Promoting sustainable learning among accounting students: evidence from field experimental design

Noor Ul Hadi
Human Resource Management, Prince Mohammad Bin Fahd University, Al Khobar, Saudi Arabia, and
Assim Ibrhaim Abdel-Razzaq
Department of Accounting, Prince Mohammad Bin Fahd University, Al Khobar, Saudi Arabia

Received 6 March 2023
Revised 3 June 2023
13 July 2023
13 September 2023
Accepted 16 September 2023

Abstract

Purpose – Several studies have attempted to explain the integration of sustainable development in business school curricula. However, little is known about who (male students vs female students), at which age (under 21, 21–25 and 26–30) and at which stage of their undergraduate education (freshman, junior or senior) can attain and retain an adequate understanding of sustainability in accounting education. For this reason, the present study aims to investigate the students' interest in sustainability in accounting with respect to their demographic factors.

Design/methodology/approach – The study used a quantitative research design where data were collected at a single point in time. Further, an independent sample *t*-test, one-way ANOVA and factorial design were performed on 132 responses conveniently collected from accounting students in the College of Business Administration (COBA) at Prince Mohammad Bin Fahd University (PMU) in Al Khobar, Saudi Arabia.

Findings – The study found no differences between the attitudes of male and female students toward sustainability in accounting education. Similarly, no statistical differences were found in the three age categories identified in this study. However, significant results were found throughout the different academic classifications (seniority): freshman students, junior students and senior students. Further, differences in the mean scores for freshman and junior accounting students were different between the male and female students, indicating that both male and female senior students' attitudes toward sustainability in accounting education were higher than those of male and female freshman and junior accounting students. The study concluded that students achieve an adequate understanding of sustainability in accounting education related to the relativism category of the Perry model of intellectual development.

Originality/value – Literature on attitude of students toward sustainability in education, specifically accounting education, is questionable and needs further exploration. This is due to the fact that only a small number of accounting students have been exposed to sustainable accounting education. Similarly, a recent study found a significant deficiency in sustainable accounting education in four Saudi Arabian universities, with only 4.5% of respondents knowing the comprehensive definition of sustainable development and 88% respondents having very low to low familiarity with the term sustainability.

Keywords Sustainable development, Sustainability in accounting education, Demographic factors, Curricula, Sustainable development goals

Paper type Research paper

Introduction

Education for sustainable development (ESD), a fourth pillar of sustainable development, was recently introduced by Biasutti and Frate (2017). Their findings suggest that ESD will help students with regards to environmental protection, social justice and economic viability. Since education is a critical predictor of human development (Dias *et al.*, 2022), students with sustainable knowledge, skills and abilities can achieve a more sustainable future (Koskela and Kärkkäinen, 2021). However, Mburayi and Wall (2018) concluded that

Higher Education, Skills and Work-Based Learning
Vol. 14 No. 2, 2024
pp. 479-491

2042-3896
DOI 10.1108/HESWBL-03-2023-0058

"*greening of accounting and finance curricula lag behind the development made in other disciplines*" (301). Sharma and Kelly (2014, p. 132) posit that sustainability in accounting education is key to sustainable development; therefore, without sustainable education in accounting, it would be difficult to implement and report sustainable business practices. Similarly, Creel and Paz (2018) suggested that companies have adopted the "Triple Bottom Line;" therefore, sustainable development is crucial, and higher education institutions (HEIs) need to bridge this gap by successfully integrating the principles of sustainable development in accounting curricula in order to maintain the present for the benefits of future. Unfortunately, so far, a narrow aspect of sustainability has been integrated into the curricula of accounting. Consequently, a small number of accounting students have been exposed to sustainable accounting in higher education. On the other hand, the literature on attitude of students toward sustainability in education, specifically in accounting education, is questionable and need further exploration.

In their comprehensive study, Ebaid (2021) found a deficiency of sustainable accounting education in four Saudi Arabia universities, with only 14 (4.5%) of respondents knowing the comprehensive definition of sustainable development and 88% of respondents having very-low to low familiarity with the term sustainability. Based on mean analysis, Abu-Alruz *et al.* (2018, p. 68) found that science students' have a divided attitude toward the three pillars of sustainable development (environmental, society and education), whereas the students' attitudes toward society and education were positive, but their attitudes toward the environmental aspect were negative. The results may be questionable because mean is not an appropriate measure for interpretation because variation in each data set may affect the interpretation of the mean score. Equally, in their study, Eugenio *et al.* (2022) could have been more specific if they further explored the gender and age variables. Their study is not that specific related to what exactly the intention of male and female students was related to engaging in sustainable accounting education. Also, the three categories of age (Group 1:17–22, Group 2: 23–28 and Group 3: > 40) are not appropriately analyzed to confidently and precisely interpret which age category of respondents intend to engage in sustainable accounting education. We also found that the results of Ebaid (2021) are very general with respect to students' age, gender and seniority. The studies reviewed thus far overlooked the attitude of accounting students toward sustainability in accounting education with respect to their demographic characteristics. Therefore, the current study will answer; who (male students vs female students), at which age (under 21, 21–25 and 26–30) and which stage of their undergraduate education (freshman, junior or senior) can attain and retain an adequate understanding of sustainability in accounting education under the rubric of the *Perry model of intellectual development*.

The study contributes to sustainability principles in the following ways: Firstly, it bridges the gap that exits between HEI actions and organizations' expectations (legitimacy perspective). Secondly, only 4.5% of respondents in Saudi Arabia universities know the comprehensive definition of sustainable development. The current study aims to enhance the students' understanding of sustainability in accounting education in the Saudi Arabia. Thirdly, we address the significantly neglected gap on empirically testing attitudes of accounting students toward sustainability in accounting with respect to the students' demographic characteristics. Moreover, we add sustainability aspect to *Perry Model of Intellectual Development* and propose teaching methods for teaching sustainability in higher education accounting programs.

Literature review

Theoretical background

The background of the current study comes from the Perry model of intellectual development. According to Perry (1970), students' attitudes toward courses vary.

He grouped nine levels into four categories (dualism, multiplicity, relativism and commitment to relativism). Dualism is the immature stage of development; students at this stage are dependent on professors and other authorities to provide correct answer. At this stage, the students' intellectual job is to memorize the answer provided by authority figures (e.g., professors, lectures, instructors). At the multiplicity stage, the students start to use supporting evidence to support their arguments; however, students are often still bias. At the relativism stage, students use evidence to reach their conclusions, so the dependency on authority figures has often converted to critical evaluation. Commitment to this stage will lead to thinking beyond authority figures; thereby, developing their own conclusions. Thus, mature male and female accounting students in their higher level of undergraduate studies may have a positive attitude toward sustainability in accounting education, likely resulting in positive changes in students' sustainable learning. Because attaining an adequate understanding of sustainability in accounting education takes time and critical thinking skills, it is more likely possible at commitment stage.

Education for sustainability development

Education for sustainable development (ESD) emerged to respond to the need for an education system that encourages changes in knowledge, skills, values and attitudes in order to evolve into a more sustainable society (Alexander *et al.*, 2018; Zeegers and Francis Clark, 2014; Yuan and Zuo, 2013; Barth and Timm, 2011). The ultimate goal of ESD is to empower and equip current and future generations to meet their personal and professional needs by achieving a balance between economic, social and environmental dimensions of sustainable development (UNESCO, 2021). ESD is the target 8 of the United Nation's (UN's) Sustainable Development Goal (SDG) number 12. Target 12.8 states, "By 2030, people everywhere will have the relevant information and awareness for sustainable development and lifestyles in harmony with nature" (United Nations, 2017). In the light of this international goal, HEIs have been called to play a critical role in promoting sustainability (Swaim *et al.*, 2014; UNESCO, 2014, 2017; Sekhar and Raina, 2021; Okubo *et al.*, 2021; Amézaga *et al.*, 2021; Goller *et al.*, 2022). Importantly, business schools need to respond to this call given the fact that without sustainable education, it would be difficult to infuse the principles of sustainable development. More specifically, the integration of sustainability in accounting and finance curricula lags behind the development made in other disciplines (Mburayi and Wall, 2018). Analyzing the findings of existing literature, Mburayi and Wall (2018) found that, so far, a narrow aspect of sustainability has been integrated into the curricula of accounting and finance programs; therefore, only a small number of students have been exposed to sustainability in accounting and finance education (legitimacy gap). As we know, the current and future generation students are the potential future leaders; therefore, it is challenging to implement sustainable principles in the workplace without conceptual knowledge of sustainable development in accounting education. This may further affect the expectations of society and organizations from HEIs (legitimacy perspective). Thus, schools of accounting and finance, in different countries, started developing new related accounting and finance courses as part of their response to ESD. Researchers have also responded to this development with great interest by understanding students' perceptions, attitudes and behaviors toward ESD and its determinants.

Attitude of students toward education for sustainability development

Understanding students' perception toward sustainability may help the business schools identify the best way to integrate sustainable development issues into their curriculum. This, in turn, will reflect positively on the effectiveness of these schools in playing an essential role as sustainability-promoting agents. Prior studies used different variables to examine the attitude

of students toward ESD (e.g., Kagawa, 2007; Tang, 2018; Larran *et al.*, 2018; Okubo *et al.*, 2021; Amézaga *et al.*, 2021; Aleixo *et al.*, 2021; Sass *et al.*, 2023). Comparing the results of three different student groups, it was found that students studying sustainability in their minor degree program (second subject beside primary studies) showed a significantly higher acceptance rate than their peers. Aleixo *et al.* (2021) findings revealed that differences exist in the behaviors of Portuguese students toward sustainability in education with respect to genders, age and scientific areas. Wiernik *et al.* (2013) examined the relationship between age and a variety of environmental sustainability-related psychological variables using meta-analytic techniques. He found that older individuals appear to be more likely to engage with nature, avoid environmental harm and conserve raw materials and natural resources. Eugenio *et al.* (2022) claimed that the students' subjective norm and perceived behavioral control affected the Malaysian and Filipino students' willingness to engage in sustainability accounting education. With respect to gender and enrollment in environment-related courses and non-environmental related courses, Tuncer (2008) found a statistically significant mean difference between males and females students' attitudes toward sustainable development. However, no statistically significant mean differences were found between students who enrolled in an environment-related course and those who did not. Das *et al.* (2008), Aleixo *et al.* (2021) found statistically significant mean difference between males and females with respect to their perceptions on sustainable development. In contrast, Hyde (2014) found many similarities with respects to gender. This is followed by Thakkar and Joshi (2017), they found no differences between male and female students attitude toward e-learning. Thus, it is proposed that:

H1. Male and female accounting students' attitudes toward sustainability in accounting education are different.

H2. Differences exist in attitude of accounting students toward sustainability in accounting education with respect to their age group.

Using post-hoc test to determine the differences between seniority of study at university (freshman students, junior, sophomore and senior students) Mahfouz and Ihmeideh (2009) found a statically significant difference between senior and junior level students. They concluded that; "*senior university students have demonstrated high level of interest in using online chat for improving their language proficiency than freshman, sophomore, and junior*" (p. 221). Similarly, Larran *et al.* (2018) found that gender and academic phase (upper level), of Spanish business and accounting students, are the influential factors toward Corporate Social Responsibility (CSR). Therefore, more mature male and female students in the higher levels of undergraduate studies may have positive attitudes toward sustainability in accounting education because attaining an adequate understanding of sustainability in accounting education requires critical thinking, which is more likely to develop at commitment stage Perry (1970) and Belenky *et al.* (1986). To further proceed; we proposed the following hypotheses:

H3. Differences exist in attitude of accounting students toward sustainability in accounting education with respect to their academic classification.

H4. Attitude of accounting students toward sustainably in accounting education with respect to their academic classification (freshman, junior and senior) are different for male and female.

Methodology

Sample

The study uses a quantitative research design for which data was collected at a single point of time from College of Business Administration (COBA) accounting students at Prince

Mohammad Bin Fahd University (PMU). A total of 304 questionnaires were sent by email with 201 responses received. In screening the data, it was found that some students did not provide information on attitude toward sustainability in accounting education. Since students' attitude toward sustainability in accounting education is the key variable of the study, the incomplete responses were not used in the data.

Method

The study analyzed 132 [1] valid responses to examine attitude of students toward sustainability issues in accounting education. The survey was provided with a cover letter that briefly explained its purpose and content, along with a statement covering ethical considerations. The study also received institutional review and approval in terms of ethics and permissions. The survey included two main parts. Part one aims to collect demographic data on the participants (i.e. age, gender, program and undergraduate level, whereas part 2 aims to collect data on students' attitude toward sustainability in accounting education. To measure attitude toward sustainability in accounting education we adapted the scale developed by Sharma and Kelly (2014, p. 146-148). The scale consist of four items, a sample items include; "*how well do you think, you understand the concept of sustainability in accounting education*", "*to what extent do you think your knowledge in sustainability accounting has been improved*", "*how satisfied are you with learning sustainability in accounting education*" and "*learning sustainability in accounting education is useful for my studies*" for more details, see Appendix 2.

Data analysis

The data collected from the questionnaires were analyzed via Statistical Package for Soical Sciences (SPSS), statistical tests such as an independent sample *t*-test, a one-way ANOVA and a two-way ANOVA were performed. 88 (67%) of the respondents were male and 44 (33%) were female. With respect to their age, 36 (27%) of the respondents were under 21, 82 (62%) under the age bracket of 21–25 and 14 (11%) under the age bracket of 26–30. Based on seniority, 41 (31%) were freshman, 33 (25%) were Junior and 58 (44%) of the respondents were senior students.

Findings

To compare accounting students' perception toward sustainability in accounting education for male and female, the study found not that significant difference in the mean scores for male (*M=4.0, SD=0.99*) and female (*M=3.5, SD=1.4*) [t (132)=*−1.92, p=>0.05 two-tailed*], H1 was not supported (see Table 1 for detail).

To investigate the impact of age on students' attitude toward sustainability in accounting education one-way between groups analysis of variance was conducted, students were divided into three categories as per their age (*Group 1: under 21 years; Group 2: 21–35 years, Group 3; 26–30 years*). No differences were found between three age categories (*F=2.51, p value=> 0.05*). Further, a little differences were found between age group 1 and age group 3 exist; however, these differences are significant at 10% level. Under 21-group 1, N=36 (*M=3.6; SD=1.4*), 26–30-group 2, N=14 (*M=4.5; SD 0.85*), see details in Table 2.

To examine accounting students' attitude toward sustainability in accounting education from seniority perspective one-way between groups ANOVA was performed. Students were divided into three categories as per their seniority (*Group 1: senior; Group 2: junior, Group 3; freshman*). The study found a statistical difference between three categories (*F=14.4, p value = < 0.05*). The study further found that the differences between the senior group were significantly different from junior and freshman groups. Senior group 1, N=58 (*M=4.4;*

Gender		N	Mean	SD	Std. Errors means
Students attitude toward SA	Male	88	4.0	0.99	0.10
	Female	44	3.59	1.4	0.22

Students attitude toward SA	Lenene's test F	Sig	T	Df	*t*-test for Equality of Means Sig (two t)	Mean difference	Std. Errors Difference	Lower	Upper
Equal variance not assumed	1.92	62.8	0.058	0.477	0.247	−0.017	0.971		

Table 1.
T-test for equality of means (gender)

Source(s): Authors' own elaboration

(I) AGE	(J) AGE	Mean difference (I–J)	Std. Error	Sig	95% Confidence interval LB	UB
Under 21	21–25	−0.24	0.23	0.54	−0.80	0.31
	26–30	−0.83	0.37	0.06	−1.7	0.04
21–25	Under 21	0.24	0.23	0.54	−0.31	0.80
	26–30	−0.58	0.34	0.20	−1.3	0.22
26–30	Under 21	0.833	0.37	0.06	−0.04	1.7
	21–25	0.58	0.34	0.20	−0.22	1.3

Table 2.
Multiple comparisons (age)

Note(s): *. The mean difference is significant at the 0.05 level
Dependent variable: attitudes toward sustainability in accounting education
Source(s): Authors' own elaboration

SD=0.77), junior group 2, N=33 (*M=3.4; SD 1.0*) and freshman group 3, N=41 (*M=3.4; SD, 1.4*). Based on empirical evidence H3 was supported, and see Table 3 below for details.

To test the impact of seniority and age on students' attitudes toward sustainability in accounting education, it was found that academic classification does affect attitude of students toward sustainability in accounting education *(F=3.2; p = <0.05 and partial eta squared=0.05, a medium effect size* [2]), whereas the direct role of age (*F=1.9; p=>0.05*) on students attitudes toward sustainability in accounting education were insignificant in the same model. Further, the association between academic classification and students' attitudes toward sustainability in accounting education were not influenced by the intervening role of age (*F=1.92; p=0.11 and partial eta squared (PES) = 0.059*).

Seniority	Seniority	Mean difference	Std. Error	Sig	95% Confidence interval Lower Bound	Upper Bound
Senior	Junior	1.05*	0.23	0.000	0.49	1.6
	Freshman	0.99*	0.22	0.000	0.46	1.5
Junior	Senior	−1.05*	0.23	0.000	−1.6	−0.49
	Freshman	−0.06	0.25	0.966	−0.66	0.53
Freshman	Senior	−0.99*	0.22	0.000	−1.5	−0.46
	Junior	0.06	0.25	0.966	−0.53	−0.66

Table 3.
Multiple comparisons (seniority)

Note(s): *. The mean difference is significant at the 0.05 level
Dependent variable: attitudes toward sustainability in accounting education
Source(s): Authors' own elaboration

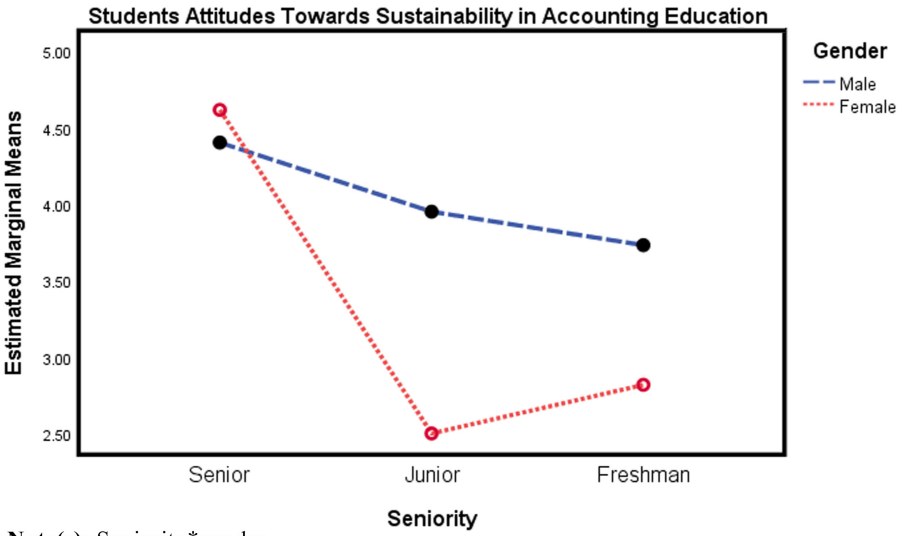
Interestingly, the study found a statistically significant relationship between gender and students' attitudes toward sustainability in accounting education (*F=13.7; p = <0.05; partial eta squared=0.09*) and seniority and students' attitude toward sustainability in accounting education relationship (*F=22.3, p = <0.05, partial eta squared=0.26*). The interactive role of gender on the relationship between seniority and students' attitudes toward sustainability in accounting education was also statistically significant (*F=7.35; p=<.05; partial eta squared=0.10*). See for details Table 4, Figure 1.

As shown in the above figure, differences exist between the attitudes of students toward sustainability in accounting education from an academic classification (seniority) perspective. The average differences in the mean scores for freshman and junior are less than the mean scores of senior accounting students. This signifies the direct effect of seniority

Source	Type III sum of squares	Df	Mean square	F	Sig	Partial eta squared
Corrected model	57.5*	5	11.516	11.22	0.000	0.308
Intercept	1471.1	1	1471.15	1433.3	0.000	0.919
Seniority	45.9	2	22.983	22.39	0.000	0.262
Gender	14.0	1	14.065	13.70	0.000	0.098
Seniority * gender	*15.0*	*2*	*7.549*	*7.355*	*0.001*	*0.105*
Error	129.3	126	1.026			
Total	2204.0	132				
Corrected total	186.9	131				

Note(s): *R Squared=0.308 (Adjusted R Squared=0.281)
Dependent variable: attitudes toward sustainability in accounting education
Italic values shows the results are significant
Source(s): Authors' own elaboration

Table 4.
Tests of between-subjects effects



Note(s): Seniority*gender
Source(s): Authors own elaboration

Figure 1.
Slope analysis

on students' attitudes toward sustainability in accounting education. Similarly, average differences exist for gender variable. However, little differences exist between senior male and female students, but differences in the mean scores for junior and freshman students are different for male and female students. This indicates that male and female senior students' attitude toward sustainability in accounting education is high as compared to male and female freshman and junior students, which supports H4. This finding indicates that students at the highest level of their undergraduate program show a commitment to sustainability in accounting (Intellectual Development perspective).

Discussion

Students are the future leaders, and teaching sustainability in accounting education will better prepare them to implement sustainable practices in the workplace. So far, however, a narrow aspect of sustainability has been integrated into the accounting education curricula, which is unlikely to produce change that promotes sustainable behaviors in workplace. In order to successfully implement the principles of sustainable development in accounting education, a learner-centered curriculum design, in which students' perceptions about their level of understandings of sustainability in accounting education, is important. Therefore, the purpose of this study was to examine students' attitudes toward sustainability in accounting education from their demographic perspectives.

Findings of the study with respect to gender revealed that no significant differences exist between male and female, indicating that attitude of male and female accounting students toward sustainability in accounting education are the same. This finding informs us that sustainable accounting can be taught to both male and female since both perceive sustainability in accounting education the same way. This finding is opposite to that of (e.g., Das *et al.*, 2008; Aleixo *et al.*, 2021). They found statistically significant mean difference between males and females with respect to their perceptions on sustainable development. However, the differences may be due to the phenomenon understudy. Our study specifically focuses on sustainably in accounting education, not on sustainable development, which according to some scholar is complex in nature. Based on meta-analyses, Hyde (2014) found many similarities with respects to gender. Similarly, in measuring attitude of students toward e-learning, no significant differences were found between male and female students (Thakkar and Joshi, 2017, p. 212).

With regard to age, the study found few differences between age group 1 and age group 3. However, the differences were significant at a 10% level; thus, it can be said that students age is not an obstacle in teaching suitability in accounting. This finding is aligned with the previous study Aleixo *et al.* (2021) in that little differences exist in the behaviors of Portuguese students toward suitability in education with respect to age. Similarly, Tuncer (2008) and Sass *et al.* (2023) found that older individuals appear to be more likely to engage with nature, avoid environmental harm and conserve raw materials and natural resources. These findings also aligned with our academic classification variable, where our study found that the attitude of senior students toward sustainability in accounting education was statistically different from junior and freshman students. While testing the direct and intervening effect of seniority and age on students' attitude toward sustainability in accounting education, the study found that seniority does affect attitude of student toward sustainability in accounting education, whereas the intervening role of age between seniority and students' attitudes toward sustainability in accounting education were insignificant. Interesting results were found while testing the intervening role of gender in the relationship between seniority and students' attitudes toward sustainability in accounting education. Differences in the mean scores for junior and freshman students are different for male and female students, this indicates that male and female senior students' attitude toward sustainability in accounting education is high as compare to male and female freshman and junior students. This finding very much aligns with (Mahfouz and

Ihmeideh, 2009). They found statically significant difference between senior and junior-level students. Similarly, Larran *et al.* (2018), in which they found that gender and academic phase (upper level), of Spanish business and accounting students, are the influential factors toward CSR. Our findings also proved the validity of Perry Model of Intellectual Development in the context of Saudi Arabia. It can be argued that developing high-level understanding takes times and lot of practice, thereby students develop viewpoints about sustainability in accounting education at commitment phase. Our findings indicate that COBA senior stage students, regardless of their age and gender, can attain adequate understanding of sustainability in accounting education. Therefore, teaching sustainability in accounting education to senior-level students will likely produce change that will promote sustainable behaviors in workplace.

Conclusion

To successfully implement sustainability practices, organizations need leaders who have sufficient knowledge of sustainable development. Our findings propose that designing learner-centered curricula in which students' perceptions about their level of understandings of sustainability in accounting education can minimize legitimization threats. As learner-centered curricula provides a clear understanding on when to teach sustainability in accounting education during their undergraduate studies, it may produce positive changes. Findings of our study address the aforementioned gap (blind spot). With respect to gender, the study concluded that male and female accounting students' attitude toward sustainability in accounting education is equivalent. Although, minor differences between age categories were found, the results are not that significant. With respect to stage of undergraduate education, the study concluded that students could achieve an adequate understanding of sustainability in accounting education commitment to relativism category of Perry model of intellectual development. Meaning that accounting students are more likely to show commitment to sustainable accounting education when they are at their highest stage of undergraduate education. Thus, teaching sustainability in accounting education to senior students at university, regardless of their age and gender, may bring positive changes in their sustainable learning.

Implications

With regards to implications, our study confirms that demographic characteristics of accounting students can affect their attitude toward sustainability in accounting education. To promote sustainable learning behaviors in HEIs, educators should focus on students' demographic characteristic. Specifically, we found robust evidence that regardless of accounting students age and gender, their level of seniority does matter, and senior-level students appreciate multiple viewpoints as they think critically when solving problems Perry (1970). Thus, HEIs need to embed social, economic and environmental courses in accounting curricula and teach the courses to senior-level students. This will enable them to remain legitimate in the eyes of their stakeholders, including local and global accreditation bodies. With respect to teaching sustainability in accounting education, teachers should answer the problems from multiple dimensions. Thereby students will be encouraged and will frequently move to the commitment stage. Teachers also need to maintain a balance between challenges and support while teaching sustainability-related courses in accounting education. On the other hand, students with conceptual knowledge of sustainable development will enable them to apply sustainability principles in the workplace, which may minimize legitimization threats. Moreover, organizations have adopted a triple bottom line; our findings enable HEIs in providing assurance that they are complying with the organizations' expectations adequately-legitimacy perspective.

Theoretically, findings of the study extended the scope of intellectual development theory and legitimacy theory in that teaching sustainability to senior-level accounting students is

adequately fulfilling implicit expectations of society and organizations. Findings of the study have also implications for achieving UN 2030 sustainability development goals (United Nations, 2015, p. 14).

Limitations and suggestions for future research

Despite current study theoretical and methodological strengths, the study is not without limitations.

The focus of current study was PMU and specifically accounting students, which limits the generalizability of the study. Thus, future studies in the Kingdom of Saudi Arabia, in other universities and different disciplines, are welcomed. The current study examine the direct and indirect effects of demographic variables on students attitude toward sustainability in accounting education, while future research can elaborate more on other relevant latent constructs. Furthermore, this study did not consider control variables that may impact the findings of the current study, this may open avenue for clarification in future research. Besides, we found seniority as a key variable for sustainable learning; however, future studies are encouraged and can help identify how to teach sustainability in accounting education to senior-level students. Demographic factor such as students Grade point average (GPA) may be considered in future.

Notes

1. A sample size of 126 is acceptable for two-way ANOVA as per G*Power analysis (for effect size 0.3, prob 0.05 and Power 0.8 see appendix 1 for detail).
2. Eta squared 0.01=small, 0.06 medium and 0.13 large Cohen's (1988).

References

Abu-Alruz, J., Hailat, S., A-Jaradat, M. and Khasawneh, S. (2018), "Attitudes toward pillars of sustainable development: the case for university science education students in Jordan", *Journal of Teacher Education for Sustainability*, Vol. 20 No. 2, pp. 64-73.

Aleixo, A.M., Leal, S. and Azeiteiro, U.M. (2021), "Higher education students' perceptions of sustainable development in Portugal", *Journal of Cleaner Production*, Vol. 327 December 2021, 129429, doi: 10.1016/j.jclepro.2021.129429.

Alexander, L., Julia, H. and Byun, W.J. (2018), *Issues and Trends in Education for Sustainable Development*, of Education on the Move, UNESCO Publishing Access at Issues and Trends in Education for Sustainable Development - Leicht, Alexander, Heiss, Julia, Won Jung Byun - Google Books, Bangkok, Vol. 2.

Amézaga, T.R.W., Camarena, J.L., Figueroa, R.C. and Realivazquez, K.A.G. (2021), "Measuring sustainable development knowledge, attitudes, and behaviors: evidence from university students in Mexico", *Environment, Development and Sustainability*, Vol. 24 No. 1, pp. 1-24, doi: 10.1007/s10668-021-01467-0.

Barth, M. and Timm, J.M. (2011), "Higher education for sustainable development: students perspectives on an innovative approach to educational change", *Journal of Social Sciences*, Vol. 7 No. 1, pp. 13-23.

Belenky, M.F., Clinchy, B.M., Goldberger, N.R. and Tarule, J.M. (1986), *Women's Ways of Knowing: the Development of Self, Voice and Mind*, Basic Books, New York.

Biasutti, F. and Frate, S. (2017), "A validity and reliability study of the attitudes toward sustainable development scale", *Environmental Education Research*, Vol. 23 No. 2, pp. 214-230, doi: 10.1080/13504622.2016.1146660.

Cohen, J. (1988), *Statistical Power Analysis for the Behavioral Sciences*, 2nd ed., Routledge.

Creel, T. and Paz, V. (2018), "Teaching sustainability in an Accounting classroom", *Discourse and Communication for Sustainable Education*, Vol. 9 No. 1, p. 79ñ85.

Das, N., Sen, M. and Pattanayak, J.K. (2008), "Assessment of students' perception towards developing a course in environmental accounting", *International Journal of Accounting & Information Management*, Vol. 16 No. 2, pp. 122-129, doi: 10.1108/18347640810913799.

Dias, B., Onevetch, R., Santos, J. and Lopes, G. (2022), "Competences for sustainable development goals: the challenge in business administration education", *Journal of Teacher Education for Sustainability*, Vol. 24 No. 1, pp. 73-86, doi: 10.2478/jtes-2022-0006.

Ebaid, I.E.-S. (2021), "Sustainability and accounting education: perspectives of undergraduate accounting students in Saudi Arabia", *Journal of Applied Research in Higher Education*, Vol. 14 No. 4, pp. 1371-1393, doi: 10.1108/JARHE-05-2021-0183.

Eugenio, T., Carreira, P., Miettinen, N. and Lourenço, I.M.E.C. (2022), "Understanding students' future intention to engage in sustainability accounting: the case of Malaysia and the Philippines", *Journal of Accounting in Emerging Economies*, Vol. 12 No. 4, pp. 695-715, doi: 10.1108/JAEE-10-2020-0277.

Goller, A. and Rieckmann, M. (2022), "What do we know about teacher educators' perceptions of education for sustainable development? A systematic literature review", *Journal of Teacher Education for Sustainability*, Vol. 24 No. 1, pp. 19-34, doi: 10.2478/jtes-2022-0003.

Hadi, N.U. (2022), "Specifying the problem of measurement models misspecification in management sciences literature", *Journal of International Cooperation and Development*, Vol. 5 No. 3, p. 91, doi: 10.36941/jicd-2022-0015.

Hyde, J.S. (2014), "Gender similarities and differences", *Annual Review of Psychology*, Vol. 65 Nos 373-98, doi: 10.1146/annurev-psych-010213-115057.

Kagawa, F. (2007), "Dissonance in students' perceptions of sustainable development and sustainability: implications for curriculum change", *International Journal of Sustainability in Higher Education*, Vol. 8 No. 3, pp. 317-338, doi: 10.1108/14676370710817174.

Koskela, T. and Kärkkäinen, S. (2021), "Student teachers' change agency in education for sustainable development", *Journal of Teacher Education for Sustainability*, Vol. 23 No. 1, pp. 84-98, doi: 10.2478/jtes-2021-0007.

Larran, M., Andrades, J. and Herrera, J. (2018), "An examination of attitudes and perceptions of Spanish business and accounting students towards corporate social responsibility and sustainability themes", *Spanish Accounting Review*, Vol. 21 No. 2, pp. 196-205, doi: 10.1016/j.rcsar.2018.02.001.

Mahfouz, S.M. and Ihmeideh, F. (2009), "Attitudes of Jordanian University Students towards using online chat discourse with native speakers of English for improving their language proficiency", *Computer Assisted Language Learning*, Vol. 22 No. 3, pp. 207-227, doi: 10.1080/09588220902920151.

Mburayi, L. and Wall, T. (2018), "Sustainability in the professional accounting and finance curriculum: an exploration", *Higher Education, Skills and Work-Based Learning*, Vol. 8 No. 3, pp. 291-311, doi: 10.1108/HESWBL-03-2018-0036.

Okubo, K., Yu, J., Osanai, S. and Serrona, K.R.B. (2021), "Present issues and efforts to integrate sustainable development goals in a local senior high school in Japan: a case study", *Journal of Urban Management*, Vol. 10 No. 1, pp. 57-68, doi: 10.1016/j.jum.2021.02.002.

Perry, W.G. (1970), *Forms of Intellectual and Ethical Development in the College Years: A Scheme*, Holt, Rinehart and Winston, New York.

Sass, W., De Maeyer, S. and Boeve-de Pauw, J. (2023), "Honing action competence in sustainable development: what happens in classrooms matters?", *Environment, Development and Sustainability*, Vol. 25 No. 4, pp. 3649-3670, doi: 10.1007/s10668-022-02195-9.

Sekhar, C. and Raina, R. (2021), "Towards more sustainable future: assessment of sustainability literacy among the future managers in India", *Environment, Development and Sustainability*, Vol. 23 No. 11, pp. 1-27, doi: 10.1007/s10668-021-01316-0.

Sharma, U. and Kelly, M. (2014), "Students' perceptions of education for sustainable development in the accounting and business curriculum at a business school in New Zealand", *Meditari Accountancy Research*, Vol. 22 No. 2, pp. 130-148, doi: 10.1108/MEDAR-12-2012-0042.

Swaim, J.A., Maloni, M.J., Napshin, S.A. and Henley (2014), "Influences on student intention and behavior toward environmental sustainability", *Journal of Business Ethics*, Vol. 124, pp. 465-484, doi: 10.1007/s10551-013-1883-z.

Tang, K.H.D. (2018), "Correlation between sustainability education and engineering students' attitudes towards sustainability", *International Journal of Sustainability in Higher Education*, Vol. 19 No. 3, pp. 459-472, doi: 10.1108/IJSHE-08-2017-0139.

Thakkar, S. and Joshi, H. (2017), "Students attitude towards E-learning", *International Journal of Advance Engineering and Research Development*, Vol. 4 No. 11, pp. 209-213.

Tuncer, G. (2008), "University students perception on sustainable development: a case study from Turkey", *International Research in Geographical and Environmental Education*, Vol. 17 No. 3, doi: 10.1080/10382040802168297.

UNESCO (2014), *Roadmap for Implementing the Global Action Programme on Education for Sustainable Development*, UNESCO.

UNESCO (2017), "Education for sustainable development goals - learning objectives", available at: https://millenniumedu.org/wp-content/uploads/2017/08/en-unescolearningobjectives

UNESCO (2021), "Berlin declaration on education for sustainable development", available at: https://en.unesco.org/events/ESDfor2030

United Nations (2015), "Transforming our world: the 2030 Agenda for Sustainable Development", 21 October 2015, A/RES/70/1, available at: https://www.refworld.org/docid/57b6e3e44.html (accessed 1 October 2022)

United Nations (2017), "Resolution adopted by the general assembly on 6 july 2017, work of the statistical commission pertaining to the 2030 agenda for sustainable development A/RES/71/313".

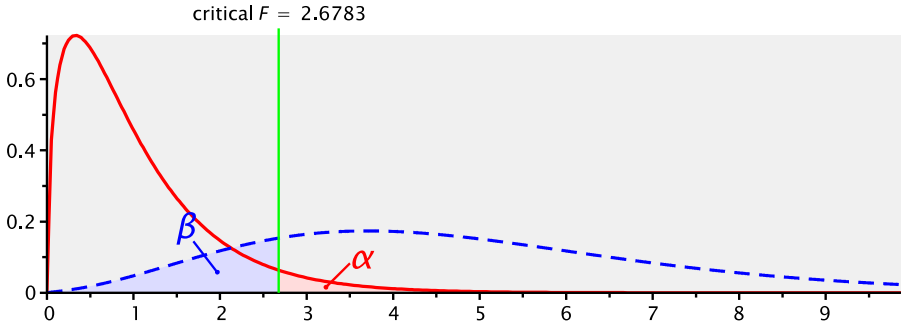
Wiernik, M., Ones, B.S.D. and Dilchert, S. (2013), "Age and environmental sustainability: a meta-analysis", *Journal of Managerial Psychology*, Vol. 28 Nos 7/8, pp. 826-856, doi: 10.1108/JMP-07-2013-0221.

Yuan, X. and Zuo, J. (2013), "A critical assessment of the Higher Education for Sustainable Development from students' perspectives- a Chinese study", *Journal of Cleaner Production*, Vol. 48 June, pp. 108-115, doi: 10.1016/j.jclepro.2012.10.041.

Zeegers, Y. and Francis Clark, I. (2014), "Students' perceptions of education for sustainable development", *International Journal of Sustainability in Higher Education*, Vol. 15 No. 2, pp. 242-253, doi: 10.1108/IJSHE-09-2012-0079.

Appendix 1

*G*Power analysis for sample size*



Source(s): Appendix by author

Appendix 2

Measures of attitude toward sustainability in accounting education

How well do you think you understand the concept of sustainability in accounting education?

Anchored by 1–5 (I do not understand the concept, understand little, understand some, reasonably understand and understand a lot).

To what extent do you think your knowledge in sustainability accounting has been improved?

Anchored by 1–5 (I have become more confused, improve a little, improve some, reasonably improve and improved very much).

How satisfied are you with learning sustainability in accounting education?

Anchored by 1–5 (not at all satisfied, not very, neutral, little satisfied and very satisfied).

Learning sustainability in accounting education is useful for my studies.

Anchored by 1–5 (not at all, not very, neutral, somewhat and very useful).

Note(s): The nature of construct is reflective, as a close relationship exists between, understanding, improvement, satisfaction and usefulness) (for details, see Hadi, 2022).

Corresponding author

Noor Ul Hadi can be contacted at: n_hadi1@yahoo.com