

Students' Point Of View of Real-Life Project-based Learning

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Abstract—Project-based learning (PBL) is known to be effective because learning is driven by active engagement and collaboration. Real-life projects are known to be motivating for students as they work on authentic problems to address societal issues. Teachers sometimes hesitate to implement them because of time constraints and doubts about whether course learning will be fulfilled. This paper is students' point of view of experience in developing a real-life online training program for Persons with Disability (PwD) awareness in an Instructional Systems Design (ISD) course. Students developed this training program in three phases, conducted a user study and reflected on their experiences. The user study results of the training program indicate that the developed content is useful for sensitization regarding the challenges faced by PwD and awareness of how to support them. The reflections indicate that it is possible to tackle real-life projects within the framework of a course without compromising on course objectives. Students' reflections proved that conceptual learning of the course topics was also achieved along with project development skills. This study is meaningful because it demonstrated the value of real-life project-based learning despite the time constraints of project execution.

Index Terms—Students' POV, Project-based learning, real-life projects, Instructional System Design

I. INTRODUCTION

In recent years, the integration of real-life projects in courses has gained significant traction as an effective pedagogical method. This approach provides an opportunity to immerse students in authentic real-life experiences and bridge the gap between theory and practice. However, teachers may have concerns such as time constraints of the project and whether all course objectives will be fulfilled [1].

This paper delves into the learnings from a real-life project-based course from the perspective of the learners themselves. The project was carried out as a part of the Instructional System Design (ISD) course; this course is at the introductory level and typically covers instructional design models, processes, tools and technologies. The project involved the implementation of a web-based training program aimed at creating awareness and fostering inclusivity for Persons with Disabilities (PwD) within a specific college environment.

We (the students) started with a high-level mandate: “*To create awareness among the functionaries of higher education about the needs of differently-abled persons*”. The project was carried out using the ADDIE model. The ADDIE model, which stands for Analysis, Design, Development, Implementation, and Evaluation, serves as a guiding framework for the systematic and efficient delivery of instructional content [2]. We conducted stakeholder interviews, interacted with experts, and went through relevant websites to decide the sub-topics and format of the material. The design and implementation were carried out with periodic reviews and feedback. For the evaluation, we invited four experts to review the content, from the perspectives of instruction design, information accuracy, and usefulness to the PwD cell and to the student community. Within the group of four experts, there was one ISD instructor, one representative from the college's PwD cell, and two individuals affiliated with a non-profit organization dedicated to serving people with disabilities. Subsequently, we carried out a user study on the usefulness and usability of the material with thirty students and three faculty. Finally, we handed over the website¹ to the PwD cell of the institute for inclusion in their training programs.

We did this project over three months, while also doing other courses and academic work. We reflected on our learnings from the course and the project execution. We feel that having a real-life project results in significant engagement and learning, within the time constraints of a course. We share a few pointers for the successful implementation of project-based learning.

II. PROBLEM DESCRIPTION

Our institution has a PwD cell. One of the goals of the cell is to sensitize students and staff members about the different challenges and support required for students with different disabilities. We, the students of the Instructional Systems Design (ISD) course (ET 614 Spring semester 2023 cohort), took up the important task of creating this sensitisation program as part of our course project. We had to create interactive digital content to provide accurate information about the challenges

and support for different disabilities, in an engaging manner. We had to not only learn ISD concepts and skills but also apply them in a real-life project within a stipulated time. We also had the challenges of working collaboratively on this project along with diverse academic activities.

III. RELATED WORK

Kokotsaki et al. [3] in their scoping review of PBL mentioned various studies conducted at schools (pre, primary, and secondary) and in higher education institutions, which establishes a relationship between positive learning outcomes and the use of PBL for a course. Almulla et al. [4] examined the effectiveness of PBL in enhancing student engagement by identifying multiple factors for the study, which were: collaborative learning, discipline subject learning, iterative learning, and authentic learning. Srinivasa et al. [5] have demonstrated the use of PBL in an undergraduate computer science course for Data Analytics and IoT topics. In this course, students were expected to apply their learnings of the content to a team-based project. Their understanding was assessed using surveys by the instructors.

PBL implementation challenges include insufficient training in collaboration and ineffective group rules leading to some students dominating projects. Student-related challenges include engaging different learners, suitable tasks based on skills, and difficulty working in pre-set groups [6]. This paper reports firsthand student accounts of real-life PBL pedagogy.

IV. COURSE DESIGN

The Instructional System Design (ISD) course used a PBL approach. The course had different modules that covered various aspects of instructional design, including an introduction to ISD, an exploration of instructional design models such as ADDIE, SAM (Successive Approximation Model), and LCM (Learner-Centred MOOCs), and an in-depth analysis of the TPACK framework [2], [7], [8]. A unique feature of the course was the real-life project, which required us to develop an awareness program by utilizing the concepts learned throughout the ISD course. To aid our project, we were introduced to a PwD sensitization session from the UMMEED foundation² and other stakeholders in the disability community. We engaged with people with disabilities to understand their challenges and integrated insights into the course project. Assessments included reflections, project presentations, oral and mid-semester exams, evaluating both theory and practical skills for continuous improvement.

V. COURSE IMPLEMENTATION

During the implementation of this course, we experienced a lively and collaborative environment. Students were divided into three groups, each with different roles and responsibilities crucial to the progress of the project. Some senior students participated voluntarily in the course due to their interest in the project. They served as mentors and provided guidance to us. The presence of senior students ensured a diverse range

of perspectives and expertise. Collaboration with the senior students allowed for the exchange of ideas and knowledge, enhancing the overall learning experience for us.

The PwD awareness website consisted of 4 divisions - Attention Deficit Hyperactive Disorder and Learning Disabilities, Autism, Visual impairment, and Locomotor disability. Overall there were twenty-three students, grouped into 4 for each category of disability. We presented the website to the stakeholders twice during this course. Their feedback helped us in making significant improvements to the website. We wanted to make sure it aligned with our goals and objectives. We were committed to continuously improving and reflecting on our work to become better at designing instructional systems.

Mapping the course to the ADDIE model: The first three classes focused on understanding our prior knowledge and setting the learning objectives. We were introduced to fundamental concepts such as instructional design, and universal models of project development like ADDIE and SAM. This introduction to different models was crucial in setting the stage for subsequent phases. ADDIE is a well-known instructional design model consisting of 5 phases - Analysis, Design, Development, Implementation, and Evaluation.

In the “**Analysis**” phase, we were introduced to the problem statement and we brainstormed on what might be a better way to create awareness for the target audience - college students. We also came up with iterations of defining the learning objectives of our targetted users. The entire process is depicted in Figure 1.

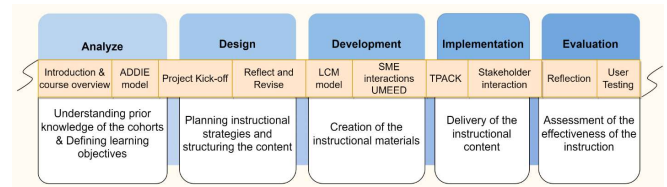


Fig. 1. ADDIE Model

In the “**Design**” phase, we planned the instructional strategies and structured the content. Designing content for the assigned project started at this stage. The sensitization for us regarding PwDs and their day-to-day life was introduced through an engaging session conducted by people from the UMMEED organization. Interaction with various stakeholders at this stage prepared us for the next development phase.

In the “**Development**” phase, we created and curated the instructional materials. We were introduced to various tools such as Animaker, H5P, and Canva, which are instrumental in developing and designing instructional materials. All these tools were learned on the go with the help of peers. While developing the content, the LCM model was also used in creating the materials. This course also emphasized the development of soft skills such as communication and teamwork, which were essential for the successful execution of the project.

The “**Implementation**” phase is characterized by the delivery of the instructional content. To ensure that the website

²<https://ummeed.org/>

achieves its objective of sensitizing people a three-stage instructional delivery was used. The first part of the website in each of the four modules had some introduction to the respective disability, followed by sensitization activity and finally how to support them.

For “**Evaluation**” with respect to the project was conducted in two major subject matter expert feedbacks in addition to multiple internal presentations and peer feedback. This took place in an iterative manner and the feedback informed us in updating our work. The final evaluation of the website was the usability study of the website. The results of the user study are explained in detail in the next section.

VI. USER STUDY

The user study feedback was collected through a Google form that contained survey questions with Likert scale responses. In this context, the individuals being sensitized were users. We have at least eight users evaluate one module of the website, and overall 38 users provided feedback on different usability aspects of the project. In total, there were 15 survey questions for four disability modules - Locomotor Disability (8), Visual Impairment (13), ADHD (9), and Autism (8). The user study feedback contained questions that were categorized into five attributes - Easiness (Ease of use or Ease of learning), Integration, Interface Design and Usability, Content Comprehensiveness and Language Appropriateness. These attributes are vital in our user study because they determine the success of the instructional materials developed. Easiness ensures a smooth learning curve, while integration ensures seamless compatibility. A well-designed interface enhances user engagement and usability enables efficient navigation. Comprehensive content and language appropriateness facilitate effective communication and learning experiences.

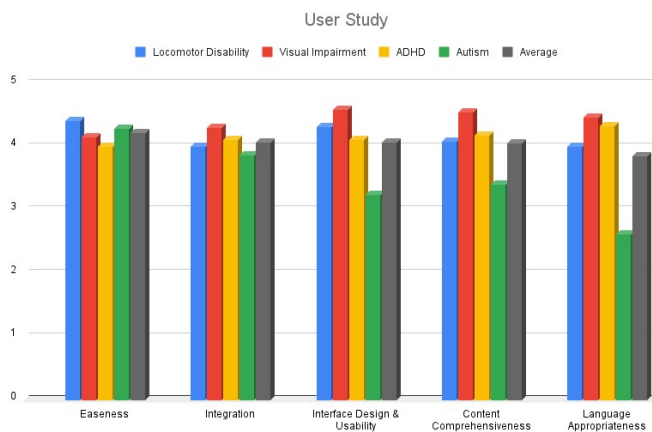


Fig. 2. User Study Results

In Figure 2, the x-axis shows the five constructs and the y-axis denotes the mean of the Likert scale scoring by the participants for each of these features on a scale of 5 (1-Strongly Disagree, 2-Disagree, 3-Neutral, 4-Agree, 5-Strongly Agree). The figure indicates that most of the participants have agreed about the easiness, integration, interface design and usability,

content comprehensiveness and language appropriateness of all four training modules with an overall average value of approximately 4 (as indicated by greyish black colour bars in the figure 2) for each attribute respectively.

VII. CHALLENGES

The challenges are broadly classified into five categories: (i) Learning new tools and applying them, (ii) Making the content engaging while keeping it simple, (iii) Incorporating feedback, (iv) Executing a real-life project, and (v) Finishing within time constraints; and Managing diverse collaboration. Out of all five mentioned above, the first two were related to course-based challenges, and the last four were challenges that arose because of incorporating a real-life project in the course.

Learning new tools while producing videos and other content added to the development phase’s challenges. Technical issues, such as syncing audio with scripts and depicting disabilities that are not physical or visually apparent like learning disabilities, required careful thought and consideration. Another challenge that we faced was creating a website with engaging content that captures attention, motivates audiences, and raises awareness about PwDs. We had to find a balance between simplicity and complexity in our training module. We also had to consider whether our content was too specific or too general and ensure that it was usable. We had to ensure that the information presented was applicable, the website was easy to navigate, and the contents flowed systematically to engage the users. To address this challenge we developed a template for the website. Each module of the website had the following sections - Introduction, Sensitization (How it Feels), Scenarios, Check your Understanding and Inspiring Stories. This ensured that the content was easy to navigate without compromising the accuracy.

This being a real-life project, redesigning the website based on their feedback, while considering design principles and usability, was a complex task. Reaching out to the target audience, and managing time effectively were additional challenges during the evaluation phase. We overcame this by a divide-and-conquer approach of assigning different roles amongst ourselves. In conclusion, the PwD project presented numerous challenges throughout its implementation. From creating engaging content to designing an accessible website and consolidating feedback. In the next section, we explain in detail our learnings from this real-life project-based learning course.

VIII. LEARNINGS

A. Course related

This was our first experience with a course entirely based on project-based learning, which integrated a real-world project. Throughout our participation in the course, we had the opportunity to engage in hands-on experiences that made the learning process both interesting and inspiring. With respect to the course content, all of us felt that we learned about different ISD models and have also implemented a few of them in the course project. We acquired new skills in using

tools like Animakar™ and Canva to create engaging content. We gained insights into creating application-based multiple-choice questions using ChatGPT, exploring different features in Google Websites, and creating videos using Canva. Exploring AI powered tools for content creation, and incorporating reflection points using H5P proved effective in engaging users. Throughout the course, we discovered various tools and techniques such as Synthesia™ for AI voice generation, Animaker for character-based animation, BNIME for sketch-style videos, and H5P for interactive content.

B. Project-related learnings and skills

Collaborating with fellow participants was a unique experience as we engaged in discussions and debates that ultimately converged towards building and presenting various resources on the webpage. We learned to collaboratively work in a group setting effectively and also benefitted from diverse perspectives and ideas from seniors. We recognized the significance of receiving feedback to refine our work and achieve our goals effectively. As a result of executing this project, we learned to adhere to the timeline and utilise ISD concepts for research, design, creation and feedback.

This course transformed us by boosting our confidence, improving our collaboration skills, deepening our empathy, and broadening our understanding of the diverse needs of individuals with disabilities. We learned to create inclusive environments and embrace feedback to refine our work. These insights will shape our future endeavours and contribute to our ongoing growth.

IX. REFLECTIONS

Following the challenges and learnings discussed above, we share our reflections on what worked best for this real-life project-based learning course. One of the key aspects that we would like to stress upon is the commonality of goals among all groups. Having a shared objective allowed for meaningful discussions and collaborations. It created an environment where ideas could be shared, different perspectives could be considered. It encouraged open and constructive dialogue, leading to the exchange of valuable insights and the development of the project. The common goal served as a unifying force, fostering a sense of camaraderie among us learners. This also aided in delivering an acceptable online PwD awareness program instead of diverting our energy into various small products for awareness.

The scoping process of making decisions about what to include and what to exclude proved to be crucial factors that contributed to the overall success of the project. By scoping down the project, we define boundaries and set clear objectives, ensuring that we focus on what is essential and achievable within the given constraints. This process helped us to prioritize tasks and allocate resources effectively, maximizing the chances of project completion successfully.

During the course, several checkpoints were established to ensure the successful delivery of our projects. These checkpoints served as milestones to monitor progress and ensure

that we were on track. Setting realistic deadlines that accommodate the availability of all team members also ensured that everyone had equal opportunities to participate and contribute, regardless of their schedule limitations. All of these provided opportunities for seniors and mentors to review our work and provide guidance and support when needed.

Two major feedback sessions from the client side heavily contributed to the completion of the project. Peer feedback was an essential component of the source, both within and across groups. By receiving feedback from individuals with different perspectives and skill sets, we gained valuable insights and were able to refine our projects further. Regular feedback sessions provided an opportunity for peers to review and critique each other's work. This feedback loop not only helped in identifying areas for improvement but also ensured that the project output was usable. Instructors may contemplate these concepts when crafting their courses, employing real-life problem-based learning (PBL) to achieve the intended educational outcomes for their students.

X. CONCLUSION

In this paper, we present the experiences and learnings of students who participated in a real-life project for an instructional design course. Despite concerns regarding time constraints and meeting course objectives, the students discovered that this approach yielded significant benefits for understanding course topics and acquiring practical skills, such as time management, communication, and collaboration. The challenges encountered during the project further reinforced the value of this instructional design approach. To ensure successful implementation of real-life project-based learning, shared objectives, scoping down the project, multiple checkpoints, and continuous feedback and reflection are crucial factors. These pointers are essential for achieving success with this approach.

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