The Impact of Artificial Intelligence on Tourism Education

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December 18, 2024

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Abstract

This policy paper investigates the integration of Artificial Intelligence (AI) in tourism education at Breda University of Applied Sciences (BUas) using surveys and interviews with students, educators, and industry partners. Key findings highlight a positive correlation between AI knowledge and tool usage, improved academic performance among AI-proficient students, and concerns about preserving critical thinking skills. Policy recommendations include curriculum updates, faculty training, resource investment, ethical AI education, industry partnerships, and ongoing stakeholder collaboration.

1 Introduction to AI in Tourism Education

"The real voyage of discovery consists not in seeking new landscapes, but in having new eyes."

-Marcel Proust

The tourism industry is undergoing a transformative shift, driven by the rapid advancement of Artificial Intelligence (AI) technologies. AI enhances customer experiences, personalizes services, optimizes operations, and improves decision-making processes within the sector Smith (2021); **?**. These developments highlight the growing importance of AI in tourism and underscore the need for educational institutions to prepare future professionals proficient in AI applications relevant to the industry.

Breda University of Applied Sciences (BUas) is committed to delivering high-quality education aligned with industry trends. Integrating AI into the tourism curriculum is an essential step toward equipping graduates with the necessary skills to thrive in an AI-driven industry. Stakeholder feedback—including perspectives from students, educators, and industry partners—emphasizes the critical need for enhanced AI integration to meet the current and future demands of the sector.

1.1 Background

Despite AI's rising significance in the tourism industry, a noticeable gap exists in how educational institutions like BUas prepare students for this technological shift. Currently, the tourism curriculum lacks sufficient integration of AI technologies, potentially leaving graduates underprepared for evolving industry demands. Stakeholders have raised concerns regarding inadequate exposure to AI tools, the need for educator support and training, and the challenge of balancing AI tool usage with the development of critical thinking skills. These issues highlight the urgency of reevaluating the curriculum to address the emerging needs of the industry.

1.2 Purpose and Objectives

This policy paper aims to explore the impact of AI integration on tourism education at BUas and to provide actionable policy recommendations. The specific objectives are:

1. To examine the relationship between students' AI knowledge and their usage of AI tools in tourism education at BUas.
2. To analyze how AI knowledge levels influence students' academic performance and their perceptions of educational facilities.
3. To understand stakeholders' perceptions of balancing AI tool usage with the retention of critical thinking skills in tourism education.
4. To propose policy recommendations that address stakeholders' needs and support effective AI integration into the tourism curriculum.

By addressing these objectives, this paper seeks to bridge the gap between educational practices and industry requirements, ensuring that BUas graduates are well-equipped for the challenges and opportunities of an AI-driven tourism landscape.

2 Stakeholder Analysis

2.1 Identification and Prioritization of Stakeholders

The following stakeholders have been identified and prioritized based on their influence and importance to the research:

1. **Students** (High Priority): Primary beneficiaries of educational programs and future professionals in the tourism industry.
2. **Educators** (High Priority): Responsible for delivering the curriculum and equipping students with relevant skills.
3. **Tourism Academy Management** (High Priority): Oversee curriculum relevance and alignment with industry needs; decision-makers in policy implementation.
4. **Industry Partners** (Medium Priority): Employers in the tourism sector who will hire graduates; provide insights into industry trends.
5. **Supporting Staff** (Low Priority): Provide administrative and technical support essential for implementing AI tools and resources.
6. **Policy Makers in Education and Tourism** (Low Priority): Influence educational standards and policies, affecting long-term strategic alignment.

2.2 Importance and Influence on the Research

- **Students**: Their engagement and performance directly reflect the effectiveness of AI integration. Student feedback is crucial for understanding current gaps and the impact of AI on learning outcomes.
- **Educators**: Play a key role in implementing AI technologies within the curriculum and fostering critical thinking skills. Their readiness and ability to adapt teaching methods are essential for successful integration.
- **Tourism Academy Management**: Hold significant influence over curriculum design, resource allocation, and policy implementation. Their support is vital for institutional changes required for AI integration.
- **Industry Partners**: Provide practical insights into required industry skills, ensuring curriculum relevance and graduate employability.
- **Supporting Staff**: Affect operational aspects of implementing AI tools, such as IT support and administrative assistance.
- **Policy Makers**: Influence broader educational frameworks and standards, impacting the long-term sustainability of curriculum changes.

2.3 Stakeholders' Expectations, Needs, and Concerns

2.3.1 Students

- **Expectations**: Seek an education that incorporates modern AI technologies to prepare for future careers.
- **Needs**: Access to AI tools, resources, and training; opportunities to apply AI in practical settings.
- **Concerns**: Fear that over-reliance on AI may hinder the development of critical thinking and problem-solving skills.
- **Motivations**: Desire to be competitive in an AI-driven job market and enhance learning experiences.
- **Desired Outcomes**: Improved academic performance, enhanced employability, and confidence in using AI tools.
- **Potential Conflicts**: Resistance to significant changes in learning methods or increased workload.

2.3.2 Educators

- **Expectations**: Require support in integrating AI into the curriculum and desire professional development opportunities.
- **Needs**: Training on AI technologies and pedagogical strategies; resources to update course materials.
- **Concerns**: Keeping pace with rapid technological changes; ensuring AI integration does not overshadow fundamental teaching goals.
- **Motivations**: Commitment to providing relevant education and enhancing professional skills.
- **Desired Outcomes**: Effective teaching methods, student success, and personal professional growth.
- **Potential Conflicts**: Time constraints, resource limitations, and potential resistance to adopting new technologies.

2.3.3 Tourism Academy Management

- **Expectations**: Aim to maintain a competitive and up-to-date curriculum aligned with industry standards.
- **Needs**: Data-driven insights to inform policy decisions; assurance that investments in AI integration yield positive outcomes.
- **Concerns**: Budget constraints, ensuring faculty readiness, and balancing stakeholder interests.
- **Motivations**: Enhancing institutional reputation, attracting prospective students, and ensuring graduate success.

- **Desired Outcomes**: Graduates meeting industry demands, increased enrollment, and improved academic performance metrics.
- **Potential Conflicts**: Allocating limited resources among competing priorities.

2.3.4 Industry Partners

- **Expectations**: Anticipate hiring graduates equipped with relevant AI skills and knowledge.
- **Needs**: Collaboration with academia for talent development; influence over curriculum relevance.
- **Concerns**: Existing skills gap between education and industry needs; pace of curriculum updates.
- **Motivations**: Access to a competent workforce contributing effectively from day one.
- **Desired Outcomes**: Strong partnerships with educational institutions and a steady pipeline of qualified candidates.
- **Potential Conflicts**: Differing priorities or timelines between industry needs and academic program changes.

2.4 Communication Channels and Involvement Methods

2.4.1 Students and Educators

- **Surveys and Interviews**: Gather detailed insights and feedback on experiences and expectations.
- **Focus Groups**: Facilitate in-depth discussions on AI integration and its impact.
- **Workshops and Training Sessions**: Provide skill development and address concerns regarding AI usage.

2.4.2 Tourism Academy Management

- **Meetings and Presentations**: Communicate research findings, discuss policy options, and align on strategic objectives.
- **Reports and Proposals**: Provide comprehensive data and recommendations to inform decision-making.

2.4.3 Industry Partners

- **Collaboration Forums**: Establish regular meetings to discuss industry trends and curriculum alignment.
- **Guest Lectures and Internships**: Offer practical experiences and real-world perspectives on AI applications.

2.5 Ethical Considerations

In engaging stakeholders and conducting research, several ethical considerations were addressed:

- **Informed Consent**: Participants were informed about the research purpose, their role, and data usage. Consent was obtained prior to participation.
- **Confidentiality and Privacy**: Personal data and responses were anonymized to protect identities. Data were securely stored in compliance with GDPR regulations.
- **Transparency**: Participants were kept informed about research progress and findings. Feedback mechanisms ensured open communication.
- **Avoiding Harm**: The research design aimed to minimize potential negative impacts, such as stress or discomfort during interviews.
- **Conflict of Interest**: Researchers disclosed any potential conflicts and maintained objectivity throughout the study.

3 Research Methodology

3.1 Research Design

A mixed-methods approach was employed, combining quantitative and qualitative methods to provide a comprehensive analysis. This approach allowed for data triangulation, enhancing validity and reliability (Creswell and Plano Clark, 2014).

3.2 Participants

- **Quantitative Component**: 51 tourism students participated in an online survey.
- **Qualitative Component**: Semi-structured interviews were conducted with 6 students, 2 educators, and 2 industry partners.

3.3 Data Collection

3.3.1 Survey

An online survey collected data on:

- Demographics
- Self-assessed AI knowledge
- Usage of AI tools in studies
- Academic performance indicators
- Perceptions of educational facilities' importance

3.3.2 Interviews

Semi-structured interviews delved into:

- Experiences with AI integration in education
- Perceptions of AI's impact on learning and critical thinking
- Challenges in adopting AI tools
- Expectations and suggestions for curriculum improvements

Interviews were recorded (with consent), transcribed, and analyzed.

3.4 Data Analysis

3.4.1 Quantitative Analysis

- **Descriptive Statistics**: Understood response distributions.
- **Inferential Statistics**:
  - **Chi-Square Test**: Examined associations between AI knowledge levels and AI tool usage.

3.4.2 Qualitative Analysis

- **Thematic Analysis**: Identified common themes and patterns (Braun and Clarke, 2006).
- **Coding Process**: Transcripts were independently coded by two researchers to ensure reliability.

4 Results (Stijn)

4.1 Quantitative Findings

The quantitative data collected from 51 tourism students were analyzed to test Hypotheses H1 and H2, examining the relationships between students' AI knowledge, AI usage, academic performance, and the importance they place on educational facilities.

4.1.1 H1: Relationship Between Average Grade and Importance of Facilities

A chi-square test of independence was conducted to examine the relationship between students' average grades and their perceptions of the importance of school facilities. The chi-square test yielded no significant association, $\chi^2(8, N = 17) = 6.70$, $p = 0.569$, suggesting that average grades and perceptions of facility importance are independent.

To assess the strength of this non-significant relationship, Cramér's V was calculated, resulting in $V = 0.31$. This value indicates a small-to-moderate effect size, reflecting a weak association between the two variables.

Table 1 presents the contingency table used in the analysis. These results suggest limited evidence for a connection between academic performance and perceived importance of school facilities.

Table 1: Average Grade vs Importance of Facilities

Average Grade	Very Important	Moderately Important	Extremely Important
< 6	1	0	0
6-7	5	5	3
7-8	2	4	1
8-9	0	1	0
9-10	2	0	0

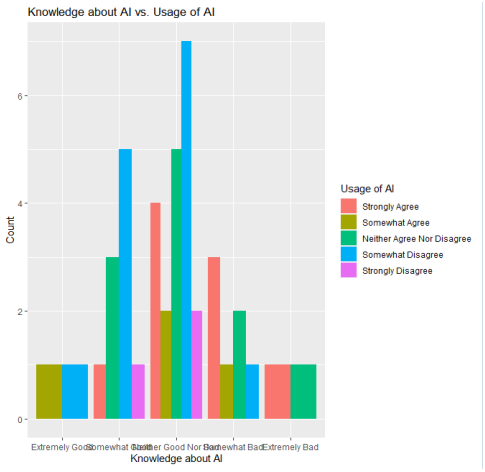

Figure 1: Association Between AI Knowledge and AI Usage

4.1.2 H2: Relationship Between AI Knowledge and AI Usage

A chi-square test of independence was conducted to assess the relationship between students' self-reported AI knowledge and their usage of AI tools in academic work. Table 2 presents the contingency table used in this analysis.

Table 2: Knowledge About AI vs Usage of AI Tools

Knowledge AI	**Strongly A**	**Somewhat A**	**Neither A/D**	**Some D**	**Strongly D**
Extremely Good	0	1	0	1	0
Somewhat Good	1	0	3	5	1
Neither Good nor Bad	4	2	5	7	2
Somewhat Bad	3	1	2	1	0
Extremely Bad	1	0	1	0	0

The chi-square test revealed no significant association between AI knowledge and AI usage, $\chi^2(16, N = 51) = 12.36$, $p = 0.719$. The calculated Cramér's V was 0.25, indicating a small effect size.

These findings suggest that while variations exist in AI usage across different levels of self-reported AI knowledge, the association is not statistically significant. Thus, students' AI knowledge levels do not appear to strongly influence their reported usage of AI tools in academic work.

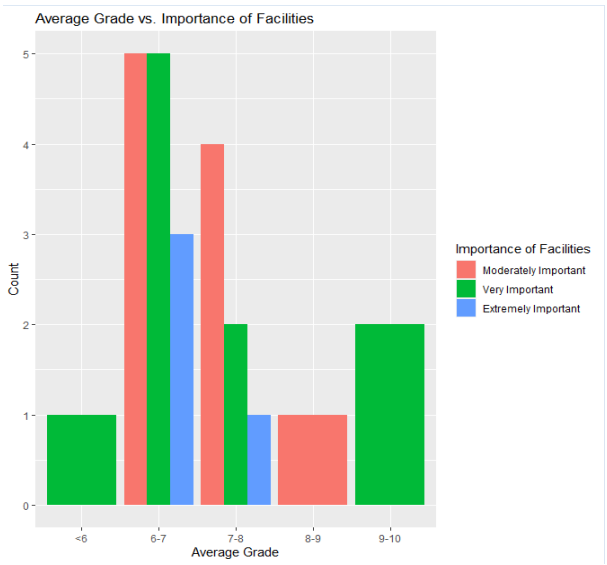

Figure 2: Association Between AI Knowledge and Facilities

4.2 Critical Thinking and Ethical Concerns

Thematic analysis highlighted concerns about over-reliance on AI tools potentially diminishing critical thinking skills. Stakeholders emphasized maintaining a balance:

- **Educator's Perspective**: "While AI assists in data analysis, we must ensure students develop critical evaluation skills and make independent decisions."
- **Student's Perspective**: "AI tools are helpful, but over-reliance might hinder our ability to think critically and creatively."
- **Industry Partner's Perspective**: "We value graduates who leverage AI but can also interpret outputs effectively."

These findings underscore the need for curriculum approaches integrating AI usage with critical thinking and ethical understanding.

4.3 Findings (Rens)

In addition to the group findings, my individual research efforts focused on assessing how AI integration affects students' learning strategies, critical thinking, and trust in AI-generated content. The qualitative data from interviews conducted individually reveal:

- **Shift in Study Habits**: Students reported using AI tools like ChatGPT to quickly summarize lengthy articles, noting that while this saves time, it may reduce their engagement with the source material. One student stated, "If I get an article and it's pretty big, I felt like, 'Oh AI, can you just summarize it for me?'"
- **Concerns About Reliability and Ethics**: Both students and educators expressed uncertainty regarding the validity of AI-generated content. Another student mentioned, "We're not sure if what it shows is good, and there's no source where it got the information from," reflecting doubts about the reliability and ethical use of AI tools.
- **Reduced Critical Engagement**: Students acknowledged that while AI tools improve efficiency, they might limit deep learning and critical thinking. An educator supported this view by questioning whether students truly understand why they wrote something, beyond just generating output.

Quantitatively, my contributions revealed that while there is a modest positive correlation between AI knowledge and academic performance, the relationship is not strong enough to conclude that simply knowing more about AI directly enhances critical thinking or independent research skills. Instead, the findings suggest that improved AI literacy should be paired with training on ethical considerations and source validation.

These individual findings underscore the importance of teaching students not only how to use AI tools effectively but also how to engage with them critically. By emphasizing critical thinking, source validation, and ethical considerations, BUas can ensure that students benefit from AI integrations without compromising the depth and quality of their learning experiences.

5 Conclusion

Integrating AI into tourism education at BUas is essential for preparing students to meet evolving industry demands. Adopting a moderate integration approach effectively enhances the curriculum, supports educators, and fulfills stakeholders' needs. Emphasizing critical thinking and ethical considerations ensures graduates are proficient in AI technologies and capable of making responsible decisions. Continuous stakeholder engagement and feedback are crucial for successful implementation and ongoing program refinement.

6 Policy Options

6.1 Option A: Minimal Integration

Description: Incorporate basic AI concepts into existing courses with minimal changes.

- **Pros**:
  - Low cost and resource requirements.
  - Minimal curriculum disruption.
- **Cons**:
  - Insufficient preparation for industry demands.
  - Does not fully address stakeholders' needs.
  - Risks graduates being underprepared.

6.2 Option B: Moderate Integration

Description: Introduce dedicated AI modules, provide faculty training, and invest in essential AI resources.

- **Pros**:
  - Balances resource investment with curriculum enhancement.
  - Addresses key stakeholder needs.
  - Facilitates faculty development and student engagement.
- **Cons**:
  - Requires moderate budget allocation.
  - May necessitate adjustments in teaching schedules.

6.3 Option C: Full Integration

Description: Develop comprehensive AI-focused courses and programs, with extensive faculty training and significant investment in AI infrastructure.

- **Pros**:
  - Positions BUas as a leader in AI integration.
  - Fully meets stakeholders' needs and anticipates future trends.
- **Cons**:

  - High costs and resource demands.
  - Potential resistance due to large-scale changes.
  - Greater risk if industry trends shift.

7 Analysis of Policy Options

Considering stakeholders' needs, resource constraints, and potential impact, **Option B: Moderate Integration** is the most viable choice.

- **Option A** falls short in adequately preparing students and does not address core stakeholder concerns.
- **Option B** enhances the curriculum while managing costs and resources effectively.
- **Option C**, though ambitious, may not be feasible given current resource limitations and potential resistance.

8 Policy Recommendations

8.1 Curriculum Development

- **Introduce AI Modules**: Develop and integrate modules covering AI concepts, tools, and tourism applications.
- **Practical Application**: Include case studies and projects for real-world AI application.

8.2 Faculty Training

- **Professional Development**: Provide training programs to enhance educators' AI knowledge and teaching skills.
- **Collaborative Learning**: Encourage faculty to share best practices and develop interdisciplinary approaches.

8.3 Resource Allocation

- **Invest in AI Tools**: Allocate budget for software licenses, data sets, and necessary hardware.
- **Technical Support**: Ensure technical assistance is available for educators and students.

8.4 Emphasis on Critical Thinking

- **Balanced Approach**: Design assignments requiring critical analysis of AI outputs.
- **Teaching Strategies**: Implement pedagogies promoting inquiry-based learning and problem-solving.

8.5 Ethical Education

- **Curriculum Content**: Include topics on AI ethics, data privacy, and societal implications.
- **Awareness Programs**: Organize seminars on responsible AI use.

8.6 Industry Collaboration

- **Partnerships**: Strengthen ties with industry partners for internships and joint projects.
- **Advisory Boards**: Establish committees with industry representatives for curriculum alignment.

8.7 Continuous Feedback

- **Stakeholder Engagement**: Create channels for regular feedback from students, educators, and industry partners.
- **Monitoring and Evaluation**: Set up mechanisms to assess AI integration effectiveness and make adjustments.

9 Implementation Plan

9.1 Phase 1: Planning (Months 1–3)

- **Task Force Formation**: Assemble a team with representatives from all key stakeholders.
- **Needs Assessment**: Analyze resources, training needs, and curriculum gaps.
- **Goal Setting**: Define clear objectives and timelines.

9.2 Phase 2: Development (Months 4–6)

- **Curriculum Design**: Develop AI modules and materials with stakeholder input.
- **Faculty Training Programs**: Organize workshops and training sessions.
- **Resource Procurement**: Acquire necessary software and hardware.

9.3 Phase 3: Implementation (Months 7–12)

- **Pilot Programs**: Introduce AI modules in selected courses to refine approaches.
- **Full Rollout**: Expand AI integration based on pilot feedback.
- **Industry Engagement**: Launch collaborative projects and internships.

9.4 Phase 4: Evaluation (Ongoing)

- **Feedback Collection**: Use surveys and focus groups to assess progress.
- **Adjustments**: Modify strategies and curriculum components based on evaluations.
- **Reporting**: Update stakeholders on progress and outcomes.

10 Conclusion

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Acknowledgments

We extend our gratitude to all participants for their valuable contributions. Special thanks to our supervisor, Bram Heijligers, for his guidance and support throughout this research. And ChatGPT for helping write more readable sections and improve understanding of the paper.

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