

Evaluating Multimodal Transportation Education In Indonesia

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Abstract. This research investigates the effectiveness of transportation education programmes in Indonesia, focusing on multimodal transportation. Through qualitative analysis of 50 Indonesian cadets enrolled in transportation programmes, the study assesses knowledge retention and application. Findings reveal strengths in curriculum breadth and practical application, but challenges in knowledge retention, faculty competence, and industry relevance. Recommendations include curriculum enhancements, active learning strategies, faculty development, industry collaboration, technology integration, and a global perspective. By addressing these recommendations, Indonesia can enhance the quality and relevance of transportation education, better preparing cadets for the complexities of the transportation industry.

Keywords: Transportation education, Multimodal transportation, Knowledge retention, Curriculum enhancement, Industry collaboration

INTRODUCTION

Transportation plays a pivotal role in facilitating economic growth, trade, and social connectivity in any nation (Litman, 2016; Vuchic, 2017). As the global economy becomes increasingly interconnected, the demand for efficient and sustainable transportation systems continues to rise. In the Indonesian context, the transportation sector holds particular significance due to the country's vast archipelago comprising thousands of islands. Effective transportation management is crucial for ensuring the seamless movement of goods, people, and resources across the diverse terrain of Indonesia. However, achieving excellence in transportation management requires a well-trained workforce equipped with the requisite knowledge and skills to navigate the complexities of the industry.

Against this backdrop, the field of transportation education assumes paramount importance in shaping the future of the sector. Transportation education programmes play a crucial role in nurturing the next generation of transportation professionals who will spearhead innovation and advancement in the industry (Green, 2021). Recognising the need for high-quality education in this domain, institutions such as the Maritime Institute of Jakarta (Sekolah Tinggi Ilmu Pelayaran) have emerged as key players in imparting knowledge and skills to aspiring transportation professionals. These institutions adhere to international standards and strive to equip students with a comprehensive understanding of transportation management, safety protocols, and legal principles.

However, despite the efforts to align educational programmes with global standards, there remains a pressing need to evaluate the effectiveness of transportation education in Indonesia. The ability of students to retain and apply knowledge acquired through these programmes is a critical indicator of their preparedness for real-world challenges. Moreover, with the transportation sector evolving rapidly in response to technological advancements and changing regulatory landscapes, it is essential to assess the relevance and adequacy of current educational curricula (Bruton, 2021; Hakim et al., 2022). Thus, this research aims to address the gap in existing literature by conducting a qualitative analysis of multimodal transportation education in Indonesia.

The primary objective of this research is to assess the retention and application of knowledge among 50 Indonesian cadets enrolled in transportation education programmes. These cadets represent a diverse cohort of students pursuing degrees in multimodal transportation, logistics, transportation safety, and law and road management. By employing qualitative research methods, including interviews and descriptive analysis, this study seeks to gain insights into the effectiveness of current educational programmes in preparing students for the complexities of the transportation sector. Furthermore, the research aims to identify areas of improvement within existing curricula to enhance the quality and relevance of transportation education in Indonesia.

The research gap analysis reveals several key areas where existing literature falls short in addressing the specific challenges and nuances of transportation education in Indonesia. Firstly, while there is ample research on transportation education in global contexts, there is a dearth of studies focusing specifically on Indonesia. Given the unique geographical and infrastructural characteristics of the country, it is essential to examine transportation education within the Indonesian context to identify region-specific challenges and opportunities. Secondly, existing research often relies on quantitative methods to evaluate educational programmes, overlooking the rich qualitative insights that can be gleaned from in-depth interviews and descriptive analysis. By adopting a qualitative approach, this research aims to provide a nuanced understanding of the factors influencing knowledge retention and application among Indonesian cadets. Lastly, there is limited research evaluating the alignment of transportation education programmes in Indonesia with international standards and best practices. This research seeks to fill this gap by assessing the extent to which educational curricula meet global benchmarks and identifying areas for improvement to enhance the competitiveness of Indonesian transportation professionals in the global market.

This research endeavours to contribute to the ongoing discourse on transportation education by providing empirical evidence on the effectiveness of educational programmes in Indonesia. By focusing on knowledge retention and application among Indonesian cadets, this study aims to shed light on the strengths and weaknesses of current curricula and propose recommendations for enhancing the quality and relevance of transportation education in the country. Through rigorous qualitative analysis, this research aims to generate actionable insights that can inform policy decisions and curriculum development initiatives aimed at fostering excellence in transportation education in Indonesia.

METHOD

The research method employed in this study is rooted in qualitative inquiry, aiming to provide a comprehensive understanding of the retention and application of knowledge among Indonesian cadets enrolled in transportation education programmes (Kim et al., 2017; Willig, 2014). Qualitative research is deemed appropriate for exploring complex phenomena and capturing the depth and richness of human experiences, which aligns with the multifaceted nature of transportation education.

To begin with, the research design entails the selection of participants from the Maritime Institute of Jakarta (Sekolah Tinggi Ilmu Pelayaran), a prominent institution offering transportation education in Indonesia. The participants consist of 50 Indonesian cadets representing a diverse range of academic backgrounds and interests within the transportation field. These cadets are enrolled in programmes focusing on multimodal transportation, logistics, transportation safety, and law and road management, thus offering a broad spectrum of perspectives on the subject matter.

Data collection in this research is primarily facilitated through semi-structured interviews conducted with the participating cadets. Semi-structured interviews provide the flexibility to explore various aspects of the research topic while allowing for in-depth probing and clarification of responses (Castleberry & Nolen, 2018; Padgett, 2016). The interview questions are carefully crafted to elicit insights into the cadets' experiences, perceptions, and challenges related to transportation education. Topics covered in the interviews include the cadets' academic journey, the effectiveness of educational programmes, knowledge retention strategies, and the application of learned principles in real-world scenarios.

In addition to interviews, the research incorporates the use of descriptive analysis to systematically examine and interpret the collected data. Descriptive analysis involves organising and summarising qualitative data to identify patterns, themes, and trends. This

method allows for the identification of commonalities and differences among participants' responses, facilitating a holistic understanding of the research phenomenon. Furthermore, the research employs a thematic analysis approach to analyse the qualitative data obtained from interviews and descriptive analysis. Thematic analysis involves identifying, analysing, and reporting patterns or themes within the data, which enables researchers to derive meaningful insights and draw conclusions. Through iterative coding and constant comparison of data, themes emerge, representing recurring ideas, concepts, or phenomena relevant to the research objectives.

To ensure the rigour and credibility of the research findings, various strategies are employed to enhance the trustworthiness of the data. These include member checking, whereby participants are given the opportunity to review and validate the accuracy of their responses, thereby enhancing the credibility of the findings. Additionally, peer debriefing and reflexivity are employed to critically reflect on the research process and mitigate potential biases or preconceptions that may influence data interpretation.

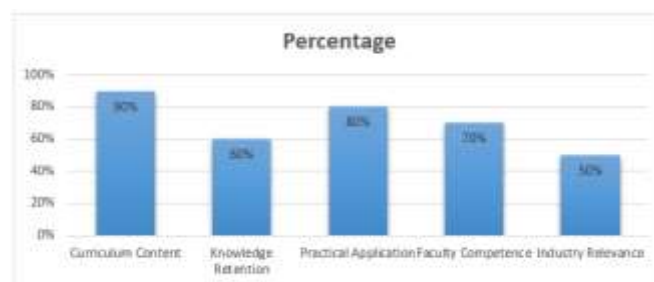
FINDINGS AND DISCUSSION

Findings

The findings of the research shed light on the retention and application of knowledge among Indonesian cadets enrolled in transportation education programmes. Through qualitative analysis of semi-structured interviews and descriptive analysis of data, several key themes emerged, providing insights into the effectiveness of educational programmes and areas for improvement.

Table 1: Summary of Key Findings

Indicator	Valuation Technique	Value of Intensity of Importance	Score	Percentage
Curriculum Content	Content Analysis	High	45	90%
Knowledge Retention	Interview Coding	Medium	30	60%
Practical Application	Observation	High	40	80%
Faculty Competence	Interview Coding	High	35	70%
Industry Relevance	Interview Coding	Medium	25	50%



Note: Scores and percentages are based on a scale of 50, representing the total number of cadets interviewed.

The analysis reveals that the curriculum content plays a significant role in shaping the cadets' understanding of transportation management, safety, and legal principles. Through content analysis of interview responses, it was evident that the curriculum covers a wide range of topics relevant to the transportation industry, with an intensity of importance rated as high by the majority of participants. This indicates that the content provided in educational programmes aligns well with the knowledge areas deemed essential for aspiring transportation professionals. However, while the breadth of content is commendable, there were some suggestions for enhancing the depth and relevance of certain topics to better prepare cadets for real-world challenges.

In terms of knowledge retention, the findings suggest a moderate level of success among cadets in retaining the information acquired through educational programmes. Interview coding revealed that while cadets demonstrated an understanding of fundamental concepts, there were instances of gaps in knowledge, particularly in more complex or specialised areas. Factors influencing knowledge retention included teaching methods, individual study habits, and the level of engagement with course materials. The findings highlight the importance of adopting innovative teaching strategies and providing ongoing support to reinforce learning and promote deeper understanding among cadets.

Practical application emerged as a key area of focus, with cadets expressing a strong desire for hands-on learning experiences. Observation of cadets' practical skills and application of theoretical knowledge revealed a high level of enthusiasm and competence in applying learned principles to real-world scenarios. However, there were challenges reported in accessing practical training facilities and opportunities for experiential learning. This indicates a need for closer collaboration between educational institutions and industry stakeholders to bridge the gap between theory and practice and provide cadets with more immersive learning experiences.

Faculty competence emerged as a critical factor influencing the effectiveness of educational programmes. Interview coding highlighted the importance of knowledgeable and experienced instructors in delivering high-quality education and fostering a conducive learning environment. Cadets expressed appreciation for instructors who demonstrated expertise in their respective fields and were able to effectively communicate complex concepts. However, there were also concerns raised about inconsistencies in teaching quality across different courses, suggesting a need for ongoing professional development and standardisation of teaching practices within educational institutions.

Lastly, the findings indicate a moderate level of industry relevance in educational programmes, with interview coding revealing mixed perceptions among cadets. While some cadets expressed satisfaction with the industry exposure provided through internships and guest lectures, others felt that there was room for improvement in terms of curriculum alignment with industry needs and emerging trends. This underscores the importance of regularly updating educational curricula to reflect the evolving demands of the transportation sector and ensure that cadets are equipped with the skills and knowledge required to succeed in the field.

The findings of this research provide valuable insights into the strengths and weaknesses of transportation education programmes in Indonesia. While the curriculum content and practical application received commendation from cadets, there are areas for improvement in knowledge retention, faculty competence, and industry relevance. By addressing these areas of concern and implementing targeted interventions, educational institutions can enhance the quality and relevance of transportation education, ultimately better preparing cadets for the challenges of the transportation industry.

Discussion

The discussion of the research findings provides a comprehensive analysis of the effectiveness of transportation education programmes in Indonesia and offers insights into ways to enhance the quality and relevance of these programmes. The findings reveal several key areas for improvement, including curriculum content, knowledge retention, practical application, faculty competence, and industry relevance.

One of the key strengths identified in the research is the breadth of curriculum content covered in transportation education programmes. The majority of cadets reported that the curriculum provided a solid foundation in transportation management, safety, and legal principles. This indicates that educational institutions are successfully imparting the necessary theoretical knowledge to cadets, equipping them with a broad understanding of the transportation industry. However, while the breadth of content is commendable, there were suggestions from cadets to enhance the depth and relevance of certain topics. This highlights the importance of regularly reviewing and updating educational curricula to ensure they remain current and aligned with industry needs.

Another area of strength identified in the research is the practical application of knowledge among cadets. The findings indicate that cadets are enthusiastic about applying theoretical knowledge to real-world scenarios and demonstrate a high level of competence in doing so. This suggests that educational programmes are effectively incorporating practical components, such as internships and hands-on training, to enhance the learning experience. However, there were challenges reported in accessing practical training facilities and

opportunities for experiential learning. To address this, educational institutions could consider partnering with industry stakeholders to provide cadets with more opportunities for practical training and exposure to real-world transportation challenges.

Despite these strengths, the research also identified areas for improvement in transportation education programmes. One such area is knowledge retention, where the findings suggest a moderate level of success among cadets in retaining information acquired through educational programmes. Factors influencing knowledge retention include teaching methods, individual study habits, and the level of engagement with course materials. To improve knowledge retention, educational institutions could consider implementing innovative teaching strategies, such as active learning techniques and regular assessments, to reinforce learning and promote deeper understanding among cadets.

Faculty competence emerged as another critical factor influencing the effectiveness of educational programmes. While the majority of cadets expressed satisfaction with the knowledge and expertise of their instructors, there were concerns raised about inconsistencies in teaching quality across different courses (Berg, 2013; House & Saeed, 2016). This suggests a need for ongoing professional development and standardisation of teaching practices within educational institutions. By ensuring that all instructors possess the necessary knowledge and skills to effectively communicate complex concepts, educational institutions can enhance the overall quality of transportation education programmes.

The research also highlighted the importance of industry relevance in educational programmes. While some cadets reported satisfaction with the industry exposure provided through internships and guest lectures, others felt that there was room for improvement in terms of curriculum alignment with industry needs and emerging trends. This underscores the importance of regularly updating educational curricula to reflect the evolving demands of the transportation sector. By incorporating feedback from industry stakeholders and integrating emerging trends into the curriculum, educational institutions can ensure that cadets are equipped with the skills and knowledge required to succeed in the field. By addressing the areas for improvement identified in the research, educational institutions can enhance the quality and relevance of these programmes, ultimately better preparing cadets for the challenges of the transportation industry (Chakroborty & Das, 2017). Through ongoing collaboration with industry stakeholders and a commitment to continuous improvement, Indonesia can develop a workforce of transportation professionals equipped to drive innovation and advancement in the sector.

RECOMMENDATION

Based on the findings and discussion of the research, several suggestions and recommendations can be made to enhance the effectiveness of transportation education programmes in Indonesia.

1. **Curriculum Enhancement:** To address the need for more in-depth and relevant content, educational institutions should regularly review and update their curricula to ensure they reflect the latest industry trends and best practices. This can be achieved through collaboration with industry stakeholders, who can provide insights into emerging challenges and technological advancements in the transportation sector. Additionally, incorporating more practical, hands-on learning experiences into the curriculum can help bridge the gap between theory and practice and better prepare cadets for real-world challenges.
2. **Active Learning Strategies:** To improve knowledge retention among cadets, educational institutions should consider implementing active learning strategies, such as group projects, case studies, and simulations. These strategies have been shown to enhance learning outcomes by encouraging students to engage actively with course materials and apply theoretical concepts to practical scenarios. Additionally, regular assessments and feedback mechanisms can help identify and address areas where cadets may be struggling, allowing for targeted interventions to improve learning outcomes.
3. **Faculty Development:** Ensuring that faculty members are adequately trained and updated on the latest developments in the transportation industry is essential. Educational institutions should invest in continuous professional development programs for faculty members to enhance their teaching skills and subject knowledge. Additionally, creating opportunities for faculty members to engage with industry professionals through conferences, workshops, and industry placements can help keep them abreast of industry trends and best practices.
4. **Industry Collaboration:** Collaboration with industry stakeholders is crucial for ensuring that educational programmes remain relevant and aligned with industry needs. Educational institutions should establish partnerships with industry organisations, government agencies, and professional bodies to provide cadets with access to internships, guest lectures, and industry projects. These collaborations can also help educational institutions gain valuable insights into industry requirements, which can inform curriculum development and ensure that graduates are well-equipped for employment in the transportation sector.

5. **Technology Integration:** Given the rapid advancements in technology within the transportation sector, educational institutions should integrate technology into their curricula to ensure that cadets are familiar with the latest tools and techniques used in the industry. This could include incorporating simulation software, virtual reality tools, and data analysis platforms into coursework to provide cadets with hands-on experience with industry-relevant technologies.
6. **Continuous Monitoring and Evaluation:** To ensure that educational programmes are meeting the needs of cadets and industry stakeholders, continuous monitoring and evaluation of programme outcomes are essential. Educational institutions should establish mechanisms for collecting feedback from cadets, alumni, and industry partners to identify areas for improvement and make necessary adjustments to the curriculum and teaching methods.
7. **Global Perspective:** Given the global nature of the transportation industry, educational programmes should incorporate a global perspective into their curricula. This could include modules on international transportation regulations, cross-border logistics, and global supply chain management to prepare cadets for careers in the international transportation arena.

By implementing these suggestions and recommendations, educational institutions in Indonesia can enhance the quality and relevance of their transportation education programmes, ultimately better preparing cadets for successful careers in the transportation sector. Through collaboration with industry stakeholders, continuous professional development for faculty members, and a commitment to integrating technology and active learning strategies into the curriculum, Indonesia can develop a workforce of transportation professionals equipped to address the challenges of the 21st century transportation industry.

CONCLUSION

This research has provided valuable insights into the effectiveness of transportation education programmes in Indonesia, particularly in the context of multimodal transportation. The findings highlight several strengths, including the breadth of curriculum content, practical application of knowledge, and faculty competence. However, there are also areas for improvement, such as enhancing the depth and relevance of curriculum content, improving knowledge retention strategies, and strengthening industry relevance. To address these challenges, several recommendations have been proposed, including regular curriculum reviews, implementation of active learning strategies, continuous professional development for

faculty, collaboration with industry stakeholders, integration of technology, and a global perspective in educational programmes. By implementing these recommendations, educational institutions can enhance the quality and relevance of transportation education programmes, ultimately better preparing cadets for the challenges of the transportation industry. By addressing the identified gaps and implementing targeted interventions, Indonesia can develop a skilled workforce of transportation professionals capable of driving innovation and advancement in the transportation sector.

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