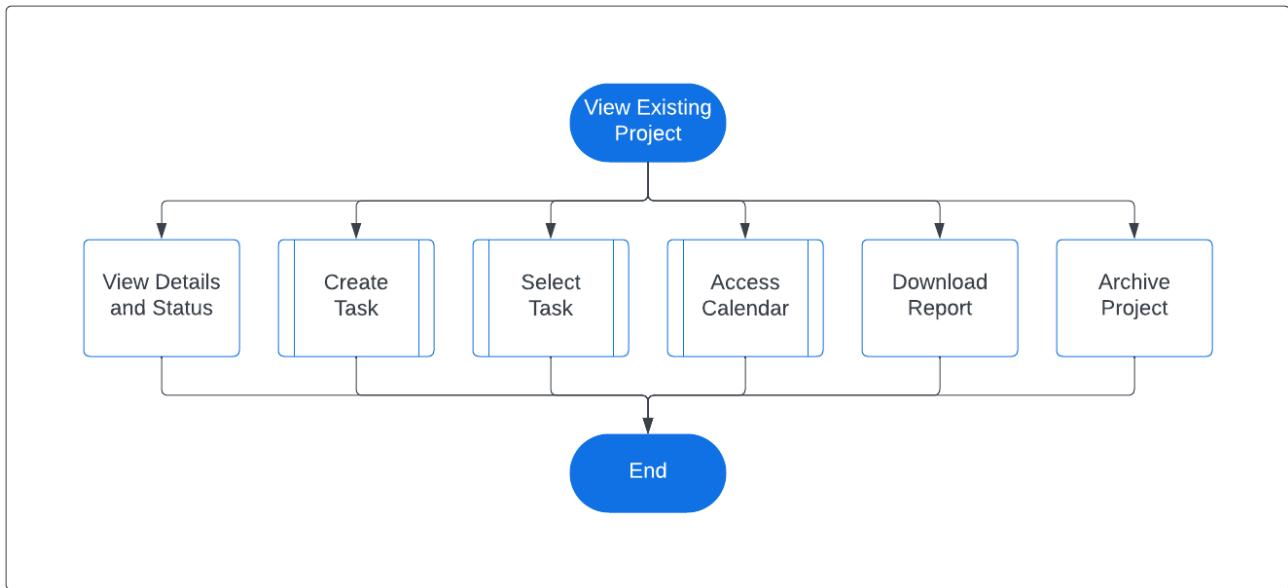


Figure 0.0.47 - View Project Userflow

The screenshot shows the "Project Name" dashboard for a learner named "Student". The left sidebar includes a profile icon, "Welcome, Your Name", "Student" title, "Settings", "Dashboard" (with four projects listed), "Calendar", and a "Blue Project" section with a "Find out more about PRO" button. The main dashboard features a header with "Project Name" and a progress bar. It contains sections for "Problem Exploration and Analysis", "Solution Proposal and Vision", "Target Audience and Validation", and "Competitive Target Analysis", each with a list of tasks and their completion status. A "My Team" section shows three team members: Leader, Mentor, and Member. A "Final Product" area is also present.

Figure 0.0.48 - Project Page - Learner View

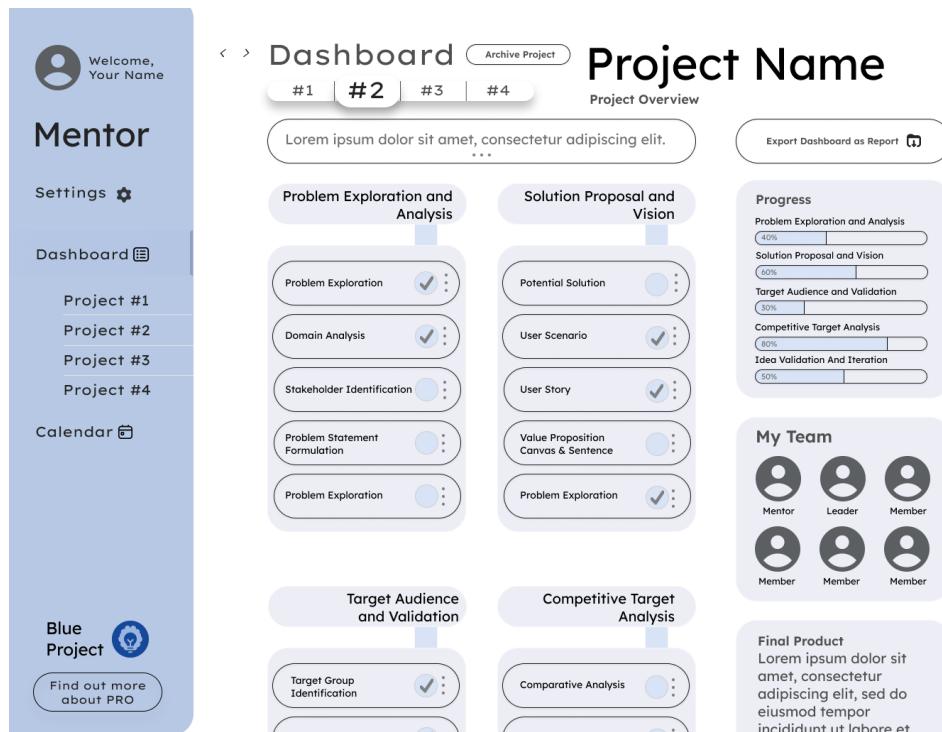


Figure 0.0.49 - Project Page - Mentor View

**Problem Exploration**

In problem analysis, focus on a profound understanding of the issue, identifying root causes, and collecting pertinent data for informed decision-making.

Assigned To: Member, Leader 88 ▾

Due Date: dd/mm/yyyy

Status: Done ✓

Enter text ...

Attachments: image.jpg exam.pdf

**Mentor Feedback:**

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

**Evaluated by:** Mentor Name ●

**Actions:**

- Add Image File
- Add Video File
- Add Audio File
- Add Other Media File ...
- Edit Submission
- Delete Submission
- Hyperlink
- Copy
- Poste
- Cut
- Add Multiple Files ...

Delete Task Discard Changes Save Changes

Figure 0.0.50 - Task Page - Learner View

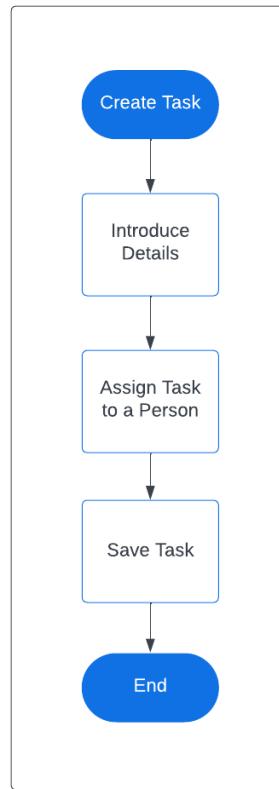


Figure 0.0.51 - Task Creation Userflow

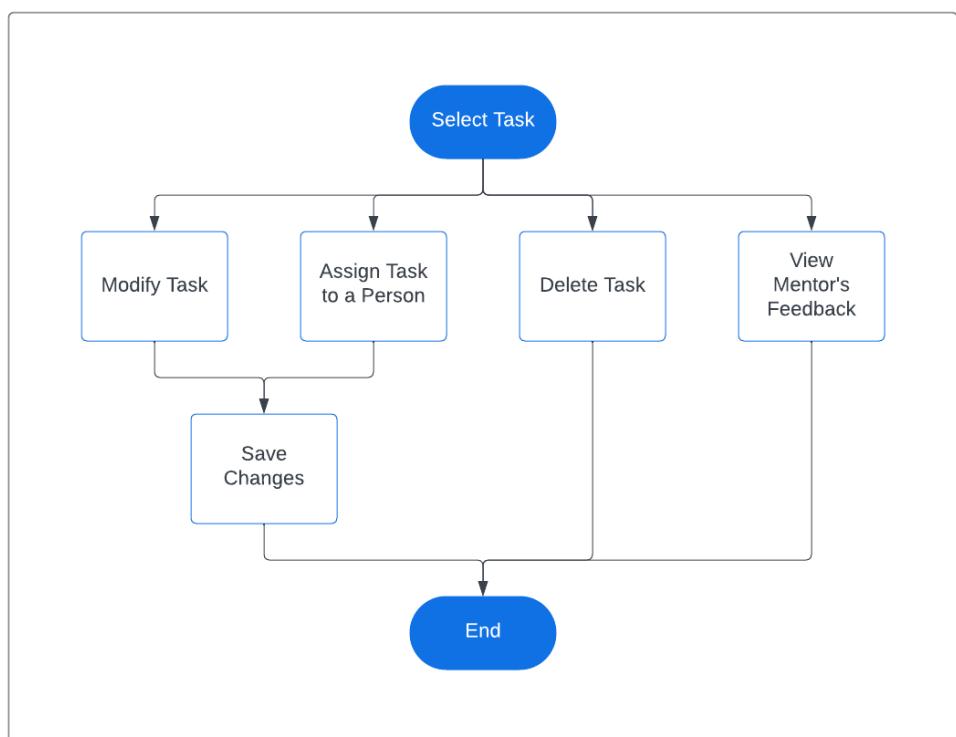


Figure 0.0.52 - Task Selection Userflow

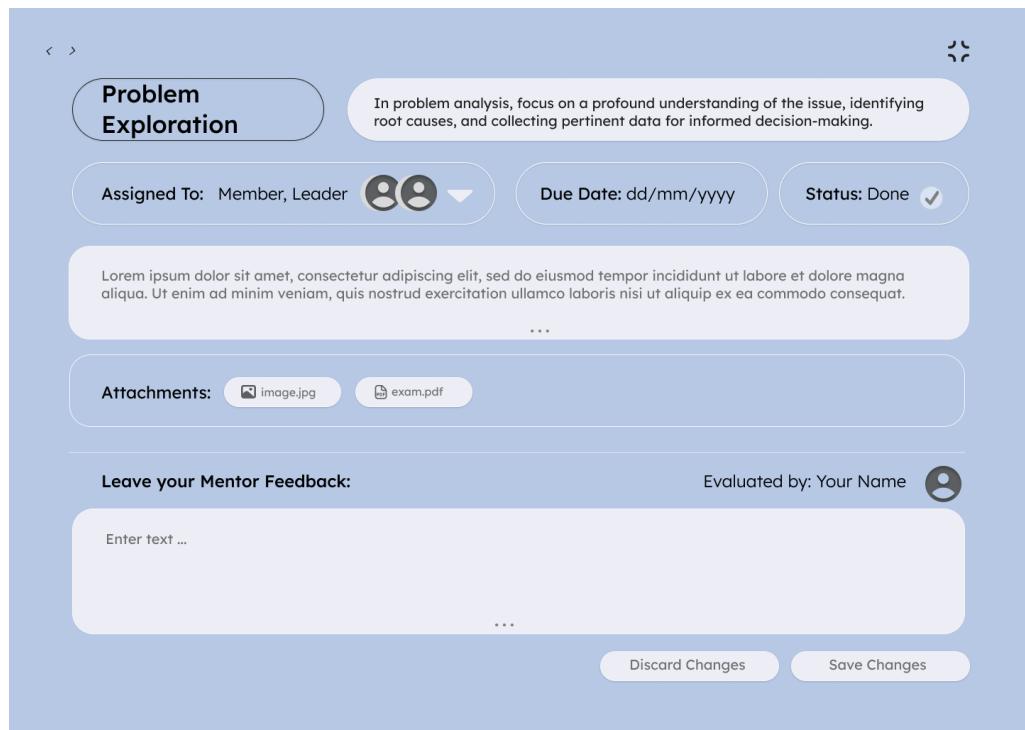


Figure 0.0.53 - Task Page - Mentor View

Figure 0.0.54 - Calendar Page

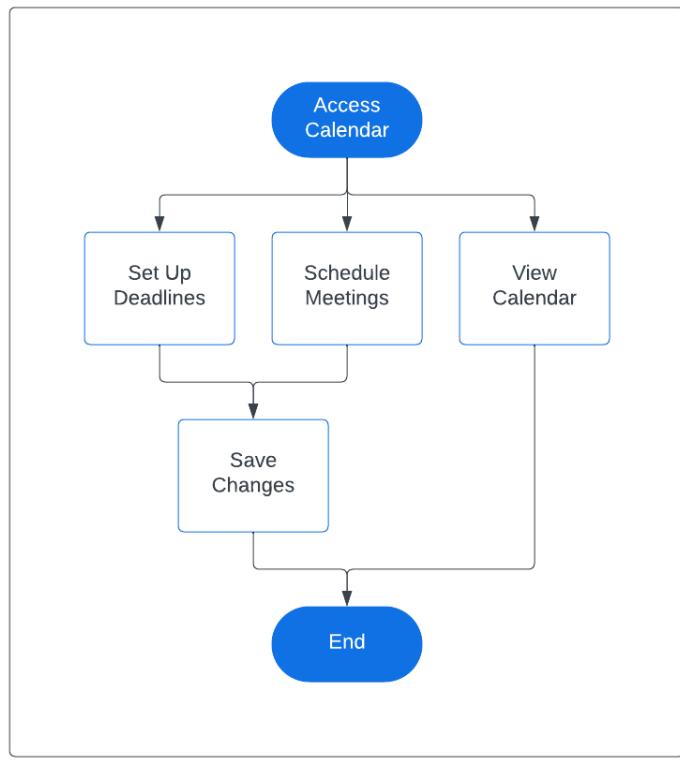


Figure 0.0.55 - Calendar Page Userflow