

OPPORTUNITIES AND CHALLENGES OF USING THE ENGINEERING EDUCATION DEGREE SHOW TO ENHANCE PROBLEM-BASED LEARNING

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Abstract: Organising an engineering education degree show is a challenge and a transformative opportunity. These events serve as a beacon of student innovation, a catalyst for industry-academia collaboration, and a spotlight on academic institutions. This concept paper takes the 2024 Mechanical, Energy, and Industrial Degree Show as a case study to unravel these complexities. While degree shows are mainly seen as a platform for students to showcase their technical skills and creativity, they also serve as a gateway for direct interaction between faculty, industry professionals, and potential employers, bridging the gap between academic knowledge and real-world application. Thus, this paper presents how an engineering degree show can potentially enhance the problem-based learning (PBL) initiatives at the university. While the benefits of such events are undeniable, their organisation requires meticulous planning and coordination. Similarly, graduating students also require different attributes to cope with the demands of a degree show organisation. The challenges, such as securing funding and sponsorship, engaging industry stakeholders, managing logistics, and supporting students in preparing their exhibits, are usually enormous. Additionally, promoting the event to attract a diverse audience and evaluating its success are critical components that require strategic execution. This concept paper assesses the degree show and unravels vital skills and competencies students gain from it, with a particular focus on how it promotes PBL outcomes. It suggests strategies to help future organisers and students assemble a successful degree show to enhance problem-based learning. By addressing these challenges, institutions can better prepare students for professional practice and foster stronger connections with industry. The solutions proposed in this concept paper can benefit other universities in organising and hosting successful degree shows. The article also introduces new perspectives on how engineering degree shows can effectively support problem-based learning outcomes.

Keywords: Engineering Education, Degree Show, Event Management, Academia-Industry Collaboration, Student Innovation, Project-Based Learning

1. INTRODUCTION

Organising an engineering education degree show involves numerous challenges and opportunities. These events showcase student innovations, foster industry-academia collaboration, and make academic institutions more visible (Ramírez-Mendoza et al., 2018). By demonstrating the institution's commitment to excellence in education and research, these events can attract prospective students, faculty, and funding opportunities (Hudspith, 2001). This article explores the inaugural degree show hosted by a relatively new university in Sub-Saharan Africa, offering a unique case study to understand the complexities of organising and staging such an important event. The study aims to expand the literature on project and problem-based learning, highlighting how degree shows can positively support these learning methodologies.

While many may consider degree shows as the output of the student's journey, this article will argue that it is more than just an event to showcase projects but a catalyst of the year-long meticulous process of conceptualising and manufacturing a significant project as a constellation of accumulated knowledge. Degree shows highlight the innovative projects and solutions developed by students, which can reflect the quality of education and research within the institution (Rajlich, 2010; Bourne et al., 2005). It is essential to provide a platform for students to demonstrate their technical skills and creativity through projects and presentations. The shows also allow students to apply theoretical knowledge in practical scenarios, demonstrating problem-solving skills (Vliet, 2005). They also provide a platform where students, faculty, industry professionals, and potential employers can interact, thus bridging the gap between academic knowledge and real-world application. Interaction with industry professionals can provide students valuable feedback and networking opportunities (Blake, 2003).

Despite their benefits, organising such events involves meticulous planning and coordination. These include securing funding and sponsorship, ensuring participation from industry stakeholders, managing logistics, and providing adequate student support in preparing exhibits. Additionally, promoting the event to attract a diverse audience and evaluating the outcomes to measure its success are critical components that require strategic thinking and execution. Addressing these challenges can prepare students for professional success and foster stronger connections with industry partners.

This concept paper analyses the challenges faced in organising the degree show and proposes solutions, offering insights that can enhance the planning and execution of similar events in the future.

1.1. Research Questions

1. What are the primary challenges and effective strategies in organising an engineering degree show?
2. How does the engineering degree show promote problem-based learning outcomes?

2. LITERATURE REVIEW

2.1. Degree show vs. engineering education

Engineering education degree shows are pivotal for showcasing student innovation, fostering industry-academia collaboration, and enhancing the visibility of academic institutions. Zavbi and Vukašinović (2014) highlight that academia-industry collaboration through project-based learning and teamwork is essential for building technical and professional competencies in engineering students (Zavbi & Vukašinović, 2014). Like degree show projects, Melsa, Rajala, and Mohsen (2009) discuss how initiatives such as the American Society for Engineering Education's (ASEE) projects help advance the scholarship of engineering education, fostering innovation and enhancing the global preparedness of engineering graduates (Melsa et al., 2009). The value of problem-based approaches is emphasised through initiatives like Serve-Learn-Sustain (SLS) at the Georgia Institute of Technology. Students embark on sustainability challenges through collaborations with community partners in projects, thus enhancing their problem-solving skills and real-world impact (Hirsch et al., 2023). Similarly, Aizpun, Sandino, and Merideno (2015) also present a university-industry collaborative approach, showing its benefits for students and industry through real-world projects and practical applications (Aizpun et al., 2015).

Previous studies emphasise that industry-academia collaborations facilitate shared knowledge creation and joint innovation. For example, Kunttu (2017) elaborate that collaborations effectively enhance learning and innovation development through mechanisms like student projects and tailored degree courses. Similarly, in Martins et al. (2014), the authors demonstrate that collaborative projects involving industry and academia significantly increase student motivation and practical experience. Nevertheless, some studies indicate that degree show events often face funding, logistical planning, stakeholder engagement, and resource management challenges. Smith and Jones (2019) state that effective event management in academic settings requires comprehensive planning, adequate funding, and active stakeholder involvement. Brown et al. (2020) emphasise the importance of industry partnerships in providing financial support and enhancing the quality of student projects.

Moreover, Soltani, Twigg, and Dickens (2012) conclude that it is essential for the industry to sponsor students and some degree programs to maintain a close relationship between students, academia and future employers, ensuring graduates possess the right skills and knowledge after graduation (Soltani et al., 2012). Therefore, the literature above emphasises the significance of the degree show in advancing engineering education.

2.2. Degree shows vs. Problem-based learning

Although engineering education degree shows are often taken as events rather than a semester-long process, they involve students tackling real-world problems, enhancing their problem-solving skills. According to Andersson (2012), students at the KTH Department of Machine Design develop product prototypes in close cooperation with industrial partners, which helps them understand the practical applications of their theoretical knowledge (Andersson, 2012). Integrating PBL in engineering courses improves student engagement and learning outcomes. Salleh and Yusof (2017) discuss how individual industrial PBL projects at Universiti Teknologi Mara Malaysia resulted in excellent grades and positive feedback from students and participating companies (Salleh & Yusof, 2017). Similar successes have been reported in Botswana. For example, Major and Mulvihill (2017) explored the effectiveness of PBL in teacher education and found that it significantly enhanced educators' ability to prepare students for real-world challenges. Likewise, Oladiran et al. (2009) documented the successful implementation of PBL in engineering education through international team projects, which helped students develop critical problem-solving and collaborative skills.

Therefore, it is clear that PBL, amongst other benefits, enhances various professional skills such as teamwork, communication, and project management. Gavin (2011) reports that PBL modules in civil engineering at University College Dublin developed students' problem-solving, innovation, group-working, and presentation skills, which employers highly value. These benefits are echoed by Oladiran and Uziak (2013), who noted that students in Botswana engaged in final-year engineering projects improved their practical and professional skills. PBL projects often involve collaboration with industry, providing students with insights into their future working environments and making their education more relevant to industrial needs. The benefits of these collaborations are highlighted by Kunttu (2017), who notes that such partnerships foster shared knowledge creation and innovation development (Kunttu, 2017). This is further evidenced by the work of Oladiran and colleagues, who have demonstrated that industry partnerships are essential for effective PBL, resulting in enhanced student learning outcomes and better preparation for the workforce (Oladiran et al., 2010).

Developing and testing prototypes is a crucial component of PBL in engineering education. Students gain hands-on experience, which is essential for understanding the design and manufacturing processes. This is emphasised by Andersson (2015), who found that using model-based design and actual prototypes significantly enhanced students' learning experiences. Oladiran et al. (2012) highlighted the importance of hands-on learning work on e-learning course delivery for mechanical engineering students in Botswana, noting the critical role of practical engagement in student success. Final year projects are integral to engineering education that employ PBL strategies. Thambyah (2011) discusses the design of learning outcomes for final-year projects, emphasising the importance of aligning these projects with industry needs and real-world applications. Literature on peer and self-assessment in group projects underscores the value of these capstone experiences in preparing students for professional practice (Oladiran et al., 2010).

While PBL offers numerous benefits, we cannot ignore the challenges, such as increased workload for students and faculty, the need for adequate resources, and effective integration into the curriculum. Kwan (2016) suggests careful planning and evaluation to address these challenges and maximise the benefits of PBL in engineering education. Oladiran (2011) supports this view, suggesting that PBL's successful implementation requires significant resource investment to ensure its effectiveness.

Therefore, in this article, we hypothesise that an engineering education degree show can effectively support, enhance and promote problem and project-based learning outcomes. Through real-world applications and industry collaboration, this approach enhances students' problem-solving skills, professional competencies, and readiness for industry challenges. However, effective management, resourcing and robust industry partnerships are essential to maximising their impact. To some extent, evidence shows that PBL integration in engineering education in Botswana has strengthened ties between academic institutions and industry, leading to more innovative and practical engineering solutions (Oladiran et al., 2009; Oladiran et al., 2010).

Nevertheless, more work still needs to be done to further cement PBL in engineering education, and engineering degree shows seem to be the answer to address the existing PBL challenges highlighted above.

3. METHODS

3.1. Report of the 2024 MEI Degree Show

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The analysis is based on the detailed report of the 2024 MEI Degree Show, which highlights the planning, execution, challenges, and solutions. Data was gathered through participant observations, student feedback, faculty and industry stakeholders, and financial records. The primary focus areas included funding and resources, venue and infrastructure, project quality and support, workforce for setup, promotion and branding, industry and alumni engagement, event timing, sponsorship acquisition, and internal coordination.

3.2. Likert Scale (Quantitative)

A questionnaire was distributed to the organising team of the 2024 Degree Show to gather feedback on their perspective of the organisational process. This included preparations leading up to the show, the day of the event itself, and activities post-event. Key areas of focus included funding and resource management, venue and infrastructure logistics, project quality and support, workforce allocation for setup, promotion and branding efforts, engagement with industry and alumni, event timing, sponsorship acquisition, and internal coordination. Using a Five-Point Likert Scale, the survey collected responses ranging from "Strongly Agree" to "Strongly Disagree." This quantitative data was then visualised in Likert charts presented in Figures 5-14. This presentation offers a comprehensive overview of the organisers' perceptions of the 2024 Degree Show. Table 1 details all the questions presented under each respective area.

Table 1: Qualitative analysis questions of the 2024 Degree Show.

Funding and Resources:
a) The university allocated enough funding and resources towards organising the 2024 MEI Degree Show
b) The department allocated enough funding and resources towards organising the 2024 MEI Degree Show
c) Funding and resources were effectively managed throughout the degree show.
Venue and Infrastructure:
a) The chosen venue was suitable for showcasing the projects presented in the degree show.
b) The infrastructure (e.g., lighting, display setups) was sufficient to enhance the show
c) Overall, the venue and infrastructure met or exceeded expectations.
Project Quality and Support:
a) The quality of the projects presented in the degree show was high.
b) Students were provided Adequate support and guidance when developing their projects.
c) Participants felt well-supported in showcasing their projects during the degree show.

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Workforce for Setup:
a) A sufficient workforce was available to set up and organise the degree show.
b) The setup process was efficient and well-coordinated.
c) Overall, there were no significant issues related to the workforce during the setup phase.
Promotion and Branding:
a) The degree show was effectively promoted to the target audience.
c) The branding and marketing efforts enhanced the visibility and attractiveness of the degree show.
c) Participants were satisfied with the level of promotion and branding for the event.
d) The show was highly attended
Industry and Alumni Engagement:
a) Industry professionals were adequately engaged in the degree show.
b) Alumni were adequately engaged in the degree show.
c) The involvement of industry added value to the degree show experience.
d) Participants found the interactions with the industry beneficial and enriching.
Event Timing:
a) The timing of the degree show was convenient for students
b) The duration of the event was appropriate for showcasing the projects.
c) Overall, the timing of the degree show was well-planned and executed.
Sponsorship Acquisition:
a) Sufficient sponsorships were acquired to support the degree show financially.
b) The sponsorship acquisition process successfully secured the necessary support.
c) The committee were satisfied with the level of sponsorship acquired for the degree show.
Internal Coordination:
a) Coordination among internal stakeholders (e.g., school, staff) was effective throughout the degree show.
b) Communication and collaboration within the organising team were well-managed.
c) Overall, internal coordination contributed positively to the success of the degree show.

4. FINDINGS

4.1. Funding and Resources

The results from the organising committee about the funding and resources used for the show are shown in Figure 1.40% strongly disagreed, 40% disagreed, 10% remained neutral, and just 10% agreed with the university's distribution of funds and resources for the 2024 MEI Degree Show. These numbers show that a sizable portion of r

espondents are not happy with the lack of funding from the university. A similar trend is observed regarding the department's allocation of resources and funding for the show. In the final section, respondents were asked about the effective management of funding and resources throughout the show, with 70% in agreement and 10% strongly agreeing with the prudent management of resources, while 10% remained neutral.

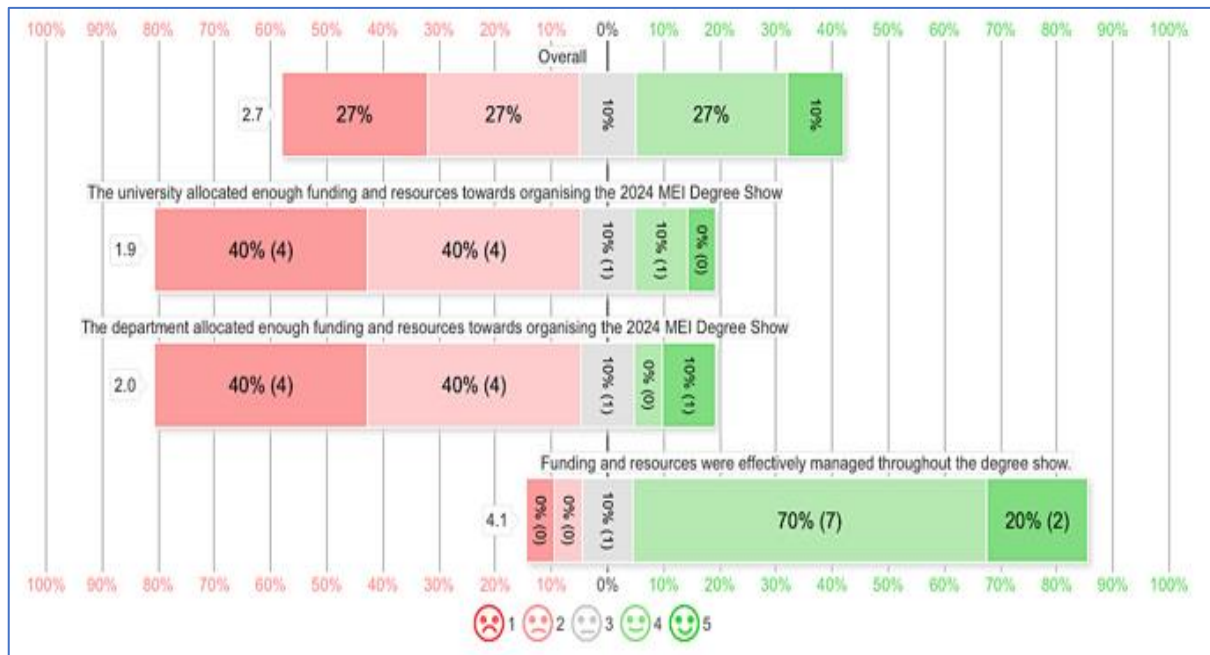


Figure 10. Funding and Resources.

4.2. Industry and Alumni Engagement

The responses from the organising committee regarding 'Industry and Alumni engagement' are depicted in Figure 2. A significant majority of respondents expressed agreement when asked whether industry professionals were adequately engaged in the degree show: 80% agree, 10% strongly agree, and only 10% disagree. Contrarily, when asked about Alumni engagement, a more significant portion of respondents indicated dissatisfaction with the level of engagement: 20% strongly disagreed, 30% disagreed, 20% are neutral, and only 30% agreed. Respondents also queried whether industry involvement added value to the degree of experience, with 100% agreeing. Most respondents perceived interactions with the industry as beneficial and enriching: 50% agree, 30% strongly agree, and 20% remains neutral.

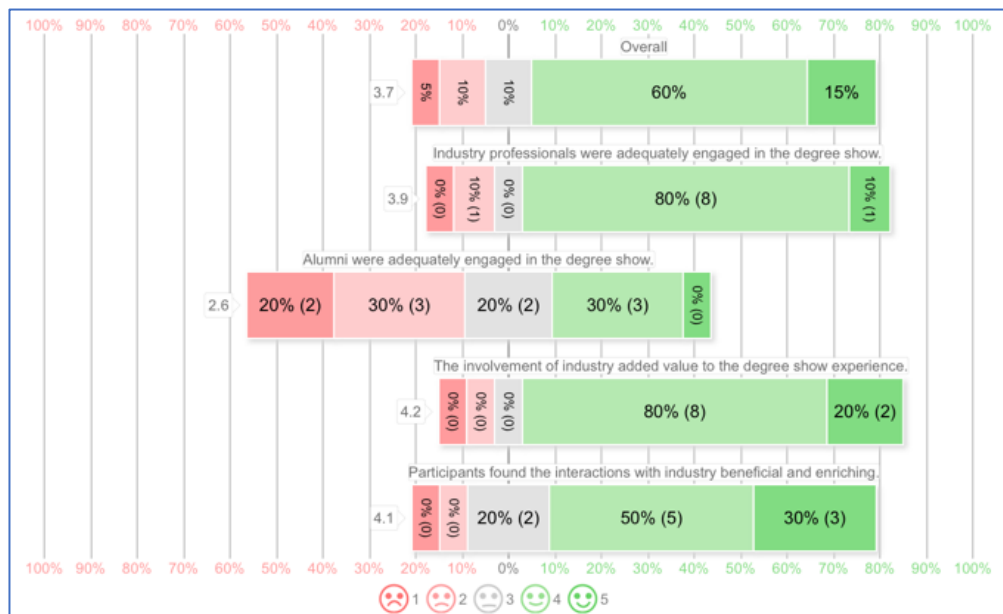


Figure 11. Industry and Alumni Engagement.

4.3. Internal Coordination

Figure 3 illustrates the committee's responses regarding internal coordination within the hosting institution's committee. Three specific questions were posed: (a) 'coordination among the internal stakeholders (e.g. school, staff) was effective throughout the degree show', (b) 'communication and collaboration within the organising team well managed' and (c) 'overall internal coordination contributed positively to the success of the degree show'. The data presented in Figure 3 indicate a predominant consensus among respondents across all three questions, with a minimum of 70% expressing agreement.

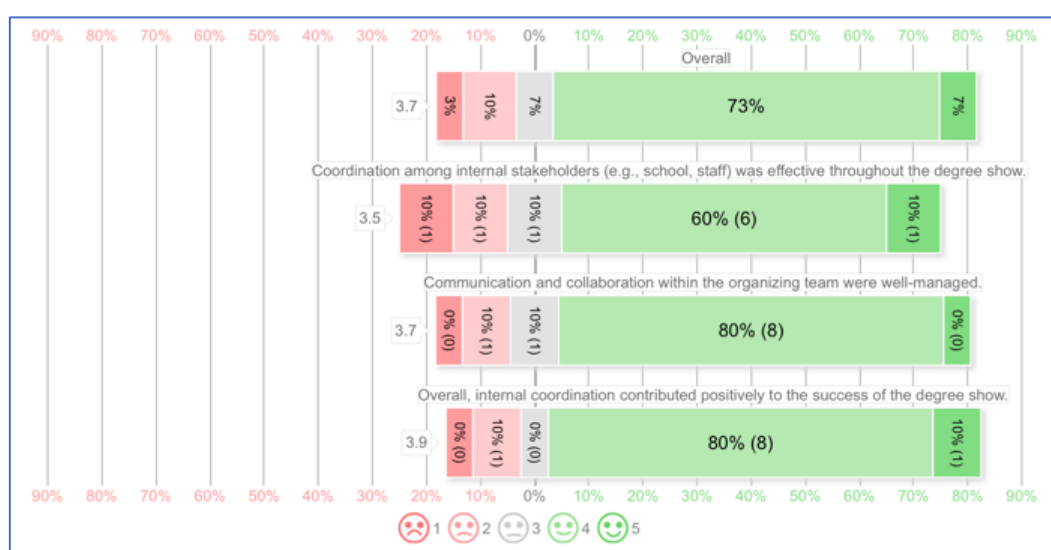


Figure 12. Internal Coordination.

4.4. Manpower Setup

The organizing committee was also surveyed regarding the adequacy of manpower for setup, with results presented in Figure 4. In response to the question of whether sufficient manpower was available for organizing the degree show, 22% strongly disagree, 22% disagree, 22% remains neutral, and 33% agree. Regarding the efficiency and coordination of the setup process, responses included 11% strongly disagree, 33% disagree, 11% are neutral, 33% agree, and 11% strongly agree. Finally, when asked if on 'overall, there were no significant issues related to manpower during the setup phase', 33% disagree, 33% strongly disagree, 11% remains neutral while 44% are in agreement. These results show that there was a shortage of manpower to help with the project stall setup.



Figure 13. Manpower for venue setup.

4.5. Project Quality and Support

Figure 5 presents the committee's responses regarding project quality and support provided to students in preparation for the degree show. Respondents were consistently aligned across all three questions. When asked about the quality of projects presented in the degree show, 80% agree, 10% strongly agree, and 10% remains neutral. Additionally, respondents were asked about the adequacy of support and guidance provided to students for their project development, with 40% agreeing, 20% strongly agreeing, 20% remaining neutral, and 10% in disagreement. Lastly, regarding whether participants felt adequately supported in showcasing their projects during the degree show, their responses are as follows: 50% agree, 20% strongly agree, 20% remains neutral, and only 10% strongly disagree. These results show that

students were adequately supported throughout the semester to complete their projects.

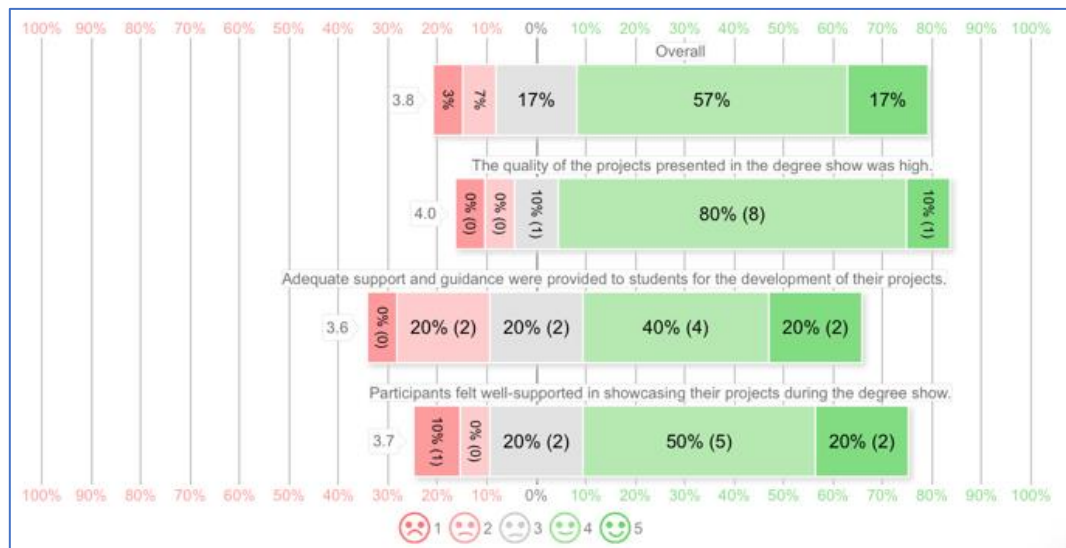


Figure 14. Project Quality & Support.

4.6. Promotion and Branding

The organizing team was also queried with a series of questions pertaining to 'promotion and branding', and the outcomes are summarized in Figure 6. In the first query, respondents were asked whether 'the degree show was effectively promoted to the target audience', 20% agree, 20% strongly agree, 20% remains neutral, and 40% disagree. The subsequent query focused on whether branding and marketing efforts enhanced the visibility and attractiveness of the degree show, with 50% in agreement, 10% strongly agreeing, 10% remaining neutral, 20% disagreeing, and 10% strongly disagreeing. In the third query, correspondents were asked whether 'participants were satisfied with the level of promotion and branding for the event', resulting in 50% agreement, 30% remaining neutral, and 20% disagreement. Finally, respondents were asked whether 'the show was highly attended, with 60% in agreement, 30% strongly agreeing, and only 10 disagreeing. These results show that promotion and branding activities were successfully executed.

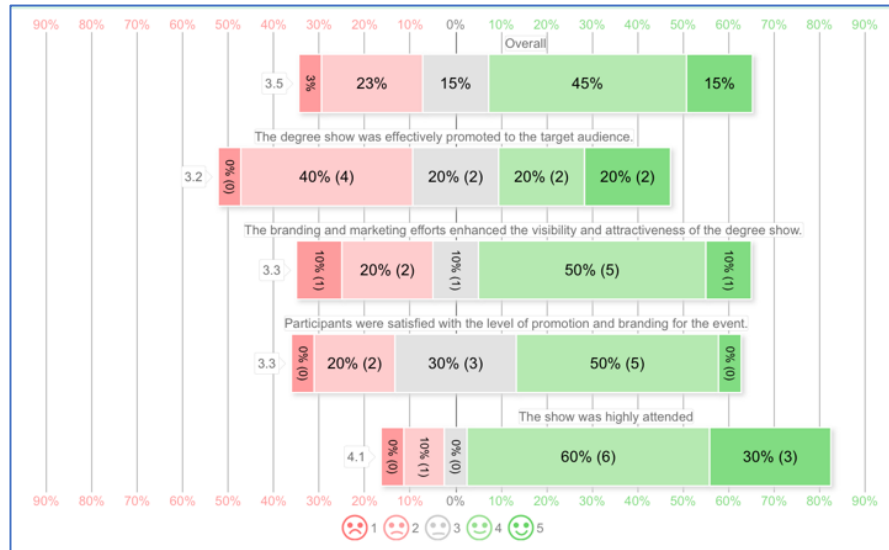


Figure 15. Promotion & Branding.

4.7. Sponsorship Acquisition

The committee was also queried about whether ‘sufficient sponsorship was acquired to support the degree show financially’. Results in Figure 7 show that 50% disagree, 20% strongly disagree, while only 20% agree and 10% strongly agree. Secondly, they were asked if ‘the sponsorship acquisition process was successful in securing necessary support’. Results indicate that 50% disagree, 10% remains neutral, while 30% agree and 10% strongly agree. Lastly, the committee was asked if they ‘were satisfied with the level of sponsorship acquired for the degree show’. Responses indicate that 40% disagree, 20% strongly disagree, 10% remain neutral, while 20% agree and 10% strongly agree. These results show that the sponsorship acquisition was inadequate. The committee targeted to raise BWP 200k but only managed to attract a quarter of the amount.



Figure 16. Sponsorship Acquisition.

4.8. Venue and Infrastructure

The organizing committee were queried on whether the chosen venue was suitable for showcasing the projects presented during the degree show. The results in Figure 8 indicate that 60% strongly agree, 30% agree, and 10% strongly disagree. Secondly, the committee assessed whether the infrastructure—such as lighting, displays, and setups—was adequate for enhancing the show. The results show that 30% strongly agree, 60% agree, and 10% disagree. Lastly, the committee was asked to evaluate whether, overall, the venue and infrastructure met or exceeded expectations. The results showed a similar trend: 60% agree, 30% strongly agree, and 10% remains neutral. These results show that although there was limited manpower to setup the venue and stalls, the committee was successful in setting up the venue to host the degree show.



Figure 17. Venue & Infrastructure.

4.9. Event Timing

Additionally, the committee was presented with three questions regarding the timing of the event. The first question enquired whether the timing of the event was convenient for the students. Results in Figure 9 show that 30% strongly agree, 30% agree, 20% disagree, and 20% remains neutral. The second question addressed whether the duration of the event was appropriate for showcasing the projects. The results indicate that 30% strongly agree, 50% agree, 10% strongly disagree, and 10% remain neutral. The final question asked whether the timing of the degree show was well-planned and executed. The results reveal that 20% strongly agreed, 50% agreed, 10% strongly disagreed, and 20% remained neutral. These results show that the timing of the show was appropriate.



Figure 9. Event Timing.

5. DISCUSSION

5.1. Degree show vs PBL

Our findings show that the degree significantly improves the problem-based learning process. Figure 10 shows key areas that lead to the success of a degree that promotes Problem-based learning. Unlike the common belief that degree shows are events rather than a process, we present our degree show framework in Figure 10 to highlight key factors that contribute to a successful PBL experience for students.

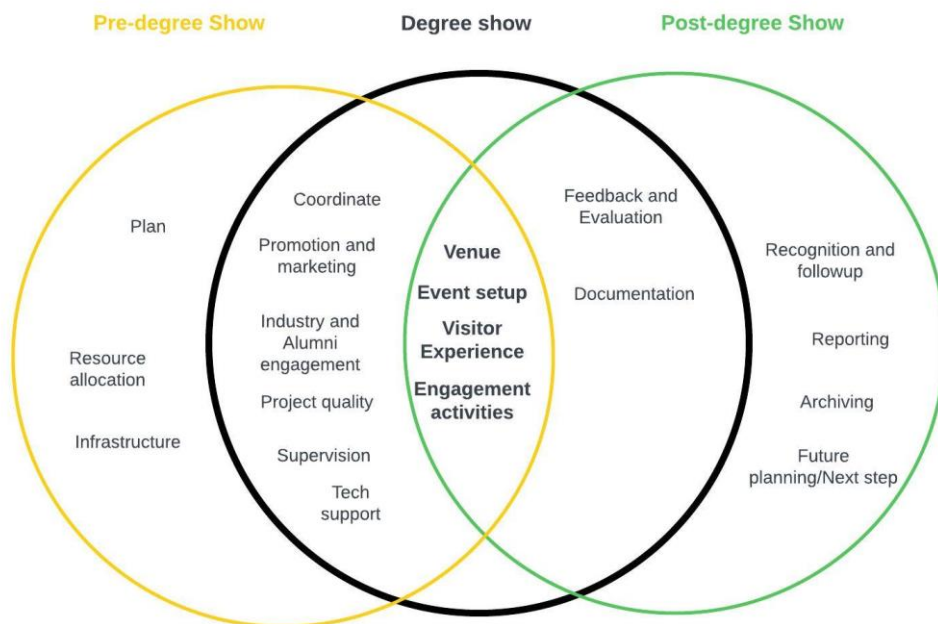


Figure 10. Degree Show Organisational Factors.

5.1.1. Pre-Degree Show

During the first semester, the organising committee, initially composed of the staff members, found it important to co-plan the event with students. Figure 10 illustrates that planning, resource allocation, technology support and infrastructure are the most important factors to consider early during the first semester. Our findings suggest that involving students during the planning stages helps them build skills in planning, resource allocation (budgeting), and infrastructural design. These skills are key in planning and organising engineering projects and events, which students cannot learn in normal classroom settings.

Regarding coordination and supervision, our study found that dividing students in different groups and allocating them roles, they were motivated and able to take responsibility in coordinating and supervising others. This coordination also included making follow-ups with the committee executive prior to the degree show event day. These findings add to what other authors reported with regard to how engaging with real-world activities outside the classroom motivate students and build key competencies to ready them for the industry (Hirsch et al., 2023; Aizpun et al., 2015; Soltani et al., 2012). Figure 10 also shows that involving students in promotion and marketing activities prior to the show is paramount. We found that students are more adaptive, creative and versatile to social media than staff members. Thus, to promote PBL, students were given tasks related to promulgating information about the show on social media platforms. This was important to hone promotion, marketing and problem-solving skills in them to take advantage of social media and learn how to use it for events professionally. Andersson (2012) supports our findings by reporting that real-world projects help students develop problem-solving skills through practical application of theory. More than 70% of respondents on our survey show that the pre-show coordination was satisfactory.

One other important aspect of the pre-degree show was engaging industry professionals and alumni. Although we did not get enough alumni participation prior to the show, we were able to engage industry partners towards the event day to help us with final preparations to the show. We observed that students were quite excited to engage with industry people, especially during the final setup of stalls and project preparations. This engagement was vital for students to practice their presentation skills before the show. This kind of interaction is key to helping students hone their presentation skills and confidence. Our findings are in line with Blake (2003), who emphasises how valuable degree show events are in promoting student-industry collaborations. Our results show that 100% of students interviewed indicate that industry involvement adds value to the degree show.

Supervision and project quality form the epicentre of the degree show. However, this has to be done pre-degree show. Thus, we found that it is important for students to be closely supervised to stay on course- throughout the semester to ensure that they deliver good-quality projects. Based on our findings, more than 80% of the students agreed that they had adequate support from the supervision team prior to the degree show. While supervisors are responsible for motivating and ensuring that students turn up at workshops, it is impossible for them to be always there for students. Thus, the honours lie with the students' self-motivation. We found that the degree show was another source of motivation for students to take their projects seriously because of its collaborative nature, thus agreeing with Martins et al. (2014), who argue that students are often motivated by collaborating with others. Therefore, the degree show helped students to collaborate, plan and coordinate their projects activities to produce good quality work.

As shown in Figure 10, there are other factors to be considered pre-degree show that lie at the centre, which must be done pre-degree show, during the degree show and post-degree show. During the pre-degree show, our study found that involving the students in venue selection and preparations, event setup in terms of project display, stage and sound system and sitting arrangements was paramount. We also found that it is important to consider visitors and other engagement activities that will take place during the show. Students gained experience and skills in organising and setting up stalls, stages, sitting arrangements and PA systems.

When evaluating the event and venue setup, more than 60% of the respondents agreed that it was satisfactory. We found that involving students enhances professional teamwork, communication, and project management skills. These findings agree with Gavin (2011) and Oladiran and Uziak (2013), who report that allowing students to collaborate with the staff, community and industry in organising the show develops students' problem-solving, innovation, group-working, and presentation skills, which employers highly value.

5.1.2. During Degree Show

On the day of the show, students presented their projects to the guest of honour and the public. This was a momentous experience for the students, where they gained experience and skills in pitching their ideas to potential investors and employers. This was a rare opportunity which they did not get during the normal teaching and learning process, thus accelerating and emphasising PBL. As a result, ninety (90%) of participants found the quality of projects on the showcase to be high, which positively advertised the students and their capabilities. This is emphasised by Andersson (2015), who found that using real prototypes significantly enhanced students' learning

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experiences. Furthermore, the show was a marketing vehicle through which the university could advertise its intellectual prowess, engineering degrees, and the quality of its eminent graduates.

As shown in Figure 10, although there are many factors indicated, students concentrated more on their project stalls during the degree show by engaging visitors and pitching their ideas, promoting and marketing their work, and collecting feedback. These interactions with visitors were key as students also gained experience by observing how industry partners displayed their merchandise and stalls, and streaming events live on social media and other events. The 2024 MEI Degree Show facilitated good interaction between industry and the university since 90% of participants were satisfied with the involvement of industry partners.

5.1.3. Post-Degree Show

During the post-degree show, students' involvement is minimal as indicated by the factors highlighted in Figure 10. However, some student's projects were further refined based on the feedback they got from the visitors and displayed in other venues, such as the BIUST spotlight event held in Mahalapye and the National Science week held in Tlokweng village. We found these post-degrees show events highly beneficial to students in emphasising problem-based learning since students could pitch their ideas to a larger audience further.

5.2. Improvement areas

The 2024 MEI Degree Show highlighted several critical areas for improvement in organising engineering education degree shows. Adequate funding and resource allocation are essential to ensure the quality and success of student projects. 70% of respondents are highly satisfied with how the organising committee managed funding and allocated resources for the show, despite 40% agreeing that both the department and the university did not adequately fund the show. Smith and Jones (2019) state that effective event management requires adequate funding. Oladiran (2011) supports these results by highlighting resource investment to ensure its effectiveness. This indicates that despite the limited funding of the show, the committee still managed to achieve the best results with the available funds.

Effective stakeholder engagement, including industry partners and alumni, can provide necessary support and enhance the event's impact. Over 50% of the respondents are dissatisfied with the number of alumni who attended the show. Since alumni are an important aspect of linking graduating students with industry expectations, there is a need for improvement in involving alumni.

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Scheduling the event at a less busy academic period can allow students to focus more on their projects. The 2024 MEI Degree Show could only run within the semester as students were due to write their final exams soon after and leave for the academic break. Therefore, the degree show was optimally timed to fit into the academic calendar. However, 20% of participants disagreed that the degree show was optimally timed, and this is because the show had to occur during the last week of teaching, during which most final assessments before the exam occur. This put too much strain on students, as they had to juggle their assessments with the degree show.

Moreover, explicit internal coordination and defined responsibilities can streamline the planning process, reducing delays and improving efficiency. At least 80% of respondents reported that neither the department nor the university funded the MEI 2024 Degree Show. This means the committee had to rely on external funding to finance the show. Despite this, at least 50% of the committee reports that the sponsorship acquisition process was not sufficient to secure funding for the show, and in fact, 60% are dissatisfied with the level of sponsorship acquired for the show. The committee, therefore, needs to improve its sponsorship acquisition process, and support from expert offices in the university is required. Support at the institutional level can prompt commitment from the offices that deal with sponsorship acquisition on behalf of the university.

The university provided the venue for the degree show, and participants found it highly suitable for hosting the show and showcasing students' projects. Both the infrastructure and the fixtures received a 90% satisfaction rate for suitability for hosting the show. Despite this, there are some (44%) dissatisfaction with the process of setting up the venue and the availability of manpower. More commitment from relevant offices is required to ensure that any issues are ironed out and the setup can happen seamlessly. Support at the institutional level can prompt the commitment required.

6. CONCLUSION

The main aim of this study was to explore the opportunities and challenges of using engineering degree shows to enhance problem-based learning. Our study found that engineering degree shows can successfully drive problem-based learning and build important skills and attributes such as problem solving, motivation, effective communication, innovation, and collaboration in students before they join the workforce. Nevertheless, we also found that organising an engineering education degree show involves multiple challenges that require strategic planning, resource management, and stakeholder engagement, amongst other factors. Thus, our study provides valuable insights into overcoming these challenges. The degree is a multidisciplinary endeavour and requires commitment from different actors.

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Recognition of the benefits of degree shows, not only for students and their faculty but also for the university-wide community, should motivate more robust support for degree shows. Support at the institutional level can circumvent reluctance to prioritise the show over other academic and university businesses.

Future degree shows can achieve tremendous success by addressing the identified issues and implementing the proposed solutions, benefiting students, faculty, and industry stakeholders. This concept paper can guide academic institutions to enhance their engineering education degree, which shows effectiveness and impact and accelerates problem-based learning outcomes.

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