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Consciousness Toward Environmental Sustainability, Tourism Education, and the Dunning-Kruger Effect

Abstract

Attending to the challenges to tackle environmental sustainability concerns is a major issue in today's tourism industry. What is more, tourism education can positively influence tomorrow's workforce by educating them about environmental sustainability. It should be considered a focus area and key component when developing undergraduate tourism management programs. The study aims to examine the correlation between factors of knowledge, attitude, behavioral control, and intention toward environmental sustainability using the year of study as a moderator. A sample of 785 undergraduate students was used to statistically assess the relationship and develop a conceptual model as a basis to discuss the empirical results. The article concludes by presenting implications for educators, policymakers, and higher education institutions.

Keywords: environmental sustainability, Dunning-Kruger effect, tourism education, perceived behavioral control, environmental consciousness

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1. Introduction

Environmental sustainability is a well-articulated and multifaceted topic that is intensively debated across various fields and streams of literature (Alhawari et al., 2021; Han, 2021). In its current form, tourism development is not environmentally sustainable (Peeters & Landré, 2011). Tourism education is at the forefront of influencing environmental sustainability extensively by educating tomorrow's tourism stakeholders (Sheldon et al., 2011; Teruel-Serrano & Vinals, 2020; Fuchs, 2021). Moreover, tourism education is instrumental in supporting students to achieve the professional and practical skills required by the tourism sector (Cooper & Shepherd, 1997; Ndou et al., 2019). The evaluation of educational activities is inextricably linked to advancements in the development of sustainability activities in many areas of higher education institutions (Figueiró & Raufflet, 2015; Lozano et al., 2017). There is a certain interest in increasing students' awareness of more sustainable education, which will in turn increase knowledge on this important topic (Rickinson & McKenzie, 2021). Thus, environmental sustainability is an important topic to address within any business curriculum, let alone its significance to tourism education (Millar & Park, 2013).

A recent study by Fuchs (2021) revealed a significant relationship between the academic performance of undergraduate students in tourism and their perceived knowledge about environmental sustainability. Moreover, Levine and Strube (2012) suggest that "knowledge about the environment and attitudes influence behavior" (p. 308). Consequently, the study aims to re-examine if students' knowledge of environmental sustainability positively influences their attitude, behavioral control, and intention toward environmental sustainability. Décampes et al. (2017) and Hamón et al. (2020) suggest that students' knowledge of environmental sustainability

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improves as they progress with their studies. In such a case, it can be hypothesized that elderly students have a higher consciousness than their younger peers as implied by Levine and Strube (2012). While the core concept of education for sustainability is not new (Paris, 2016), it has been gaining momentum with the introduction of the sustainable development goals (SDG) by the United Nations that calls for (Harchandani & Shome, 2021).

A reoccurring theme in the perception of knowledge in tourism education is the Dunning-Kruger effect. Koc (2021) states that “people who may be incompetent in terms of certain skills and abilities tend to be unable to make correct judgments as they lack the skills to recognize correct judgment” (p. 175). In practice, this manifests in the lowest-performing participants, who often inflate or overestimate their skills and competencies, while participants who perform well tended to underestimate their abilities and performance (Mehmet et al., 2021; Koc, 2021). Therefore, the year of study will be utilized as a moderator (Adomako et al., 2019) to further test this hypothesis. It is important to understand what factors positively contribute toward sustainable development in general, and environmental sustainability specifically (Rickinson & McKenzie, 2021). Students are important stakeholders to achieve sustainable development, but equipping them with the right mindset and skills remains a challenge (Hamón et al., 2020).

2. Methodology

This study measures the attitude toward environmental sustainability of tourism undergraduate students with seven statements that were adapted from Kagawa (2007) and Swaim et al. (2014). Five statements to assess behavioral control were adapted from Swaim et al. (2014). Intention and knowledge were assessed with four items each, which were adapted from Swaim et al. (2014) and Fuchs (2021). The exact statements were modified to fit the context of this study. Content validity was justified in four subsequent steps. First, three scholars from the field of tourism were asked to perform an item-objective congruence (IOC) (Turner & Carlson, 2003). Next, the questionnaire was tested for comprehension with a limited sample of ten students. Both resulted in minor adjustments of the statements to fit the context of the study.

Finally, two dummy statements (Q6 & Q16) were removed and the Cronbach’s alpha coefficient was determined for each factor (attitude, behavioral control, intention, and knowledge) ranging from .74 to .88 indicating high reliability of the research instrument (Raykov & Marcoulides, 2019). A trilingual online questionnaire (Chinese, Thai, and English) was utilized to obtain responses from tourism undergraduate students in Thailand and P.R. China between October and November 2021. The students were able to express their agreement or disagreement on a seven-point Likert-type scale (Joshi et al., 2015) ranging from 1 (strongly disagree) to 7 (strongly agree) resulting in a total of 785 eligible responses that were included in the analysis.

3. Results

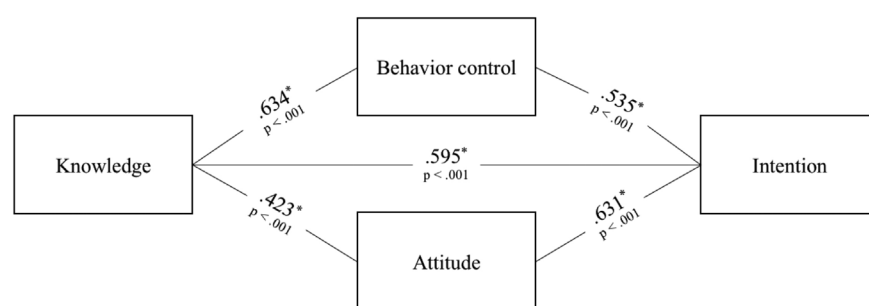
Table 1 reports the independent t-test results comparing four factors between younger freshmen tourism students (first-year) and their elderly peers (second to fourth-year). Overall, three factors demonstrate statistical mean differences including attitude, behavioral control, and intention, while no statistically significant mean difference was observed for the factor knowledge. The results illustrate that the younger students have higher mean levels of attitude ($t = 5.168$, mean = 6.440) and intention ($t = 5.375$, mean = 5.807) as compared with their elderly peers (means = 6.201 and 5.424 respectively). On the contrary, the results demonstrate a lower mean value for the freshmen students in behavioral control ($t = -3.161$, mean = 5.022) compared to students in their second to fourth year (mean = 5.251). Last, there was no statistically significant difference observed in the factor knowledge, which was almost identical for both groups ($t = -1.068$, mean difference -.075).

Table 1
Independent T-test of differences in factors of attitude, behavioral control, knowledge, and intention amongst freshmen and senior students

Factor	Mean scores		T-Test		
	Year 1 (n = 390)	Years 2-4 (n = 395)	T	p	Mean difference
Attitude	6.440	6.201	5.168	< .001	.239
Behavioral control	5.022	5.251	-3.161	.002	-.229
Knowledge	5.222	5.297	-1.068	.286	-.075
Intention	5.807	5.424	5.375	< .001	.383

Subsequently, Figure 1 reports the correlation between the factor knowledge toward behavioral control ($r = .634$, $p < .001$), attitude ($r = .423$, $p < .001$), and intention ($r = .595$, $p < .001$). Furthermore, the correlation between behavioral control toward intention ($r = .535$, $p < .001$) and attitude toward intention ($r = .631$, $p < .001$) is illustrated. The results show a moderate to strong correlation with a high statistical significance for the relationship between knowledge toward behavioral control, as well as an attitude toward the intention. The relationships between knowledge–attitude, knowledge–intention, and behavioral control–intention indicate a moderate relationship consistent with the interpretation based on Akoglu (2018).

Figure 1
Pearson's correlation (r) model indicates the different levels of strength between the factors of attitude, behavioral control, knowledge, and intention



4. Conclusions and implications

It is the aim of the study to re-examine if students' knowledge of environmental sustainability positively influences their attitude, behavioral control, and intention toward environmental sustainability using the year of study as a moderator. First, it can be stated that the results of the study demonstrate strong factual evidence that knowledge, attitude, and behavioral control influence intention toward environmental sustainability. Moreover, the critical role of knowledge in the context of consciousness toward environmental sustainability was affirmed through the study. The results of the study are on par with previous research (Swaim et al., 2014; Décamps, et al., 2017; Hamón et al., 2020; Rickinson & McKenzie, 2021) and confirm that behavioral control and attitude positively influence intentions toward environmental sustainability (Swaim et al., 2014).

However, the study contributes by identifying that knowledge can be seen as an accelerator that positively influences behavioral control, attitude, and directly the intentions of students. To efficiently improve students' knowledge, the commitment of faculty and academics is needed to foster transformation in learning and education for sustainability (Leal Filho et al., 2018). Furthermore, it is important to acknowledge that attitude and intention deteriorated as the students progressed with their studies. Although, the contributing factors that led to this reduction in mean scores remain unknown. A succeeding inquiry through semi-structured

interviews would be able to shed more light on the “why” and “how” (Busetto et al., 2020). Moreover, it is noteworthy to add that the self-reported factor knowledge was consistent throughout all four years.

In absence of a knowledge-based test, which would assess students’ knowledge of environmental sustainability and reduce bias in the results, it could be hypothesized that the students did improve their knowledge as they progress with their studies. However, their perceived knowledge was reported as more modest in subsequent years based on the Dunning-Kruger effect (Dunning, 2011; Mazor & Fleming, 2021). The effect causes them to overestimate their competence, wherein in subsequent years the students’ knowledge improved, but also their competence to more accurately assess their perceived knowledge (Koc, 2021). Ultimately, the study results generate implications directly for higher educational institutions and policymakers emphasizing the importance of general education toward environmental sustainability. As highlighted by Alba-Hidalgo et al. (2018), knowledge-based learning can be implemented in a variety of different ways to motivate undergraduate tourism students and engage them in activities that support the environment.

For example, implementing pedagogical activities to raise awareness and foster knowledge is critical to improving consciousness toward environmental sustainability in higher education (O’Flaherty & Liddy, 2018). Social media is noted as another tool with the potential to positively influence students’ sustainability practices (waste management, recycling, or water/electricity consumption) by engaging them in environmental matters (Hamid et al., 2017). Similarly, Janakiraman et al. (2018) identified that game-based learning can be used to facilitate attitude change for environmental sustainability and “leverage students into environment-friendly behaviors over time” (p. 176). Comparable to the results of this study which affirmed that knowledge about environmental sustainability serves as an incubator for improved attitudes and intentions.

Finally, the study contributes to the emerging body of knowledge on perceptions toward environmental sustainability, and more specifically, how tourism students perceive this important topic. The findings substantiate the important role of behavioral control in managing environmental sustainability efforts and corroborate that the implementation of knowledge-based assessment is an impact factor to consider for curricula development in tourism education. Lastly, the results of the study open avenues for future research that need to be further explored empirically.

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