



# Digital Excellence Impact Case Studies

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Empowering Change through Multidisciplinary Education:  
Creating Meaningful Differences in the Real World

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## Background

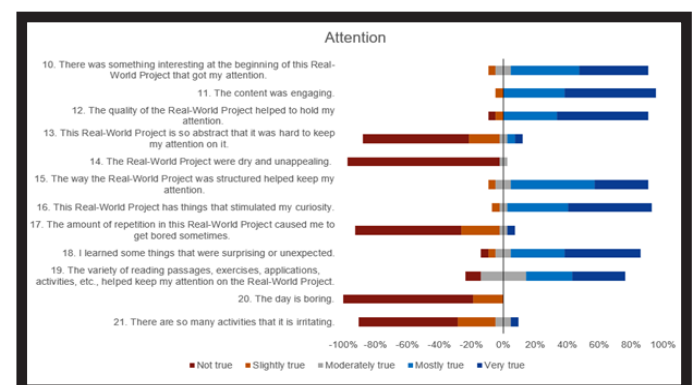
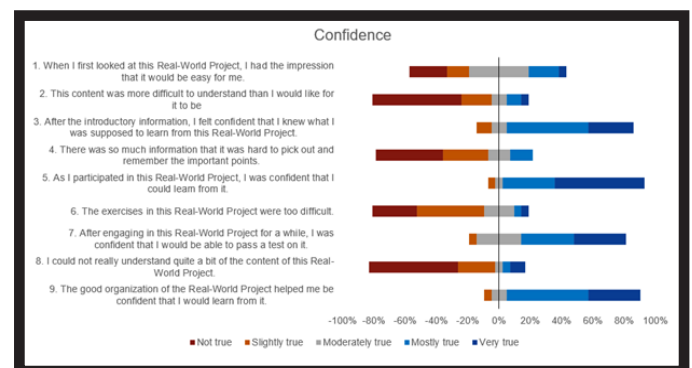
Multidisciplinary studies have gained recognition in the field of education for their ability to develop individuals with diverse skill sets and a well-rounded perspective. Real-world project-based learning has emerged as an innovative approach within this context, going beyond traditional disciplinary boundaries. However, to fully comprehend its effectiveness and address the challenges it presents in multidisciplinary studies, a comprehensive research approach is crucial. This study aims to provide comprehensive exploration of the benefits and challenges of real-world PBL education in multidisciplinary subjects related to computing.

## Approach

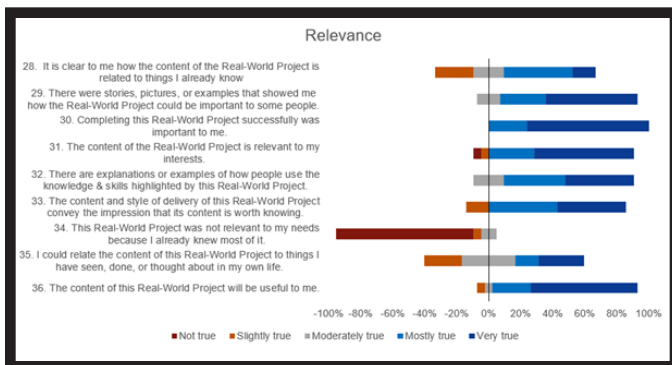
To achieve our objectives, we implemented real-world PBL as the primary learning approach, and encouraged students to take multidisciplinary projects. The project is completed by the students in 12 weeks. To gain valuable insights, a mixed-methods research design was employed. This approach combines qualitative and quantitative data collection and analysis methods, enabling a well-rounded examination of the subject matter. In-depth interviews were conducted for the qualitative method, exploring the benefits, challenges, and best practices of this approach. Complementing the qualitative data, quantitative methods were utilised to assess students' perceptions of real-world project-based learning. This quantitative data provides statistical evidence to support the findings and enrich the overall analysis. The survey included the participation of 22 students, while 15 students were involved in the interview process. By employing a mixed-methods research design, this study aims to draw evidence-based conclusions.

## Outcomes

The results demonstrated positive impacts of real-world PBL on multidisciplinary education. Students experienced an environment that simulated real industry scenarios, which helped them develop problem-solving and critical thinking skills. Students are satisfied with the project, with 95.5% reached upper medium to high motivation level. The findings also suggest that the students are confident to learn from real-world PBL, found the project to be interesting, satisfied with the experience, and perceive the project to be relevant to be applied in the real world. Notably, students demonstrated improved abilities in developing practical solutions, which are highly valued in the industry. The summary of the survey data can be seen in Figure 1 below.



“The project provided a predominantly positive experience, leading to the development of valuable skills, boosted confidence, and the practical application of knowledge.



Students also provided positive feedback regarding staff support and group dynamics. They appreciated the assistance provided by staff members in addressing issues and the promptness of their responses. However, they identified areas such as workflow management and project organisation that could be further refined. Some students also expressed the need for additional domain knowledge support to expedite their results.

“If I've had any questions or I've needed some support or an additional point of view, I've always been able to get that support”, commented student J.

While students felt that their goals were generally achieved, they acknowledged that there were still aspects that could be further covered. The project instilled confidence and motivation, inspiring participants to seek out opportunities to apply their skills in real-world contexts.

“It gave me a belief that I can go to the world and start showing myself”, commented student T.

Overall, the project provided a predominantly positive experience, leading to the development of valuable skills, boosted confidence, and the practical application of knowledge. Nevertheless, challenges concerning time management, project organisation, and the requirement for domain-specific expertise were acknowledged. The summary of the interview results is presented in Table 1 below.

In the project, students expressed a mix of enjoyment and challenges. Despite being outside their comfort zone, they found the project engaging and beneficial to their professional interests. The allocated timeframe was seen as insufficient by some, but others appreciated the real-life pressure that helped them improve their organisational skills.

“It was definitely a challenge, but you only learn more by having a challenge. If it was too easy it would be pointless, we learned a lot.”, commented student D.

The project yielded significant learning outcomes for students, particularly in terms of acquiring practical skills and improving time management. Students expressed confidence in applying their newfound skills to real-world scenarios, although they acknowledged the need for further improvement.

“Before the project, I'll put (my skill) at six out of 10 and after the project, I'll put it at 9 out of 10”, commented student S.

Level	Question	Extracts from Interview s
Reaction	Satisfaction with the Real-World Project	Majority of participants were mostly satisfied, finding the project fulfilling and meeting their expectations.
	Effectiveness and impact on time	Despite occasional disruptions to current projects, participants found the project manageable and worthwhile.
	Skill level of the Real-World Project	Tasks and challenges aligned with participants' abilities, resulting in valuable skill development. Some initially felt the project was outside their skill level but gained insights and increased their skills.
	Addressing needs	The project addressed participants' needs, contributing to their professional growth and development.
	Time duration	Most participants found the pace and delivery method suitable, but some desired more time for deeper exploration.
Learning	Motivation to pursue similar projects	The project sparked interest and motivation for further exploration, except for one person with a lack of interest in the topic.
	Recommendation to others	Participants would recommend the project to others, considering it valuable and meaningful.
	Skills learned compared to other skills	Participants primarily learned technical skills, some also highlighted the development of time management skills.
	Knowledge level before and after the project	Participants reported significant knowledge improvement after completing the project.
	Challenges	Technical topics posed challenges, requiring additional support from experts or industry connections.
Behavior	Application of learned skills to work	Acquired knowledge and skills were perceived as practical and relevant for participants' professional environments.
	Challenges faced	Challenges included technical topics and time management, emphasizing the need for better organization and prioritization.
	Roles in the team and company	Participants identified themselves in technical and project management roles, indicating a division of responsibilities within the team.
	Support and motivation	Participants felt supported and motivated, mentioning helpful staff members and a positive work environment.
	Work environment needs	While most participants had no specific comments, one suggested bringing in a domain expert for assistance.
Result	Learning from errors	Participants actively reflected on errors, using them as opportunities for improvement and learning.
	Achievement of project goals	Majority of participants agreed that the project aligned with their initial objectives and expectations, achieving their goals at the end.

Most importantly, the project had a significant impact on the personal and professional growth of the participants, empowering them to pursue future opportunities with a heightened sense of skills and self-assurance. The videos showcasing some of the students' works can be scanned in the QR code in Figure 2 below. These findings can be applied to other disciplines and academic levels, providing guidance for promoting hands-on learning and the application of knowledge in different contexts.



Moving forward, we plan to explore additional industry partnerships to enhance the authenticity and relevance of the projects. We will continue to evaluate and refine the implementation of real-world PBL based on feedback and emerging educational trends to ensure its continued effectiveness.

By implementing real-world PBL in multidisciplinary subjects, this study demonstrated the positive impact on student learning and outcomes, highlighting the benefits of practical projects. The insights and recommendations from this study provide valuable guidance for educators in various disciplines, shaping the development of effective and relevant educational programs that bridge the gap between academia and industry.