For research article

Response to Reviewer 4 Comments

1. Summary

Thank you for taking time to review the R4 version of the paper titled "The Impact of E-Learning Technologies on Entrepreneurship and Sustainability Performance". This study investigates on the impact of E-Learning technologies (ELT) on entrepreneurial education performance (including personal skills, product skills and business skills), and the sustainability efficacy and their impact on sustainability awareness. Based on the data of 101 master students, the authors adopted PLS analysis and found that ELT have significant relationship with entrepreneurial performances and sustainability 17 efficacy. Meanwhile, sustainability efficacy also has significant relationship with sustainability awareness. However, no significant relationship between entrepreneurial skills and sustainability awareness was identified. In the following paragraphs I present some comments to improve the paper.

2. Questions for General Evaluation	**Reviewer's Evaluation**	**Response and Revisions**
Is the content succinctly described and contextualized with respect to previous and present theoretical background and empirical research (if applicable) on the topic?	Can be improved	
Are all the cited references relevant to the research?	Must be improved	I have adjusted the literature for those who are too old.
Are the research design, questions, hypotheses and methods clearly stated?	Yes	
Are the arguments and	Yes	

discussion of findings coherent, balanced and compelling?		
For empirical research, are the results clearly presented?	Yes	
Is the article adequately referenced?	Can be improved	
Are the conclusions thoroughly supported by the results presented in the article or referenced in secondary literature?	Can be improved	I have improved the content of the discussion section, where I further discussed and explained the conclusions

3. Point-by-point response to Comments and Suggestions for Authors

Comments 1:

All reference numbers should be included in brackets. Many of the references are entirely unnecessary, and some are quite old (a large percentage of references are over 20 years old). It is recommended to select only those that truly contribute to the study.

Response 1:

I have never been aware of the age issue in the references before, thank you very much for your guidance! I have updated the literature in the following paragraphs:

Line 34: [2]. Leonardi, P.. You're going digital-now what? MIT Sloan Management Review. 2020, 61(2), 28-35.

Line 38: [3]. Sobaih, A.; Hasanein, A.; Abu Elnasr A.. Responses to COVID-19 in Higher Education: Social Media Usage for Sustaining Formal Academic Communication in Developing Countries. Sustainability. 2020, 12(16), 6520-.

Line 43:[6]. Fornasari, A.; Conte, M. What kind of teaching in the post-digital era? The challenges of schools and universities after the pandemic: An explorative survey at University of Bari Aldo Moro. Research on Education and Media. 2023, 15(1), 88-94.

Line 44: [7]. Kulikowski, K.; Przytuła, S.; Sułkowski, L.. E-learning? Never again! On the unintended consequences of COVID-19 forced e-learning on academic teacher motivational job characteristics. Higher Education Quarterly. 2022, 76(1), 174-189.

Line 67: [16]. Gidron, B.; Bar, K.; Finger Keren, M.; Gafni, D.; Hodara, Y.; Krasnopolskaya, I.; Mannor, A.. The Impact Tech Startup: Initial Findings on a New, SDG-Focused Organizational Category. Sustainability. 2023, 15(16), 12419.

Line 93: [19]. Matthews, D.. How will technology reshape the university by 2030? Results from THE's university leaders survey. Times Higher Education. Available online: https://www.timeshighereducation.com/features/how-will- technolo-gy-reshape-university-2030 (accessed on 27 September 2018).

Line 96: [20]. Ebner, M.; Schön, S.; Braun, C.; Ebner, M.; Grigoriadis, Y.; Haas, M.; Leitner, P.; Taraghi, B.. COVID-19 Epidemic as E-Learning Boost? Chronological Development and Effects at an Austrian University against the Background of the Concept of "E-Learning Readiness." Future Internet. 2020, 12(6), 94-.

Line 100: [21]. Arkorful, V.; Abaidoo, N.. The role of e-learning, advantages and disadvantages of its adoption in higher education. International Journal of Instructional Technology and Distance Learning. 2015, 12(1), 29-42.

Line 102: [22]. Rodrigues, H.; Almeida, F.; Figueiredo, V.; Lopes, S.. Tracking e-learning through published papers: A systematic review. Computers and Education. 2019, 136, 87-98.

Line 124: [30]. Paço, A,; Ferreira, J,; Raposo,M.. Development of entrepreneurship education programmes for HEI students: The Lean Start-Up Approach. Journal of Entrepreneurship Education. 2016, 19(2): 39-52.

Line 130: [33]. de Vasconcelos, J.; Kimble, C.; Rocha, Á.. A special issue on knowledge and competence management: Developing Enterprise solutions. Information Systems Frontiers. 2016, 18, 1035-1039.

Line 133: [35]. Hirudayaraj, M.; Baker, R.; Baker, F.. Soft skills for entry-level engineers: What employers want. Education Sciences. 2021, 11(10): 641-.

Line 166: [48]. Raymundo, G.; Matheus, C.; de Moraes Hoefel, L.. Awareness of Sustainability Issues: Holistic Housing Sustainable Thinking. Encyclopedia of sustainability in higher education. 2019, 76-83.

Line 203: [63]. Mayer, R.. Using multimedia for e-learning. Journal of Computer Assisted Learning. 2017, 33, 403-423.

Line 398: [125]. Lee, S.. Methods for testing statistical differences between groups in medical research: statistical standard and guideline of Life Cycle Committee. Life Cycle. 2022, 2.

Comments 2:

The literature review (and the first part of the abstract) is filled with commonsense ideas. Is it necessary to have specific sections, such as 2.1.2 or 2.1.4, to address such basic ideas so briefly.

Response 2:

Thank you for pointing this out. I agree with this comment. Therefore, I have removed the subheadings from the Definition and Concepts section (line 90 – line 175). It looks much

cleaner now.

Comments 3:

To justify that 'Research has shown that electronic learning tools may significantly improve students' learning and memory (...),' an old research study is cited that is not openly accessible and whose results appear, a priori, rather limited. It is recommended to include a critical perspective on these aspects, emphasizing the importance of the ethical dimension when addressing entrepreneurship education.

Response 3:

I have rewritten this paragraph and made changes to the references. Thank you for your careful review.

Research has shown that ELT have potential value in improving student learning, as the sensory memory left by images, videos, and other materials is easier to preserve in long-term memory than the memory left by simple language teaching [63]. However, not all ELT have a positive impact on student learning, for excessive transient information may lead to cognitive load exceeding working memory limits [64]. For example, longer animations result in a large span between visual and auditory sensory memory, which greatly increases the recall of text and finally leads to overloading of working memory [65]. (line 201 - line 207)

63. Mayer, R.. Using multimedia for e-learning. Journal of Computer Assisted Learning. 2017, 33, 403-423.
64. Wong, A.; Leahy, W.; Marcus, N.; Sweller, J.. Cognitive load theory, the transient information effect and e-learning. Learning and instruction. 2012, 22(6): 449-457.
65. Rummer, R.; Schweppe, J.; Fürstenberg, A.; Scheiter, K.; Zindler, A.. The perceptual basis of the modality effect in multimedia learning. Journal of Experimental Psychology. Applied. 2011, 17(2), 159–173.

Comments 4:

4. Finally, it is recommended to enhance the discussion by further engaging with the literature referenced at the beginning.

Response 4:

I have rewritten the discussion section. Thank you so much.

5.1. The impact of ELT

This study reveals that ELT do have positive impact on entrepreneurial and sustainability learning performance. This has a very practical implications for entrepreneurial education in the future. The International Labour Organization (ILO) proposes that entrepreneurship

training must be a small class with a maximum of 30 to 50 students [131]. (line 467 – line 470)

The impact on personal and business skills is 0.35 and 0.36, respectively, with a significance level of $p<0.001$, while the impact on product skills is about 0.26, $p<0.05$. That means the impact of ELT on physical and visible things are more limited and weaker. the most likely cause of this phenomenon is the lack of experience. In Hong Kong, group assignments are an important component of higher education, where students form teams to complete assignments. Due to the characteristics of ELT, students can organize group activities without time and location constraints [69, 70, 71], which can effectively exercise personal skills and business skills. However, product skills are difficult to obtain directly from text or language but require practice and experience [132]. E-learning, being primarily digital and remote, may not provide the same level of hands-on engagement. In this course, students only have access to text and image knowledge, without practical experience. (line 467 – line 470)

5.2. The impact on sustainability awareness

However, the three kinds of entrepreneurial skills did not significantly affect sustainability awareness, which contradicts previous hypotheses. Previous research suggests that entrepreneurial skills can enhance students' awareness of sustainable development [85]. Previous studies have suggested that entrepreneurial skills can enhance students' awareness of sustainable development, while the results of this study indicate that the teaching of entrepreneurial courses has not been well linked with sustainability awareness at the learning stage. The education system in Hong Kong places greater emphasis on academic performance and traditional subject learning, so students may focus more on improving their entrepreneurial skills by im-proving their test and homework scores. Therefore, entrepreneurial skills are more related to business and innovation rather than environmental sustainability. In addition, in this course, we do not have sufficient time to collect environmental education resources, which may also be one of the reasons why students cannot effectively link entrepreneurial skills with sustainability. (line 500 – line 513)

Comments 5:

Some minor flaws were noticed in the reference section. The authors should double check the references to be consistent with the latest reference style recommended by the journal.

Response 5:

I do find some formatting errors in the references. Very thank you for your careful review.