



New trends in management New trends in education

Table of Contents

Introduction

3 From the editor *Małgorzata Marchewka*

Feuilletons

5 2025: A Race Odyssey. Leadership in the era of Al *Don Olcott, Jr.*

New trends in education

- 10 ESP students' attitudes towards using digital dictionaries and AI-based tools in language learning *Dragana Božić Lenard, Katarina Šokčević*
- 20 Education policy assessment of countries using an integrated decision-making approach *E. Ertugrul Karsak, Ece Ucar*
- 29 The impact of the organisational commitment of teachers on work engagement: The mediating role of teaching efficacy *Hsin-Yi Lien, Hsieh-Chih Lai*
- 36 Extracurricular student activity and its impact on developing students' job competencies. The case of students working at BEST Gdansk *Paulina Chobot*
- 47 Study pace reveals differences in online learning using R-squared analysis *Michael A. Kolitsky*

New trends in management

- 54 Green Human Resource Management practices and the pro-environmental behaviour of employees in the TFL sector *Alicja Winnicka-Wejs*
- 66 Subjective well-being of sojourners and its determinants: evidence from Mexico *Agnieszka Golińska, Anna Kwiatkowska*
- 76 Managing selected types of costs related to ESG implementation in enterprises *Monika Szczerbak, Paweł Dec*

e-mentor

printed version of the open access academic journal **e-mentor.edu.pl**

Publishers:

SGH Warsaw School of Economics



Foundation for the Promotion and Accreditation of Economic Education

&

ISSN 1731-6758

Editorial office:

SGH Warsaw School of Economics Centre for Open Education al. Niepodległości 162 02-554 Warsaw, Poland tel. +48 22 564 97 23 fax. +48 22 646 61 42 redakcja@e-mentor.edu.pl

Editorial Board

prof. Maria Aluchna prof. Piotr Bołtuć prof. Ilona Buchem prof. Wojciech Dyduch prof. Charles Dziuban prof. Luciano Floridi prof. Andrzej J. Gapinski dr hab. Andrzej Kononowicz dr Ian Kruszewski dr Frank McCluskey prof. Don Olcott, Jr. prof. Ercan Özen dr inż. Marcin Piekarczyk prof. Sandeep Raha prof. Marek Rocki prof. Maria Romanowska prof. Waldemar Rogowski prof. Piotr Wachowiak

Editorial team: Editors: Marcin Dąbrowski, Małgorzata Marchewka

Editorial Assistant and Content Editor: Katarzyna Majewska

Typesetting: Elżbieta Wojnarowska Cover design: Piotr Cuch

Journal website: Maciej Domalewski, Piotr Gęca, Krzysztof Kalamus, Łukasz Tulik

Journal with 40 points awarded by the Ministry of Science and Higher Education (Poland). Scientific articles are peer reviewed.

Print: 700

From the editor

Dear "e-mentor" readers,

I am delighted to present you with the latest collection of diverse papers exploring current trends in management and education.

The issue begins with a contribution from Don Olcott, Jr. on the topic of leadership in the context of Al, whose perspective offers a valuable addition to the ongoing discussion on the impact of Al on our future. The section dedicated to readers interested in new trends in education also includes references to Al, but in the context of tools used in language teaching.

The education-focused section of the publication addresses several key issues, including the impact of students' extracurricular activities on their development of job competencies, the differing study paces observed in online learning environ-



ments, and the influence of teachers' organisational commitment on their work engagement. Finally, the article compares the educational performance of European Union member states based on a range of criteria, including PISA test results, teacher-to-student ratios, learning time and government expenditure on primary education as a proportion of GDP.

Those primarily interested in management will gain insight into green human resource management practices and the pro-environmental behaviour of employees in the TFL sector, as well as learn how to manage selected types of costs related to ESG implementation in enterprises. The relationship between tourism management and the subjective well-being of visitors, as well as the factors that influence this relationship, is also covered, based on evidence from Mexico.

This issue presents a diverse range of topics and authors from a variety of backgrounds. The internationalisation strategy supported by the Ministry of Science and Higher Education (Poland) with granted funds (RCN/SP/0361/2021/1) has resulted in collaboration between "e-mentor" and foreign organisers of scientific conferences. We have also concentrated our efforts on enhancing the quality of published articles, boosting international visibility, increasing transparency of the editorial process, and modernising the website. Please visit www.e-mentor.edu.pl/eng to view the results of our work. As a result of our efforts, we have seen a notable increase in the number of authors and reviewers affiliated with foreign institutions, with the participation of foreign authors growing from 8% in 2021 to 29% in 2024, while the involvement of foreign reviewers increased from 15% to over 20% in the same period.

Following an analysis of the project results, we have decided to publish all articles in English only. Please be advised that from the beginning of 2025, there will be no further calls for manuscripts prepared in Polish. Furthermore, we have decided to redefine the scope of the journal, focusing on higher education in management and economics. Our goal is to make "e-mentor" a peer-reviewed journal that serves as a forum for the presentation and discussion of research and ideas related to teaching and learning in management and economics higher education. We aim to provide a platform for the exchange of knowledge and insights on the use of technology in education, including e-learning, forms and methods of education, the verification of learning effects, and the integration of new trends in management and economics into higher education.

I would also like to extend an invitation to you to collaborate with us in the creation of "e-mentor" by assuming the role of a reviewer or submitting articles for publication. "E-mentor" is an open-access journal, available free of charge both online and in printed form. All scientific papers are subject to peer review, and we offer complimentary proofreading of papers accepted for publication. Each article is assigned a unique Digital Object Identifier (DOI), and the journal is indexed in a number of global databases, including Web of Science ESCI and EBSCO. There is no publishing fee for authors. Further details are available online at http://www.e-mentor. edu.pl/eng/page/8/Info_for_Authors. Should you have any questions concerning publications in "e-mentor", please contact the editorial team at redakcja@e-mentor.edu.pl.

> Małgorzata Marchewka Editor

Appreciating the invaluable role of reviewers in the process of delivering the best quality papers, we wish to acknowledge the contributions of all 206 reviewers who cooperated with "e-mentor" throughout 2024:

Mustafa Serkan Abdusselam, Małgorzata Adamska-Chudzińska, Dominik Antonowicz, Paweł Antonowicz, Alev Ates-Cobanoğlu, Kanupriya Misra Bakhru, Elizabeth Balbachevsky, Jerzy Balicki, Sławomir Banaszak, Aneta Baranowska, Anna Batorczak, Andrzej Bak, Danuta Bak, Henryk Bednarczyk, Agnieszka Bekisz, András Benedek, Jadwiga Berbeka, László Berényi, Sylwia Białas, Aneta Biernikowicz, Kristín Björnsdóttir, Katarzyna Borawska-Kalbarczyk, Leszek Borowiec, Dragana Božic Lenard, Dariusz Brakoniecki, Wayne Brockbank, Jan Brzóska, Urszula Bukowska, Michał Bukowski, Paweł Cabała, Andrzej Chudnicki, Piotr Cymanow, Wojciech Czakon, Gabriela Czapiewska, Wojciech Marcin Czerski, Magdalena Czerwińska, Dorota Czyżewska-Misztal, Barbara Dancygier, Julia Davydova, Emmanuelle Deglaire, Beata Detyna, Michael Dobbins, Ewa Domagała-Zyśk, Sławomir Dorocki, Janina Filek, Rosemary Fisher, Joan Flaherty, Monika Foltyn-Zarychta, Mateusz Folwarski, Renata Gabryelczyk, Zenon Gajdzica, Beata Gałan, Izabella Gałuszka, C Gangalakshmi, Animesh Ghosh, Teresa Giza, Elżbieta Goryńska-Goldmann, Magdalena Gorzelanny-Dziadkowiec, Anna Góral, Simon Grima, Alexis Hanna, Daria Hejwosz-Gromkowska, Katarzyna Hildt-Ciupińska, Mark Hwang, Ilona Iłowiecka-Tańska, Arkadiusz Jabłoński, Marek Jabłoński, Anna Janiga-Ćmiel, Sylwia Jaskuła-Korporowicz, Magdalena Jaworek, Jarosław Jendza, Bartłomiej Kabaja, Bartosz Kalinowski, Sabina Kauf, David Kemme, Marek Kesy, Piotr Kisielewski, Elzbieta Kolasińska, Agnieszka Konieczna, Anna Kosieradzka, Małgorzata Kosiorek, Iwona Kowalska, Mirosław Kowalski, Grażyna Krzyminiewska, Joanna Krzyżak, Sergo Kuruliszwili, Bartłomiej Kurzyk, Przemysław Kusztelak, Wioletta Kwiatkowska, Krzysztof Leja, Regina Lenart-Gansiniec, Agnieszka Lipińska-Grobelny, Agata Lulewicz-Sas, Izabella Maria Łukasik, Wiesław Łukasiński, Justyna Maciąg, Iwona Maciejowska, Jolanta Maj, Kamila Majewska, Elżbieta Marcinkowska, Małgorzata Maternowska, Agata Matuszewska-Kubicz, Tadeusz Miczka, Anna Mijal, Bogusz Mikuła, Renata Miszczuk, Anna Misztal, Alicja Miś, Vladimir Mityushev, Joanna M. Moczydłowska, Debdas Mondal, Danuta Morańska, Anna Murawska, Anish Nair, Monika Namysłowska, Lorenz S. Neuwirth, Agnieszka Niezgoda, Beata Maria Nowak, Katarzyna Nowosad, Don Olcott, Jr., Robert Oliwa, Wojciech Otrebski, Andrzej Pacana, Ilona Pawełoszek, Edyta Pietrzak, Piotr Plichta, Agnieszka Piotrowska-Piatek, Joanna Podgórska-Rykała, Agata Popławska, Marek Proniewski, Beata Przyborowska, Zdzisław Puślecki, Paula Pypłacz, Roxana Rebolledo Font de la Vall, Marzena Remlein, Anita Richert-Kaźmierska, Igor Rižnar, Marek Rocki, Robert Rogowski, Diana Rokita-Poskart, Katarzyna Rostek, Joanna Rudawska, Sergii Rudenko, Barbara Rychta, Katarzyna Sanak-Kosmowska, Łukasz Scheffs, María Jesús Segovia Vargas, Alicia Sekuła, Anuj Sheopuri, Jedrzej Siciński, Łukasz Sienkiewicz, Maksym W. Sitnicki, Agnieszka Skala-Gosk, Małgorzata Skibińska, Piotr Sliż, Melanie Kay Smith, Alicja Smolbik-Jęczmień, Sandra Spataro, Elżbieta Sroka, Magdalena Stawicka, Beata Stepień, Elżbieta Stolarska-Szeląg, Mariusz Strojny, Aleksandra Sus, Marzena Syper-Jędrzejak, Maciej M. Sysło, Bernadeta Szczupał, Marek Szelagowski, László Szerb, Agnieszka Szplit, Włodzimierz Szpringer, Justyna Szumniak-Samolej, Małgorzata Szupica-Pyrzanowska, Joanna Szydło, Emilia Śmiechowska-Petrovskij, Marilena Z. Leana Tascilar, Jorge Tenório Fernando, Dorina Tila, Agnieszka Tomczak, Kvriaki Tsilika, Özlem Tuna, Anna Ujwary-Gil, José Luis Vázquez-Burguete, Grażyna Voss, Maciej Walczak, Monika Walicka, Tomasz Wanat, Tadeusz Waściński, Sławomir Wawak, Anna Wawrzonek, Małgorzata Winiarska-Brodowska, Robert Wojciech Włodarczyk, Mariusz Wojewoda, Krzysztof Woźniak, Paulina Wójcik-Topór, Ewa Wszendybył-Skulska, Barbara Wyrzykowska, Magdalena Zajączkowska, Janusz Zawiła-Niedźwiecki, Marika Ziemba, Anna Zygierewicz, Joanna Żukowska, Agnieszka Żur, Artur Żurawik.

Our reviewers represent 95 different institutions from 21 countries: Poland, Australia, Austria, Brazil, Canada, Chile, Croatia, France, Germany, Greece, Hungary, Iceland, India, Malta, Republic of South Africa, Romania, Slovenia, Spain, Türkiye, Ukraine, and the United States of America.

THANK YOU!



Don Olcott, Jr.

2025: A Race Odyssey. Leadership in the era of Al

The 20th century could be seen as a race between two versions of man-made hell – the jackbooted state totalitarianism of Orwell's *1984*, and the hedonistic ersatz paradise of Huxley's *Brave new world*, where absolutely everything is a consumer good and human beings are engineered to be happy.

Margaret Atwood, 2007

Introduction

It is indeed no secret that many social and literary critics have noted that 1984 (Orwell, 1949) has never truly arrived; whereas conversely, a *Brave new world* (Huxley, 1932) is seen by many as ubiquitous, everywhere around us and in a sense a source of anxiety and angst for the human condition. The good news is that science and social fiction in all their guises are usually an entertaining mix, and often a synthesis, of truth and fiction, prophecy and satire, and the real and imaginary. Perhaps it would be prudent when talking about leadership in the era of AI to refrain from adopting either-or and black-and-white positions, as even between the dystopian extremes of Orwell and Huxley is there a continuum of options, choices and issues.

The acceleration of AI development over the past two years has been a catalyst for exploring whether this major shift will unlock the keys to the kingdom of leadership, and indeed, it does raise many relevant questions. Does AI make average leaders better leaders? Can AI contribute to more effective leadership and organisational performance? Does AI have the capacity to harness professional development and staff training by drawing upon immense meta 'training' data that refines the algorithms of AI? Does AI dehumanise leadership and its human connections? Does AI necessarily guarantee better decision-making? And lastly, perhaps the most challenging one, is how can AI even begin to approximate scenarios and analyses where human experience, context and judgment must decipher the optimum decision matrix at the right time, for the right reasons, and for the right outcomes? Leadership is not for the faint-hearted. Many experts argue that AI is simply a tool, nothing more and nothing less, which is a safe answer for sure. Conversely, some argue that AI can be an indispensable leadership resource that will literally change the dynamics of behaviour and performance. If only it were that easy. Inevitably, there is truth in both these perspectives, and yet I think it is more prudent to conceptualise AI along a continuum – some forms of AI will align well with leadership roles; other forms perhaps not so much. I will try to consider this continuum in my narrative and give the reader a snapshot of opportunities and challenges pertinent for leadership in the era of AI.

Al brings opportunities and challenges for contemporary organisations, while the rapid and exponential expansion of Al has been the catalyst for how we think about the role of leadership. This is true in business, government, social services, medicine, trade and transport, the military, K-12 schools and universities across the globe, with the whole world mesmerised by the Al hype and showing ubiquitous interest. Moreover, the general *zeitgeist* is cautiously optimistic about Al's potential and eventual results, but there are still many concerns amongst the populace about Al And yet, amidst this mass blitz of AI, there seems to be this palpable expectation that it is the game changer of all game changers.

Don Olcott, Jr., HJ & Associates, Romania, D https://orcid.org/0000-0003-4542-9305

1.0

.

5

Shân Wareing (2023b) reminds us that AI is here to stay in universities. Leaders cannot ignore AI, and they should avoid creating fear and panic amongst staff and stakeholders, and not blame staff for not being ready for the AI race. One should ask what this really means? Universities have historically tended to be quite conservative when it comes to innovations. Fears amongst the populace inside and outside the university are common when there are high levels of uncertainty and ambiguity associated with digital technocracy.

Indeed, in some contexts, AI is controversial and divisive, as the events in the Gaza and Ukrainian wars have recently shown. Many university leaders remain silent in the shadows on controversial and divisive social and political issues. Although AI is certainly not a synonym for genocide, it does raise fears among many across the university and beyond. Indeed, the good, bad and ugly of AI will arise as this Race Odyssey picks up speed. Where will it lead to and with what results?

Information is power, power is money, and money is control when it comes to the supertech players. A Race Odyssey is not semantics and this jostling for position is underway to see who will lead AI in contemporary society, who will *control* the massive data sets for AI 'training,' what economic models will drive AI in the marketplace, and what the impact be on geopolitical power alignments, democratic ideals, equality, equity and other social justice dynamics? There are many legitimate challenges and many potential opportunities, and many of these are not black and white, existing in the 'grey zone.' For now, and perhaps for most of us, the verdict on AI is still out. Of course, the axiom of A Race Odyssey may be viewed as a euphemism for 'danger straight ahead' to remind us all that it is a dangerous race if we do not slow down long enough to navigate the multitude of issues associated with AI It is likely that we could, indeed, arrive at a crossroads of reckoning in the future, unable to save us even from ourselves.

A Race Odyssey on the Horizon

David De Cremer's (2020) suggests that the usual suspects – Amazon, Facebook, Apple, Microsoft, Google and so forth control most of the Al data (Knowledge of Wharton Staff, 2020). How do we make Al inclusive and equitable for the masses? Whoever controls the mass data sets controls the 'training,' the descriptive algorithms for data, how the algorithms are written and for whom, for reaching what results, the costs, and ultimately the profits of Al in a global consumer digital market.

The cold hard truth is that AI is a serious race for power, profit and position in the global digital marketplace in 2025. Paradoxically, most of the players in this race aren't clear about what their competitive advantage or market differentiator is for AI, but they are intent on being the last machine standing when the algorithm dust settles. It is too early in the game to know who will win. Will it be Big Brother, Winston Smith, John the Savage, corporate capitalists [Trump AI Enterprises] and populists, the human race, or will we be unable to save us from ourselves as a new Hal 9000++ decides for us?

Perhaps the brave new world was only a prophetic euphemism for our eventual extinction. And who said leadership does not matter? A drastic reminder that sometimes great leadership is tempering, even preventing something from happening rather than creating something new to marvel the masses. Now isn't that a novel use of Orwellian newspeak! Kirk to Enterprise – please beam us up Scotty!

AI – what are we doing here?

De Cremer also argues that the end-users of AI must always be humans. No kidding, if AI itself becomes the end user then game over. Given AI's effectiveness at repetitive, routine tasks, and thinking systematically and consistently, perhaps AI is more suited for hard skills, whereas leadership preserves its soft skill domains such as visioning, social engagement, partnership development and empathy. Indeed, this brings *Maravec's Paradox* to mind – what is easy for humans is difficult for AI, and what is difficult for humans seems rather easy for AI If we use A. I. for the right things, for the right reasons, and for the right outcomes, this seems like a good start for the new yellow brick road to algorithm Oz.

Advocates argue that AI is a game changer for creating more dynamic and visionary leaders, with some commentators even arguing that the mass data sets that AI will manage will undoubtedly produce better decision making, improved judgment, and a new age of leadership. I guess these advocates need reminding that for the past thirty years we have had more information and knowledge at our fingertips than at any time in history, and the quality of leadership 'ain't got any better in general.'

What universities and leaders do is sometimes difficult to make sense. What has become clear is that AI brings opportunities and challenges for governments, organisations, staff and perhaps most importantly the leaders who drive the pulse of decision-making amidst this digital transformation. We will explore some of the vantage points for university leaders.

The purpose of this essay is to present a practical commentary on how AI can potentially support more effective leadership, as well as discussing some of the challenges associated with AI and leadership. As noted earlier, there are numerous grey area issues about AI that cannot be completely separated from the role of leadership, however it is beyond the scope of this brief to cover the entire playing field. This essay is about leadership in the era of AI.

Finally, Professor Real, fully recharged with an extra dose of *soma*, will end this magnanimous expose but telling aspiring and current leaders exactly what a SMART person would do about AI in their organisation. If the reader wants to skip to the end and discard

. . .

the preface journey, then perhaps genuine leadership is not for them. Leadership, if nothing else, is life in the fast lane. Time to buckle up!

A general leadership resource: What does Al bring to the game?

Given the obvious focus of AI systems built around data, algorithms and analyses, the starting point must ask whether these systems can initially be resources for leaders? Shan Wareing (2023a) discusses five key traits for all higher education leaders: passion, curiosity, battle-hardened confidence, team smarts, a simple mindset and fearlessness. The problem with these leadership platitudes is that one can read whatever they wish into their meaning. A simple mindset for deciphering complex data analyses to make organizational survival and dependent decisions sounds daft, and fearlessness is often a synonym for reckless courage and creates more problems than solutions, while there is a fine line between battle-hardened confidence and sporadic arrogance.

Purdy and Williams (2023) note that business leaders are simply stressed out by the volume of decisions, which has increased 10-fold in the last decade. Undoubtedly, poor decision making may have an impact on the financial health and success of the organization. The authors argue that AI can help with tracking, predicting, simulating and serving as co-pilots or sounding boards. They also argue that organisations need to keep AI expertise up to date, ask the right questions, and ensure the experience level of the user is balanced - practical and machine literacy. Poor decision-making is detrimental to organisations far beyond the loss of profits, leading to diminished confidence in leaders, poor morale, and sometimes even a mass exodus of employees. Leadership is a serious business, and consistently poor decision-making negates most of the other attributes we associate with leadership. AI can be most effective if domain-specific and focused. Real-life expertise matters, and the more we know about a given topic the better AI can reduce errors.

Can simulations be enhanced through AI systems? Indeed, a greater data and experiential pool to draw upon allows for better real-life scenarios, which in turn suggests that these could provide valuable insights and baseline approaches to simulations and their use by leaders in organisations. Simulations, no matter how real and data-based, are still simulations. It is enough to ask a fighter pilot, a Formula 1 driver or a footballer taking a final penalty kick in the World Cup with no time left and a 1:1 draw. Simulations, no matter how good, have limitations, because they are created and refined by humans.

Alan Brown (2024) suggests that leaders retain control of visioning, being flexible, empathetic, and monitoring the emotional climate across the organisation. In other words, there are certain human roles that are emotive-based and beyond the capacity of AI to truly interpret and experience them, regardless of the amount of data used for specific algorithms. Training Al systems with mass data (repository) about known situations results in Al learning from its mistakes, with training data refined, but is this intelligence? Did Hal learn from his mistakes on the *Discovery* or did they learn how to better control Discovery and its crew?

Al advocates have also noted than one positive use of Al is in the training and development portfolios of staff. Expanding staff knowledge, training employees, providing models for the ethical and responsible use of Al, and for data analyses.

Bramly (2024) highlights five key ways in which AI is impacting leadership development:

- 1. Personal planning and training plans
- 2. Data-driven insights
- 3. Diversity and inclusion
- 4. Virtual coaching and mentoring
- 5. Continuous learning and adaptation.

Selected challenges for AI: You can't always get what you want

Will AI become your colleague or a Dictator? AI will be challenged by soft human emotion skills – empathy, critical thinking and emotional intelligence. The truth, however, is that some human leaders lack any resemblance of human emotive and empathetic skills. In some other instances, AI problems include issues of potential bias, ethics violations, data-provenance concerns, and accuracy (Schaffner, 2024). Additional issues include AI bias, FUD factors (fear, uncertainty & doubt) and data protection and security concerns.

At Oxford University, three researchers – Sandra Wachter, Chris Russell and Brent Mittelstand (2024) argue that LLMs produce responses that are plausible, helpful and confident but contain factual inaccuracies, misleading references and biased information. Deciphering this sounds much like a lawyer arguing that their client is telling the truth, just not all the truth and hence a distorted and one-sided version of reality.

Human experience, judgment and decision making

Purdy and Williams (2023) raise some pointed questions for businesses investing in such technology, and by extension, university leaders may be prudent to consider these in their decision-making processes. As a decision maker, when do you trust the machine over the human? What are the conditions for effective human-machine collaboration? How do existing human expertise and judgement enter the equation?

Emotive human attributes are poorly matched with AI (empathy, visioning, social interactions, critical thinking, etc). More importantly, and leaders should pay heed, you cannot teach experience, judgement and context, which are the core trifecta of good decision-making. Leaders in all their human guises and disguises, make the calls no one else wants to make. AI cannot build trust, navigate social dynamics and foster future collaborations. These take innovative

7

human skills grounded in sound judgment, experience and knowledge of the context of a given decision matrix.

No amount of data nor machines can produce that unique a blend of experience, context, insight and judgement to make consistently sound decisions. At the same time, we must not discount AI playing a role in supporting these unique human attributes. Perhaps a complementarity of leadership + AI is a viable resource for the future.

Is AI the new decision-making game changer for academic leaders? I previously wrote about the 005 axiom of decision-making and that nearly all problems have 4-5 good solutions. The goal of finding a single, perfect decision is simply not realistic in a complex world, as leaders often need to synthesise these five options into one practical solution and strategy, which also creates an interesting challenge for AI Can AI synthesise all these options, evaluate the decision variables independently and formulate an optimum solution that is an integrated solution from the five options? The answer would in all probability be yes, provided that the specific logarithms and training instructions were part of the mental schemata of the AI systems used; and sufficient data were part of the repository covering all five solution options.

Rasmus Hougaard, Jacqueline Carter and Rob Stembridge (2024) present an interesting vantage point on leadership, suggesting that AI is best suited for research and data analysis and repetitive simple tasks, whereas human leaders are better for individual and team development, as well as strategic thinking and decision making. This reminds us of a line in the film *The Imitation Game*, where Alan Turing states 'only a machine can beat another machine.'

Hougaard, Carter and Stembridge raise a very important question based on their alignment of what AI aligns, and what humans can do. Is AI more aligned with management than leadership? Core qualities of human leadership are compassion, awareness, and wisdom, and these seem more aligned with human qualities than with the rational, repetitive linear type of tasks we tend to associate with AI We should be cautious here, because language can become our nemesis if we are too arbitrary in how we define management and how we define leadership. Assigning management tasks to AI and leadership to people-oriented attributes tends to ignore the overlap between them.

Indeed, these interactive dimensions of AI, human attributes, management and leadership raise many issues beyond this paper. Moreover, we have seen this before in Hersey and Blanchard's (1977) situational leadership theory, where task versus people orientation are the two primary dimensions. However, this theory also requires an assessment of the maturity level of whom the leader is interacting with in determining whether they are more task-oriented or more people-oriented. This was mentioned by Purdy and Williams earlier in this paper as the experience curve that is an important factor in AI Finally, and which is of significance, situational leadership does not mean the leader has a laundry list of solutions in their coat pocket that they can align to any potentiality at any given time.

Successful leadership, and consequently thriving organisations, have leaders whose followers and employees know who the leader is as a person, what they value and believe, and how they generally approach any leadership issue and processes they use. Employees of organisations do not want leaders who change on every whim to solve leadership issues and make decisions, and, in reality, would probably prefer a machine to make their decisions than to have a human who essentially fails to display the essential human emotions and attributes of being human. AI can and should never replace this leadership formula.

University leaders: An action agenda for AI

We have covered a range of issues and highlighted only select vantage points of AI and leadership in this paper. Now it's time to decipher what we covered and offer some insights for university leaders to consider. Perhaps if we are lucky, we might move one step closer to the brave new world we have long awaited – well at least in the university.

- 1. What is the strategic vision for your university/school/department/company and AI? Do you know what actual AI capacity is running in your organisation tonight? Inventory your full digital capacity, establish a task force for *Discovery* (the name of the spacecraft in 2001) to fully assess whether AI is the right choice for your institution, your staff, your institutional values and culture. Can AI provide staff training plans, professional development, and identify areas for improvement in individual portfolios?
- 2. Engage with your staff, faculty and colleagues across the campus. The FUD factor – fear, uncertainty and doubt – may not be real for you or your leadership team, but it is to your followers. Open the dialogue on your campus. The most serious debacle of this entire AI movement is the assumption that AI is the best option available for humanity.
- 3. Who are your stakeholders for AI? Duplication of the same things is probably one of the greatest wastes of resources ever perpetuated by the social organisation we fondly call the modern university. Is every university going to embrace this alone, just like they have on most truly game-changing innovation since $E = mc^2$? Can AI be a catalyst for collaboration? Yes, I think it must.
- 4. When is Al too much Al? What is your ethical mandate for Al on your campus? The new normal of advocacy of Al and articles/best practices for Al seems to preface everything with the mantra that we will examine the ethical implications of Al and then go full-speed ahead and curse the icebergs. My best guesstimate is that

in the last year, at least 80% of major scholarly journals have had a special issue around AI, with every one of them in small fine print stating 'ethical implications of AI have been evaluated within reason.'

5. What are the costs and benefits of Al for your campus? Costs come in many guises, and many of them are not financial. What are the costs of diminishing staff morale, and for the sake of efficiencies when do people start to feel undervalued and more expendable than machines? The pandemic, according to most data analyses, increased the digital divide and the gap between the haves and the have-nots. Is AI access, quality, equity and cost the same for all?

Summary

Indeed, the most promising strategy here is to create a balance between AI and our human capacity. If university leaders take the necessary time to plan, assess and pilot various options of AI in concert with valued human attributes, then institutional leaders can find the right balance for the right reasons with the right people and the right outcomes that serve society, students, the community and humanity. Decisionmaking can be enhanced and the university a become a better place to live, work, explore and discover.

Transparency is mandatory on university campuses to engage students, staff, faculty, administrators, alumni and all external stakeholders in the issues and decisions pertaining to using AI in ways that leverage the university's capacity to serve all its stakeholders. The rhetoric about ethical considerations needs to be grounded in practical applications of AI, rather than crying wolf because others are crying wolf. AI will probably create some divisive and controversial issues that will have to be dealt with as they emerge., and silence in the shadows or running for cover are not leadership options for a university's leadership, as they are neither leadership nor courageous.

In the final analysis, leadership in the era of AI is not that different from leadership at any other time. University leaders get paid to lead and create a vibrant, innovative, responsive, and thriving organisation. Leaders have one key performance indicator and only one: To create a thriving, successful organisation.

.

Leaders are not hired to be liked or to make friends. As Steve Jobs said, if you want to be liked, 'sell ice cream.' If you want to be a leader, then lead.

References

Atwood, M. (2007). *Introduction*. In A. Huxley, *Brave new world* (inside cover). Vintage.

Bramly, F. (2024, March 22). 5 ways Al is impacting leadership development. Acacia Learning. https://acacialearning. com/blog/management-and-leadership/5-ways-ai-is-impacting-leadership-development/

Brown, A. (2024, April 18). *The impact of AI on the past, present, and future of leadership – part 1*. The Oxford Group. https://www.oxford-group.com/insights/the-impact-of-ai-on-leadership/

De Cremer, D. (2020). *Leadership by algorithm. Who leads and who follows in the AI Era?* Harriman House.

Hersey, P., & Blanchard, K. H. (1977). *Situational leadership*. Center for Leadership Studies.

Hougaard, R., Carter, J., & Stembridge, R. (2024, January 12). The best leaders can't be replaced by Al. *Harvard Business Review*. https://hbr.org/2024/01/the-best-leaders-cant-be-replaced-by-ai

Huxley, A. (1932). Brave new world. Chatto & Windus.

Knowledge of Wharton Staff. (2020, November 2). Artificial intelligence will change change how we think about leadership. *Knowledge at Wharton*. https://knowledge.wharton.upenn.edu/article/artificial-intelligencewill-change-think-leadership/

Orwell, G. (1949). *Nineteen eighty-four*. Secker and Warburg.

Purdy, M. & Williams, M. (2023, October 26). How Al can help leaders make better decisions under pressure. *Harvard Business Review*. https://hbr.org/2023/10/how-ai-can-help-leaders-make-better-decisions-under-pressure

Schaffner, R. (2024, October 26). AI and leadership: How artificial intelligence is changing the leadership role. *Triangility*. https://triangility.com/ai-and-leadership-howartificial-intelligence-is-changing-the-leadership-role/

Wachter, S., Mittelstadt, B., & Russell, C. (2024, August 7). Do large language models have a legal duty to tell the truth? *Royal Society Open Science, 11*, 240197. https://doi. org/10.1098/rsos.240197

Wareing, S. (2023a, October 18). Five traits for higher education leadership – whatever you job title. *Wonkhe*. https://wonkhe.com/blogs/five-traits-for-higher-educa-tion-leadership-whatever-your-job-title

Wareing, S. (2023b, December 14). Stepping up to the leadership challenge of AI. *Wonkhe*. https://wonkhe.com/ blogs/stepping-up-to-the-leadership-challenge-of-ai/

Dr. Don Olcott, Jr., FRSA, is President of HJ & Associates, specialising in global open and distance learning based in Romania and a Consultant Associate with Universal Learning Systems (ULS) in Barcelona, Spain. He holds the academic rank of Professor Extraordinarius of Leadership and ODL at the University of South Africa and adjunct instructor with Oldenburg University, Germany. Don is a Senior Fellow of the European Distance and eLearning Network (EDEN). He is former President and Chairman of the Board of the United States Distance Learning Association (USDLA) and served on the USDLA Board from 2001-2016. He was recipient of the 2024 USDLA Leadership award in higher education and the 2023 recipient of the International Council of Open and Distance Education (ICDE) Prize of Excellence for Lifetime Contributions to the field. He was also the 2013 recipient of the ICDE Individual Prize of Excellence for leadership and service to global ODL. Don was inducted into the International Adult and Continuing Education Hall of Fame in November 2024 in Florence, Italy.

9



Dragana Božić Lenard



Katarina Šokčević

ESP students' attitudes towards using digital dictionaries and AI-based tools in language learning

.

Abstract

The importance of dictionaries in learning a foreign language is indisputable, and the emergence of digital dictionaries and artificial intelligence (AI) has noticeably influenced the way students learn a foreign language, providing fertile ground for implementing AI in education (AIEd). This paper aims to examine the attitudes and experiences of English for Specific Purposes students in the use of digital dictionaries and AI-based tools. The students were anonymously surveyed during the winter semester of the 2023/2024 academic year on the types and frequency, reasons for using digital dictionaries, advantages and disadvantages of using digital dictionaries, as well as potential suggestions for improving digital dictionaries. They also provided their opinion on and experience in using AI tools in learning a foreign language and translations. The findings suggest that the students prefer using bilingual digital dictionaries for checking the meaning of unknown words, and they heavily rely on Google Translate as the most convenient option. The students recognise the potential of AIEd, although they believe AI tools should only be used as supplementary material in language learning. On the other hand, Al-based translation tools can be used as primary translation tools. The study sheds light on the characteristic behaviour of ESP students regarding their digital dictionaries and AI-based tools used for language learning and translating. It points to the need of developing students' digital competence in the realm of digital dictionary use, as well as encourage them to embrace the technology's full potential.

Keywords: ESP students, attitudes, experience, digital dictionaries, AI-based tools

Introduction

The application of information technology in language teaching and learning has recently attracted considerable attention from language researchers (Lei et al., 2022, Shadiev et al., 2023; Shadiev & Young, 2020). Integrating technology in language classes can boost students' motivation, providing a personalised and interactive learning environment. Language educators have numerous digital tools at their disposal, so they need to make an educated choice and use the ones they feel most competent in.

Dictionaries have always been an indispensable means of acquiring new words and learning a foreign language. The digitalisation of education has created the requirements for transforming paper into digital dictionaries, which are superior due to their convenience, interactivity and quick update potential. The emergence of technology and digital tools have been reshaping foreign language teaching views, with foreign language teachers having to address the usage of digital resources and think of ways to incorporate them in classes. The advent of digitalisation fundamentally changed education, and with artificial intelligence (AI) continually penetrating all domains, teachers have to quickly embrace the dramatic growth of AI in education (AIEd) (Hwang et al., 2020). AI-based adaptive learning platforms enable students to customise learning to their needs and preferences, and AI-powered applications provide students with realtime feedback on their grammar, style, structure and overall quality. Recent studies (Bonaccorsi, 2023; Chaudhry & Kazim, 2022; Rodway & Schepman, 2023) have proven the benefits of using digital tools and AIEd, so their integration in classes is inevitable.

Dragana Božić Lenard, University of Osijek, Croatia, D https://orcid.org/0000-0003-4479-1329 Katarina Šokčević, University of Osijek, Croatia, D https://orcid.org/0009-0003-8404-5694

.

. . . .

Both teachers and students should quickly embrace this fact and start adapting to new forms of teaching and learning.

Despite the benefits of digital dictionaries and digital tools, prior research has not sufficiently delved into students' opinions of and experience in using them for language learning. Moreover, previous studies have not comprehensively examined the opinion of university students who major in computer science/engineering and will eventually be working in a field responsible for digitalisation, so this study will constitute a valuable contribution to the current body of literature. In addition to the narrow research scope, this research will study several digital dictionaries and AI tool-related issues, thus potentially paving the way for conducting future research in multiple directions.

Theoretical background

Dictionary users can be divided into professional, non-professional and language learners, and the variables of native/second/foreign/special purposes language and language proficiency have been reported to affect dictionary usage. The study by Tahriri and Ariyan (2015) confirms some dated findings that monolingual dictionaries are a better choice for those more advanced, while bilingual dictionaries are a wiser choice for less experienced users. In comparison, language teachers encourage students to use monolingual dictionaries from the very beginning of language learning (Holi Ali, 2012). Recent studies on dictionary usage by English for Specific Purposes students (Glušac & Milić, 2020; Knežević et al., 2019) show that students prefer using bilingual dictionaries due to frequent translation tasks from their native language to English, and vice versa. ESP teachers, on the other hand, encourage monolingual dictionary usage, since they perceive them as higher quality resources than bilingual ones.

In a study by Wuttikrikunlaya and associates (2018), involving university students learning English, it was found that the first choice of students when doing written assignments are online bilingual dictionaries. The most popular is Google Translate (Bahri & Masadi, 2016; Bin Dahmash, 2020; Chompurach, 2021; Gumartifa et al., 2022; Tsai, 2022), even though students have mixed feelings about its accuracy, and some even reported to have felt like failures for using it (Cornel et al., 2016). Dictionaries are usually used for receptive (reading) or productive (writing/translating or less frequently speaking) purposes, even though they can be used for acquiring new vocabulary. Recent studies by Selcuk and Daniela (2022) and Waloyo et al. (2021) found that more experienced students use dictionaries for productivity, whereas novice students use them for receptive skills and vocabulary acquisition.

Artificial intelligence is a part of digital evolution involving Computer Assisted Language Learning (CALL) and its varieties. Language teachers frequently create an Intelligent Virtual Environment (IVE) and utilise different digital tools, which have proven to be very efficient in language teaching and learning (Hwang et al, 2022; Silvestru et al., 2022). Studies report multiple benefits of IVE, such as enhancing vocabulary acquisition (Lai & Chen, 2021; Tai et al., 2020), students' willingness to communicate in English (Ebadi & Ebadijalal, 2020), and boosting motivation for language learning (Chen et al., 2020; York et al., 2021) due to reducing anxiety and peer pressure. Digital learning systems or Intelligent Tutoring Systems (ITSs) are designed to facilitate needs-based tutoring, and can help students, through self-regulated learning based on one's performance, to improve speaking (Mohammadzadeh & Sarkhosh, 2018), grammar (Jiang, 2022) or reading skills (Xu et al., 2019).

Al chatbots replicate human interaction in a written or spoken form, continuously updating their internal database. There is an ever-increasing body of literature reporting positive effects of using chatbots, and Kim and associates (2021) reported an improvement in students' intonation, stress and fluency. Chatbots increased students' motivation and made language classes more interesting and fun, as concluded by Belda-Medina and Calvo-Ferrer (2022), Hew et al. (2023), Mahmoud (2022) and Nghi et al. (2019). However, there are studies (Çakmak, 2022; Yin & Satar, 2020) that reported on negative students' attitudes toward using chatbots and increasing anxiety levels when speaking in foreign language classes.

This brief review of recent research into digital dictionary usage in language teaching and learning as well as the use of AI in various teaching and learning segments shows that the field is still underresearched. Contradictory findings point to room for conducting further research.

Methodology

The paper aims to examine the students' opinions of and experience in using digital dictionaries and artificial intelligence tools. For collecting quantitative data, a questionnaire survey was designed in Google Forms. It consisted of 25 questions ranging from yes/ no and multiple-choice to five-point rating scales and open-ended questions. The survey was divided in three parts – demographic information (the participants' gender, study year and the number of years studying English), experience in using digital dictionaries and opinion of/experience in using AI tools. The second part dealt with the issues of the types and frequency of digital dictionary usage, reasons for using digital dictionaries, advantages and disadvantages of using digital dictionaries as well as potential suggestions for improving digital dictionaries. The final questionnaire part covered the participants' opinions on using artificial intelligence tools in learning a foreign language, their personal experience in using such tools as well as their prediction on the effect AI tools might have on learning a foreign language and translation.

The questionnaire was administered in the winter semester of the academic year 2023/2024 and was

sent via e-mail to the Computer Engineering students studying at the Faculty of Electrical Engineering, Computer Science and Information Technology Osijek where the authors teach and/or study. Participation in the survey was anonymous and voluntary following the participants' verbal consent. 256 students (73%) participated in the survey, which is the weak point of this research since we cannot make generalisations based on the survey results. The data were analyzed using the software package SPSS Statistics 22.

Participants

Our method of recruiting students is a convenience sample. Even though the sample is not representative in a statistical sense, it is representative of the diversity in the underlying student population in terms of gender at the institution where the research was conducted. 71% of the male and 29% of the female students voluntarily participated in the survey, thus representing the population of Computer Engineering students studying at the aforementioned higher education institution. As shown in Figure 1, the participants study at all five levels (three first and two second-cycle degree levels) speaking in favour of the participants' diversity. However, the majority of the participants study in the third year of the undergraduate level, where one of the authors teaches and can easily (re)encourage them to participate, hence the reason for such participants' distribution.

The majority of the participants study English for 11 to 15 or more than 15 years (32.3% and 62.9%, respectively), so they are quite experienced foreign language users who are at the intermediate and upper-intermediate level.

Instrument

The survey was created in Google Docs due to easier distribution and data processing. The survey results were uploaded in the software for statistical analysis SPSS where the normality and homogeneity tests were conducted to fulfill the statistical assumptions. Kolmogorov-Smirnov and Levene's test pointed to an uneven data distribution, which resulted in using the non-parametric and descriptive statistics tests. The open-ended comments were analysed using a recursive reading of all comments.

Figure 2

Dictionary types

Figure 1

Participants' study levels



Source: authors' own work.

Research questions

The study was conducted with the aim to tackle the following research questions:

- 1. Which digital dictionaries do ESP students use?
- 2. What are the reasons for using digital dictionaries?
- 3. What are the advantages and disadvantages of using digital dictionaries?
- 4. How will AI affect language learning and translation?
- 5. Are there any differences in the attitudes of the participants based on their gender or language proficiency?

Results and discussion

The results are presented in two subsections, namely digital dictionaries and Al tools. Each section contains our statistical analysis results and related empirical research tackling specific issues because we find this paper structuring more efficient.

Digital dictionaries

The participants use the dictionary types as presented in Figure 2.

The results show that picture, idiom and collocation dictionaries are not very frequently used. Since the participants are university students who are not English language majors, this result does not come as a surprise and is in line with Alhatmi's (2019) findings.



A low percentage is recorded in the use of specialised mono/bilingual dictionaries, which is surprising given the fact that the participants study computer engineering and presumably need a specialised dictionary for their studies. Our results corroborate the findings of Knežević et al. (2021) conducted at 11 Serbian faculties. The authors found that the reasons for students' not using specialised dictionaries lies in them not being informed about the dictionaries' availability.

According to the data presented in Figure 3, it is clear that the participants prefer the most known dictionaries (Oxford, Cambridge and Dictionary). Similar to Pikilnyak et al.'s (2021), Niitemaa and Pietilä's (2018) and Tight's (2017) findings, our research has shown that the participants' most frequent digital dictionary choice is Google Translate probably because of its convenience and accessibility.

The participants were asked about the situations they use digital dictionaries in. Only 26.6% of the participants always use digital dictionaries when they read in a foreign language. This might mean that either the participants do not read challenging texts in English or their English is at a level they can grasp the meaning based on contextual information. The group who most frequently consult digital dictionaries when reading are the third-year undergraduate students (31.5%) who are obliged to do a final paper at the end of their third year, which might explain their willingness to read more in the English language and consequently use digital dictionaries. The students rarely (32.3%) or never

(18.5%) use digital dictionaries when communicating in English. This is rather expected because pausing a conversation to check up a word would be unconventional and unnatural. In comparison, the students very frequently (38.7%) or always (8.9%) use digital dictionaries when writing in the English language. Even though it is not statistically significant (p = 0.865), 60% of the students who are studying English between 6 and 10 years always use digital dictionaries when writing in English, which is expected since they are more insecure than their more experienced colleagues. When travelling abroad, only 10.5% of the students always use digital dictionaries, which might be due to the lack of the internet connection. 40% of those students are the least linguistically experienced ones, which is expected. Mann-Whitney test has pointed to a gender difference, i.e. the female students, who do not belong to the group of the least experienced language users, use digital dictionaries when abroad significantly more (Z = -2.356, p = 0.018) than the male students. This can be explained with the phenomenon of hypercorrectness attributed to women. It was first recorded in the 1970s and confirmed in many fields and studies ever since the most recent of which are Mugadas and Nawaz's (2022), Shafira's (2022) and Božić Lenard's (2023). The studies show that, regardless of the context, women are still hypercorrect in their usage of both grammar and vocabulary.

The data presented in Figure 4 list the reasons/activities the participants use digital dictionaries for.

Figure 3

Used dictionaries



e-mentor nr 5 (107) 13

As seen from the figure, the participants most frequently check the meaning of unfamiliar words probably when translating them to and from their native language. They are also interested in spelling as well as synonyms and pronunciation to a lesser extent. The least frequent usage involves the difference between the English language varieties (American vs British English), antonyms, contextual use and grammatical information about the words. The study done by Li and Dao (2019) involving Vietnamese students showed that they use digital dictionaries for the aforesaid activities more than the participants from our study. Our results suggest that the participants consult dictionaries for activities related to writing and speaking in the English language, i.e. the productive skills, which corroborates Knežević et al. (2021) findings. The Croatian students being similar to the Serbian ones and different from the Vietnamese in their usage of digital dictionaries might point to a cultural difference, which could be worth exploring.

As for the three main advantages of using digital dictionaries, the participants listed availability (79.8%), price (77.4%) and saving time (70.2%). Interestingly, only 14.5% of the participants opted for the reliability as one of the main three advantages of digital dictionaries. To compare, they listed the distracting nature of advertisements (62.1%), internet connection (58.9%) and limited free versions (41.1%) as the three main disadvantages, thus being in agreement with Tanjung and Daulay's (2023) and Le and Dao's (2019) research. The participants suggested designing offline dictionaries, blocking advertisements, improving free versions and providing more contextual examples.

Artificial intelligence tools

The survey responses provide insights into the participants' opinions on the effect AI tools will have on different aspects of foreign language learning, using AI tools as a primary tool for foreign language learning and translating and the use of AI chatbots among university students.

The participants' replies regarding their prediction of negative effects AI tools will have on foreign language learning are evenly distributed – a third of the participants do not believe AI tools will have negative effects on foreign language learning, a third is uncertain and a third believes the effects will be negative. However, their responses on more specific issues related to language learning are not so evenly distributed. 31.5% of the participants believe that AI tools will have no and 41.9% think it will have a slight positive impact on pronunciation. In the most recent studies by Karlina et al. (2020), Kazu and Kuvvetli (2023) and Lee (2021) it was proven that AI tools for pronunciation instruction considerably boosted the students' word memory capacities. Also, Dillon and Wells (2021) and Spring and Tabuchi (2021) recorded the enthusiastic behaviour of students in using AI pronunciation-related tools and consequently their opinion on the positive impacts such tools would have. Our results contradict the aforementioned,

which might be explained with the lack of experience our participants have in using AI pronunciationrelated tools. Also, the moderate usage of digital dictionaries for checking pronunciation, listed in Figure 4, and not listing it as one of the main advantages of using digital dictionaries suggest that our participants do not consider pronunciation as important enough to work on it and/or use AI pronunciation-related tools.

The majority of the participants (45.7%) believe the use of AI tools will not affect their mistake making. Conducting Mann-Whitney test, we recorded a gender difference, i.e. the female students believe that using AI tools will eventually result in them making more language mistakes unlike the male students (Z = -2.149, p = 0.032). This finding is in agreement with our result on the female students feeling the pressure to being more correct than their male counterparts. A considerably high percentage of the participants (75.8%) think that AI tools will positively affect the foreign language learning process, which supports the recent research by Huang et al. (2023), Pedro et al. (2019) and Pikhart (2020) that proved a positive correlation of using AI tools and enhancing students' learning achievements.

To compare, 42% of the participants feel that the use of AI tools will negatively affect their interaction with other people. Despite not being statistically significant (p = 0.481), the female students are more pessimistic than the male ones (47.2% and 39.8%, respectively). A Spearman's rank-order correlation was run to determine the relationship between the students' opinion on the effect AI tools may have on pronunciation and interaction with other people. There was a strong, positive gender-related correlation between these scores, which was statistically significant (r(36) = 0.336, p = 0.045). It means that those female students who believe AI tools will affect pronunciation learning also believe it will negatively affect the interaction with others while such correlation was not recorded for the male students (r(88) = 0.221, p = 0.410). A similar reasoning was recorded with the students who have been studying English for more than 15 years (r(40) = 0.412), p = 0.008). They have probably been taught the English language with both traditional and experimental methods and could be seeing a negative effect the latter has on their communication in general. Some recent studies (Hohenstein et al., 2023, Wilkens, 2020) reported the disadvantages, such as the lack of personalisation and human touch, as well as the potential for a communication gap in using AI tools in corporations.

Critical thinking is crucial for making educated decisions in both academic and real-world situations. The said skills are of the utmost importance for computer engineers whose everyday activities rely upon them. The evolution of AI has added a new dimension because AI has the potential to revolutionise educational settings by personalizing learning experiences and providing real-time assessments

(Alam, 2022; Kamalov et al., 2023), thus affecting critical thinking. 65.6% of the participants from our study believe that AI tools will negatively affect their critical thinking skills. A Spearman's rank-order correlation revealed a strong positive significant correlation (r(124) = 0.459, p = 0.000), i.e. those students who believe AI tools will negatively affect their interaction with other people also believe the same will happen with their critical thinking skills. Despite studying in the field responsible for developing and maintaining AI, the participants are very careful and pessimistic about their future and AI's impact, which contradicts the findings by Darwin et al. (2024) and Muthmainnah et al. (2022) whose participants believe that AI will enhance students' critical thinking abilities.

.

There is a strong consensus that creativity is a core 21st century skill. There have been many attempts to combine creativity and AI in a computational creativity. Contemporary education favors problem-solving pedagogies fostering students to think creatively. Emerging research (Belpaeme et al., 2018; Marrone et al., 2022; Wang et al., 2023) prove that AI can foster creativity if students have a positive attitude towards it. Other studies (Habib et al., 2024) report on the negative effects AI can have on students' creativity. 66.2% of the students from our study believe that AI tools will negatively affect creativity skills. A strong positive correlation was recorded with a Spearman correlation test. Those students who think AI tools will negatively affect creativity share the same opinion for its effect on the interaction (r(124) = 0.383), p = 0.000) and critical thinking skills (r(124) = 0.634, p = 0.000), thus being in accordance with Habib et al.'s (2024) and Marrone et al.'s (2022) results. Before integrating AI into education, misconceptions students may have on it must be resolved, so that they can embrace the technology and use the most of it to improve their skills.

Integrating computers in language learning (CALL) has been around for some time. The most recent research (Abbasi, 2022; Alian et al., 2018; Algahtani Mofareh, 2019; Andujar, 2019) found that students' motivation for learning a foreign language is greatly enhanced by CALL because classes are more interesting and interactive. However, the previous studies investigated CALL as a supplementary material; not the primary one. Only 29.9% of the participants from our study believe that computer-assisted language learning materials like Duolingo and Babbel will be primarily used for learning a foreign language, i.e. they agree that CALL will be used but not predominately, which supports the aforementioned studies. To contrast, 66.9% of them think that the AI-powered machine translation tools, such as Google Translate, DeepL, etc., will be used as a primary translation tool. There is a positive correlation (r(124) = 0.597, p = 0.038)between the students' opinion on predominantly using machine translation tools in future and their using digital dictionaries on a daily basis right now. The proliferation of machine translation impressively

accurate tools creates both opportunities and challenges for language learners who do not mind using them as proven by ours and Kushmar et al.'s (2022), Kong's (2022) and Raheem's (2020) studies. It seems possible that the students prefer and are not ready to marginalise the human approach when studying, which is not necessary when translating.

Subtitles are considered as a primary learning tool for those who cannot understand narration in a foreign language. Recent advancements in AI have played a pivotal role in automatic video subtitling on platforms like YouTube. In spite of its popularity, 58.8% of our participants do not rate automatic subtitles as of very good quality. On the other hand, online grammar checker tools like Grammarly are rated as very beneficial and of very good quality, which is in accordance with Fitriana and Nurazni's (2022), Fitria et al. (2022), O'Neill and Russell's (2019), and Karyuatry's (2018) research.

One of the emerging AI tools is undoubtedly an interactive conversational programme Chatbot. Numerous recent research has examined its effectiveness on different language skills acquisition. Kim (2020) concluded that a chatbot provides an authentic experience and simulates human communication. Belda-Medina and Calvo-Ferrer (2022), Bibauw et al. (2022), Fryer et al. (2022), Klimova and Seraj (2023), and Mohamed and Alian (2023), are only some of the recent research, which confirmed chatbots as valuable resources in EFL learning. The findings suggest that chatbots boost students' enthusiasm and confidence, i.e. students feel competent enough to be autonomous learners who prefer communicating with a chatbot rather than a real person. Half of the students from our study (57.6%) do not choose a chatbot over a person for communication, which is contrary to the aforementioned studies. A Kruskal-Wallis H test showed that there was a statistically significant difference in using chatbots between the students based on the length of their language learning $\chi^2(3) = 9.077$, p = 0.028, i.e. the students with the least experience (up to five years) feel more comfortable talking to a chatbot than more experienced students. This is probably related to the fear of public speaking and peer pressure the least experienced students may feel when speaking in the class while no such pressure is present when speaking to a chatbot. Our interpretation is supported by the Spearman correlation test results, which showed a statistically significant correlation between the use of chatbots and an opinion, expressed by the least experienced students, that the use of AI will reduce the fear of making mistakes (r(5) = 0.889, p = 0.044).

The trend of incorporating modern technologies in a scalable fashion in education has been around for several decades. The latest addition are programmes that can compose essays using online information. As soon as students learned to use ChatGPT and educators realised its double-edge sword nature, researchers started carrying out research to examine attitudes towards ChatGPT's potential plagiarist nature. Despite many educational benefits, the most recent research (Chan, 2023; Chan & Hu, 2023; Cotton et al., 2023) reports a students' wide understanding of academic misconduct when using ChatGPT. Students clearly disapprove of using it to form the entire text but have more ambivalent attitudes towards subtler uses. Our result supports such a finding because 58.4% of the participants do not perceive the use of AI when doing their papers and reports as plagiarism. Those attitudes are a warning sign because they can potentially lead to more serious educational problems.

Conclusions

The aim of this research was to elaborate on the contemporary situation in terms of using digital dictionaries and AI tools in ESP education from the perspective of computer engineering students as dictionary and AI tool users. The participants' scope - university students studying at one higher education institution in Croatia - is the main limitation of the research. The present research shows that computer engineering students heavily rely on digital resources but do not use them as much as they could. In spite of different dictionary types being freely available to them, the students use the most convenient one, which is not always the most accurate one; however, they are aware of it and choose the convenient and faster option as opposed to the most accurate one. Less experienced students use digital dictionaries for receptive skills and vocabulary acquisition, while more experienced ones use them for productive skills. Female students are more worried about what kind of language they use, so they consult dictionaries more than their male counterparts. The research also shows that the students use digital dictionaries when they have to, i.e. juniors are obliged to conduct research and do a final paper whose theoretical background is usually in English. This can have some pedagogical implications and encourage ESP teachers to assign more tasks involving research in the foreign language.

The research sheds light on the students' broad and vague understanding of the term digital dictionary and points to them not recognising the line between digital tools/dictionaries and AI-based tools. Not all AI-based tools are positively perceived by our participants, i.e. some AI-based tools (e.g. pronunciation ones) are rarely used in spite of their advantages. Female students are generally more worried about the negative consequences AI tools will have on their language skills and interaction in general, but all students recognise potential consequences of using AI in language learning and skills like critical thinking and creativity. The students recognise the potential of AIEd; however, they believe AI-based tools should be used only as supplementary materials for language learning. On the other hand, the students are more ready to use translation tools as a primary translation source. These findings might help language educators in planning and organizing their classes.

The students are familiar with the emerging Al tools of chatbots and ChatGPT. The least experienced students use chatbots more than others do because it reduces their fear of publicly making mistakes and peer pressure as well as boosts confidence. The students started using ChatGPT whose subtle usages are not perceived as problematic. Naturally, to define what is a subtle usage is very subjective, so even subtle usages of someone else's intellectual property are a warning sign and can potentially lead to more serious academic misconduct.

Notwithstanding a proliferation of AI-related studies in language learning, there is a relative paucity of longitudinal studies on the effectiveness of AI in ESP/EFL contexts involving language instructors and different profile students. It would be interesting to examine if a study programme is a significant variable. Our research methodology can be replicated in research involving students from other countries. Moreover, it would be interesting to examine if a native language or participants' culture plays any role or are our findings universal. Further research should be conducted on the adaptability of AI to students' learning needs (motivation, online vs offline learning vs flipped classrooms) and translating preferences as well as its effect on using digital dictionaries. Future research should shed some new light on the pedagogical and ethical implications of using AI in language learning.

References

Abbasi, P. (2022). The effectiveness of integrating CALL into EFL contexts. *Advance in Environmental Waste Management and Recycling*, *5*(1), 13–18. https://doi.org/10.33140/aewmr.05.01.02

Alam, A. (2022). Employing adaptive learning and intelligent tutoring robots for virtual classrooms and smart campuses: Reforming education in the age of artificial intelligence. In R. N. Shaw, S. Das, V. Piuri, & M. Bianchini (Eds.), Advanced Computing and Intelligent Technologies. Proceedings of ICACIT 2022 (pp. 395–406). Springer Nature. https://doi.org/10.1007/978-981-19-2980-9 32

Alhatmi, S. (2019). A survey study of the dictionary use sub-strategies of English majors in Saudi Arabia: Dictionary related aspects. *English Language Teaching*, *12*(3), 139–160. https://doi.org/10.5539/elt.v12n3p139

Alian, J., Khodabandeh, F., & Soleimani, H. (2018). The effect of call-based tasks on EFL learners' grammar learning. *Teaching English with Technology*, *18*(3), 54–68.

Alqahtani Mofareh, A. (2019). The use of technology in English language teaching. *Frontiers in Education Technology*, 2(3), 168–180. https://doi.org/10.22158/fet. v2n3p168

Andujar, A. (2019). Recent tools for computer- and mobileassisted foreign language learning. IGI Global.

Bahri, H., & Mahadi, T. S. T. (2016). Google translate as a supplementary tool for learning Malay: A case study at Universiti Sains Malaysia. *Advances in Language and Literary Studies*, *7*(3), 161–167. https://doi.org/10.7575/aiac. alls.v.7n.3p.161

Belda-Medina, J., & Calvo-Ferrer, J. R. (2022). Using Chatbots as AI conversational partners in language learning. Applied Sciences, 12(17), 8427. https://doi.org/10.3390/ app12178427

Belpaeme, T., Kennedy, J., Ramachandran, A., Scassellati, B., & Tanaka, F. (2018). Social robots for education: A review. *Science Robotics*, *3*(21). https://doi.org/10.1126/ scirobotics.aat5954

Bibauw, S., François, T., & Desmet, P. (2022). Dialogue systems for language learning: Chatbots and beyond. In N. Ziegler, & M. González-Lloret (Eds.). *The Routledge handbook of second language acquisition and technology* (pp. 121–134). Routledge. https://doi.org/10.4324/9781 351117586-12

Bin Dahmash, N. (2020). 'I Can't Live Without Google Translate': A close look at the use of Google Translate app by second language learners in Saudi Arabia. *Arab World English Journal*, *11*(3), 226–240. https://doi.org/10.24093/ awej/vol11no3.14

Bonaccorsi, A. (2023). Benefits of Artificial Intelligence in education. *Journal of Research and Development*, *11*, 239.

Božić Lenard, D. (2023). *Gender differences in congressional speeches*. Ethics Press Publishing.

Çakmak, F. (2022). Chatbot-human interaction and its effects on EFL students' L2 speaking performance and anxiety. *Research on Youth and Language*, *16*(2), 113–131.

Chan, C. K. Y. (2023). Is AI changing the rules of academic misconduct? An in-depth look at students' perceptions of 'Al-giarism'. https://doi.org/10.48550/arXiv.2306.03358

Chan, C. K. Y., & Hu, W. (2023). Students' voices on generative AI: perceptions, benefits, and challenges in higher education. *International Journal of Educational Technology in Higher Education*, 20(43). https://doi.org/10.1186/s41239-023-00411-8

Chaudhry, M. A., & Kazim, E. (2022). Artificial Intelligence in Education (AIEd): A high-level academic and industry note 2021. *AI Ethics*, *2*, 157–165. https://doi. org/10.1007/s43681-021-00074-z

Chen, Y., Smith, T. J., York, C. S., & Mayall, H. J. (2020). Google earth virtual reality and expository writing for young English learners from a funds of knowledge perspective. *Computed Assisted Language Learning*, *33*, 1–25. https://doi.org/10.1080/09588221.2018.1544151

Chompurach, W. (2021). "Please let me use Google Translate": Thai EFL Students' behavior and attitudes toward Google Translate use in English writing. *English Language Teaching*, *14*(12), 23–35. https://doi.org/10.5539/ elt.v14n12p23

Cornell, R., Dean, J., & Tomaš, Z. (2016). Up close and personal: A case study of three university-level second language learners' vocabulary learning experiences. *TESOL Journal*, *7*(4), 823–846. https://doi.org/10.1002/tesj.247

Cotton, D. R. E., Cotton, P. A., & Shipway, J. R. (2023). Chatting and cheating: ensuring academic integrity in the era of ChatGPT. *Innovations in Education and Teaching International*, 61(2), 228–239. https://doi.org/10.1080/14 703297.2023.2190148

Darwin, Rusdin, D., Mukminatien, N., Suryati, N., Laksmi, E. D., & Marzuki (2024). Critical thinking in the Al era: An exploration of EFL students' perceptions, benefits, and limitations. *Cogent Education*, *11*(1). https://doi. org/10.1080/2331186X.2023.2290342

Dillon, T., & Wells, D. (2021). Student perceptions of mobile automated speech recognition for pronunciation study and testing. *English Teaching*, *76*(4), 101–122. https://doi.org/10.15858/engtea.76.4.202112.101

Ebadi, S., & Ebadijalal, M. (2020). The effect of google expeditions virtual reality on EFL learners' willingness to communicate and oral proficiency. *Computer Assisted Language Learning*, *35*(8), 1975–2000. https://doi.org/10. 1080/09588221.2020.1854311

Fitria, R-A., Sabarun, & Miftah, M. Z. (2022). Students' perception of the use of grammarly in undergraduate thesis writing. *Professional Journal of English Education*, 5(2), 366–371. https://doi.org/10.22460/project.v5i2. p366-371

Fitriana, K., & Nurazni, L. (2022). Exploring Students' perceptions on using grammarly to check the grammar in their writing. *Journal of English Teaching*, *8*(1), 15–25. https://doi.org/10.33541/jet.v8i1.3044

Fryer, L., Coniam, D., Carpenter, R., & Lăpușneanu, D. (2020). Bots for language learning now: Current and future directions. *Language Learning and Technology*, *24*(2), 8–22.

Glušac, T., & Milić, M. (2020). How university teachers of English for Specific Purposes and their students employ dictionaries in teaching and learning. *Annual Review of the Faculty of Philosophy*, 45(5), 281–295. https://doi. org/10.19090/gff.2020.5.281-295

Gumartifa, A., Yuliani, S., Marliasari, S., & Tarmizi, M. (2022). English language translation through students' opinions toward Google Translate Machine in the EFL Class. *English Education Journal*, *12*(4), 479–488. https://doi. org/10.15294/eej.v12i4.65314

Habib, S., Vogel, T., Anli, X., & Thorne, E. (2024). How does generative artificial intelligence impact student creativity? *Journal of Creativity*, 34(1), 100072. https://doi.org/10.1016/j.yjoc.2023.100072

Hew, K. F., Huang, W., Du, J., & Jia, C. (2023). Using chatbots to support student goal setting and social presence in fully online activities: learner engagement and perceptions. *Journal of Computing in Higher Education*, 35, 40–68. https://doi.org/10.1007/s12528-022-09338-x

Hohenstein, J., Kizilcec, R. F., DiFranzo, D., Aghajari, Z., Mieczkowski, H., Levy, K., Naaman, M., Hancock, J., & Jung, M. F. (2023). Artificial intelligence in communication impacts language and social relationships. *Scientific Reports*, *13*, 5487. https://doi.org/10.1038/s41598-023-30938-9

Holi Ali, H. I. (2012). Monolingual dictionary use in an EFL context. *English Language Teaching*, 5(7), 2–7. https://doi.org/10.5539/elt.v5n7p2

Huang, X., Zou, D., Cheng, G., Chen, X., & Xie, H. (2023). Trends, research issues and applications of artificial intelligence in language education. *Educational Technology and Society*, *26*(1), 112–131. https://www.jstor. org/stable/48707971

Hwang, G.-J., Xie, H., Wah, B. W., & Gašević, D. (2020). Vision, challenges, roles and research issues of artificial intelligence in education. *Computers and Education: Artificial Intelligence*, *1*, 10001. https://doi.org/10.1016/ j.caeai.2020.100001

Hwang, W. Y., Nguyen, V. G., & Purba, S. W. D. (2022). A systematic survey of anything-to-text recognition and constructing its framework in language learning. *Education and Information Technologies*, *27*, 12273–12299. https://doi.org/10.1007/s10639-022-11112-6

Jiang, R. (2022). How does artificial intelligence empower EFL teaching and learning nowadays? A review on artificial intelligence in the EFL context. *Frontiers in Psychology*, 13. https://doi.org/10.3389/ fpsyg.2022.1049401 Kamalov, F., Calonge, D. S., & Gurrib, I. (2023). New era of Artificial Intelligence in education: Towards a sustainable multifaceted revolution. *Sustainability*, *15*(16), 12451. https://doi.org/10.3390/su151612451

Karlina Y., Rahman A., & Chowdhury R. (2020). Designing Phonetic Alphabet for Bahasa Indonesia (PABI) for the teaching of intelligible English pronunciation in Indonesia. *Indonesian Journal of Applied Linguistics*, 9(3), 724–732. https://doi.org/10.17509/ijal.v9i3.23223

Karyuatry, L. (2018). Grammarly as a tool to improve students' writing quality: Free online-proofreader across the boundaries. *Jurnal Sains Sosial dan Humaniora*, 2(1), 83–89. https://doi.org/10.30595/jssh.v2i1.2297

Kazu, I. Y., & Kuvvetli, M. (2023). The influence of pronunciation education via Artificial Intelligence technology on vocabulary acquisition in Learning English. *International Journal of Psychology and Educational Studies*, 10(2), 480–493. https://doi.org/10.52380/ijpes.2023.10.2.1044

Kim, N. Y. (2020). Chatbots and language learning: Effects of the use of al chatbots for EFL learning. Eliva Press.

Kim, H. S., Cha, Y., & Kim, N. Y. (2021). Effects of Ai chatbots on EFL students' communication skills. *Korean Journal of English Language and Linguistics*, *21*, 712–734. https://doi.org/10.15738/kjell.21..202108.712

Klimova, B., & Seraj, P. M. I. (2023). The use of chatbots in university EFL settings: Research trends and pedagogical implications. *Frontiers in Psychology*, *14*(1146), 1–7. https://doi.org/10.3389/fpsyg.2023.1131506

Knežević, L., Halupka-Rešetar, S., Miškeljin, I., & Milić, M. (2021). Millennials as dictionary users: A study of dictionary use habits of Serbian EFL students. *SAGE Open*, *11*(2). https://doi.org/10.1177/2158244021100 8422

Knežević, L., Miškeljin, I., & Halupka-Rešetar, S. (2019). The use of dictionaries in teaching English for specific purposes from the teachers' perspective. In S. Gudurić, & B. Radić Bojanić (Eds.), *Languages and Cultures in Time and Space* 8 (pp. 489–494). Filozofski fakultet.

Kong, L. (2022). Artificial Intelligence-based translation technology in translation teaching. *Computational Intelligence and Neuroscience*, 6016752. https://doi. org/10.1155/2022/6016752

Kushmar, L. V., Vornachev, A. O., Korobova, I. O., & Kaida, N. O. (2022). Artificial Intelligence in language learning: What are we afraid of. *Arab World English Journal*, *8*, 262–273. https://doi.org/10.24093/awej/call8.18

Lai, K.-W. K., & Chen, H.-J. H. (2021). A comparative study on the effects of a VC and PC visual novel game on vocabulary learning. *Computer Assisted Language Learning*, *34*, 312–345. https://doi.org/10.1080/09588221.2021. 1928226

Le, T. K. V., & Dao, T. M. T. (2019). An investigation into students' perception of utilizing digital dictionaries in translation-interpretation. *Revista Espacios*, *40*(39), 2–10. https://www.revistaespacios.com/a19v40n39/19403902. html

Lee, J. S. (2021). Informal digital learning of English: Research to practice. Routledge. https://doi.org/10.4324/ 9781003043454

Lei, X., Fathi, J., Noorbakhsh, S., & Rahimi, M. (2022). The impact of mobile-assisted language learning on English as a foreign language learners' vocabulary learning attitudes and self-regulatory capacity. *Frontiers in Psychology*, *13*, 872922. https://doi.org/10.3389/ fpsyg.2022.872922 Mahmoud, R. H. (2022). Implementing Al-based conversational chatbots in EFL speaking classes: an evolutionary perspective. *Research Square*. https://doi.org/10.21203/rs.3.rs-1911791/v1

10 M I

A 10 A 10

Marrone, R., Taddeo, V., & Hill, G. (2022). Creativity and Artificial Intelligence – A student perspective. *Journal of Intelligence*, *10*(3), 65. https://doi.org/10.3390/jintelligence10030065

Mohamed, S. S. A., & Alian, E. M. I. (2023). Students' attitudes toward using Chatbot in EFL learning. *Arab World English Journal*, *14*(3), 15–27. https://doi.org/10.2139/ ssrn.4591887

Mohammadzadeh, A., & Sarkhosh, M. (2018). The effects of self-regulatory learning through computer-assisted intelligent tutoring system on the improvement of EFL learners' speaking ability. *International Journal of Instruction*, *11*(2), 167–184. https://doi.org/10.12973/ iji.2018.11212a

Muqadas, T., & Nawaz, S. (2022). Effect of gender discrimination on linguistic behavior. *PalArch's Journal of Archaeology of Egypt/Egyptology*, *19*(3), 196–222. https://www.archives.palarch.nl/index.php/jae/article/ view/11190

Muthmainnah, S., Ibna Seraj, P. M., & Oteir, I. (2022). Playing with AI to investigate human-Computer interaction technology and improving critical thinking skills to pursue 21st Century age. *Education Research International*, *10*, 1–17. https://doi.org/10.1155/2022/6468995

Nghi, T. T., Phuc, T. H., & Thang, N. T. (2019). Applying AI chatbot for teaching a foreign language: an empirical research. *International Journal of Scientific and Technology Research*, 8(12), 897–902.

Niitemaa, M. L., & Pietilä, P. (2018). Vocabulary skills and digital dictionaries: A study on EFL learners' receptive vocabulary knowledge and success in searching electronic sources for information. *Journal of Language Teaching and Research*, 9(3), 453–462. https://doi.org/10.17507/ jltr.0903.02

O'Neill, R., & Russell, A. (2019). Stop! Grammar time: University students' perceptions of the automated feedback program Grammarly. *Australasian Journal of Educational Technology, 35*(1). https://doi.org/10.14742/ ajet.3795

Pedro, F., Subosa, M., Rivas, A., & Valverde, P. (2019). Artificial intelligence in education: Challenges and opportunities for sustainable development. UNESCO. https://unesdoc. unesco.org/ark:/48223/pf0000366994

Pikhart, M. (2020). Intelligent information processing for language education: the use of artificial intelligence in language learning apps. *Procedia Computer Science*, *176*, 1412–1419. https://doi.org/10.1016/j.procs.2020.09.151

Pikilnyak, A. V., Stetsenko, N. M., Stetsenko, V. P., Bondarenko, T. V., & Tkachuk, H. V. (2021). Comparative analysis of digital dictionaries in the context of the digital transformation of education. *CTE Workshop Proceedings*, 8, 70–81. https://doi.org/10.55056/cte.204

Raheem, B. R. (2020). The role of machine translation in language learning. *International Journal of Academic Research*, 7(4), 2348–7666.

Rodway, P., & Schepman, A. (2023). The impact of adopting AI educational technologies on projected course satisfaction in university students. *Computers and Education: Artificial Intelligence*, *5*, 100150. https://doi.org/10.1016/j.caeai.2023.100150

Selcuk, H., & Daniela, L. (2022). The use of digital dictionaries during web-based collaborative writing among EFL learners. In L. Daniela (Eds.), *To be or not to be a great educator. Proceedings of ATEE Annual Conference* (pp. 483–493). https://doi.org/10.22364/atee.2022.32

Shadiev, R., Wen, Y., Uosaki, N., & Song, Y. (2023). Future language learning with emerging technologies. *Journal of Computers in Education*, *10*, 463–467. https://doi. org/10.1007/s40692-023-00285-9

Shadiev, R., & Yang, M. (2020). Review of studies on technology-enhanced language learning and teaching. *Sustainability*, *12*(2), 524. https://doi.org/10.3390/ su12020524

Shafira, L. J. (2022). A study about language used toward gender differences between females and males in social context. *Journal of Language Teaching and Learning, Linguistics and Literature*, 10(1), 753–764. https://doi.org/10.24256/ideas.v10i1.2648

Silvestru, C. I., Firulescu, A. C., Iordoc, D. G., Icociu, V. C., Stoica, M. A., Platon, O. E., & Orzan, A. O. (2022). Smart academic and professional education. *Sustainability*, *14*(11), 6408. https://doi.org/10.3390/su14116408

Spring, R., & Tabuchi, R. (2021). Assessing the practicality of using an automatic speech recognition tool to teach English pronunciation online. *STEM Journal, 22*(2), 93–104. https://doi.org/10.16875/stem.2021.22.2.93

Tahriri, A., & Ariyan, Z. (2015). Use of monolingual, bilingual, and bilingualised dictionaries and EFL learners' vocabulary learning strategies: A case study. *Issues in Language Studies*, 4(1), 75–89. https://doi.org/10.33736/ ils.1647.2015

Tai, T.-Y., Chen, H. H.-J., & Todd, G. (2020). The impact of a virtual reality app on adolescent EFL learners' vocabulary learning. *Computer Assisted Language Learning*, *35*(4), 892–917. https://doi.org/10.1080/09588221.2020 .1752735

Tanjung, A. P., & Daulay, S. H. (2023). Exploring students' perceptions of using the application Digital dictionary. *Journal Ilmu Pendidikan (JIP) STKIP Kusuma Negara*, *15*(1), 84–90. https://doi.org/10.37640/jip.v15i1.1671

Tight, D. G. (2017). Tool usage and effectiveness among L2 Spanish computer writers. *ELIA: Estudios de*

.

Lingüística Inglesa Aplicada, 17, 157–182. https://doi. org/10.12795/elia.2017.i17.07

- - - - - -

Tsai, S.-C. (2022). Chinese students' perceptions of using Google Translate as a translingual CALL tool in EFL writing. *Computer Assisted Language Learning*, 35(5–6), 1250–1272. https://doi.org/10.1080/09588221.2020.1 799412

Waloyo, A. A., Prastiyowati, S., & Rizki Pahlevi, N. (2021). The use of internet-based dictionary in reading activity for English language education department students. *AMCA Journal of Education and Behavioral Change*, *1*(2), 33–40. https://doi.org/10.51773/ajeb.v1i2.98

Wang, S., Sun, Z., & Chen, Y. (2023). Effects of higher education institutes' artificial intelligence capability on students' self-efficacy, creativity and learning performance. *Education and Information Technologies*, 28(5), 4919–4939. https://doi.org/10.1007/s10639-022-11338-4

Wilkens, U. (2020). Artificial intelligence in the workplace – a double-edged sword. *International Journal of Information and Learning Technology*, *37*(5), 253–265. https://doi.org/10.1108/ijilt-02-2020-0022

Wuttikrikunlaya, P., Singhasiri, W., & Keyuravong, S. (2018). The use of online tools in L2 writing: A study of Thai University students. *Journal of English Language Teaching and English Linguistics*, 30(1), 107–148.

Xu, Z., Wijekumar, K., Ramirez, G., Hu, X., & Irey, R. (2019). The effectiveness of intelligent tutoring systems on K-12 students' reading comprehension: A metaanalysis. *British Journal of Educational Technology*, *50*(6), 3119–3137. https://doi.org/10.1111/bjet.12758

Yin, Q., & Satar, M. (2020). English as a foreign language learner interaction with chatbots: Negotiation for meaning. *International Online Journal of Education and Teaching*, 7(2), 390–410. http://iojet.org/index.php/IOJET/ article/view/707

York, J., Shibata, K., Tokutake, H., & Nakayama, H. (2021). Effect of SCMC on foreign language anxiety and learning experience: a comparison of voice, video, and VR-based oral interaction. *ReCALL*, *33*, 49–70. https://doi.org/10.1017/S0958344020000154

Dragana Božić Lenard obtained her PhD in Linguistics from the Faculty of Humanities and Social Sciences in Osijek. She is the head of the sub-department at the Faculty of Electrical Engineering, Computer Science and Information Technology Osijek where she works as an assistant professor and teaches ESP courses. Her research interests include ESP, sociolinguistics and computational linguistics. She is the author of one scientific monograph and more than 20 research papers published in international journals. She is a member of scientific and editorial committees in several international journals.

Katarina Šokčević obtained her Bachelor's degree in Computer Engineering from the Faculty of Electrical Engineering, Computer Science and Information Technology Osijek and her Master's degree from the aforementioned institution. She is interested in (developing) digital tools for language learning and translation.



Е.	Ertugrul
	Karsak



Ece Ucar

Education policy assessment of countries using an integrated decision-making approach

Abstract

As governments strive to provide flawless and unbiased education to students while using resources in an efficient and sustainable manner, assessing countries' educational performance has become a prevailing topic, and the rising relevance of achieving this aim encourages the use of multi-criteria decision-making (MCDM) tools. This article presents an integrated approach using the Evaluation Based on Distance from Average Solution (EDAS) method in combination with the Best-Worst Method (BWM) to compare the educational performance in European Union member states. The performance assessment criteria are derived from the Programme for International Student Assessment (PISA) 2018 database and the UNESCO Institute for Statistics 2018 database. The research takes into account not only PISA test results but also further crucial features, including the teachers/students ratio, learning time, and government expenditure on primary education as a proportion of GDP, with the criteria weights computed using the linear version of BWM. The proposed approach, which uses EDAS in combination with BWM weights, produces a complete ranking of the evaluated EU nations, and also determines the best-performing country in terms of education. In order to illustrate the robustness of the proposed decision framework, a comparative analysis of the obtained rankings with the outcomes of other well-established distance-based MCDM methods is provided.

Keywords: educational performance of countries, performance assessment, MCDM, Best-Worst Method, EDAS

Introduction

Governments set forth educational policies to uphold the goal of creating more effective and equitable educational systems, as proposed by the United Nations Development Programme (UNDP) in September 2015, which aims to ensure "inclusive and equitable quality education for all" (OECD, 2019). The Organisation for Economic Cooperation and Development (OECD) is in charge of generating statistics on the metrics that represent Sustainable Development Goal (SDG) 4, and the Programme for International Student Assessment (PISA) is a key instrument promoting these efforts by advancing indicators, and thereby assessing progress toward SDG 4 attainment.

PISA, a triennial assessment of international education systems established in collaboration with the OECD, delivers significant information regarding the achievements of 15-year-old students in PISA tests and the factors that impact the education quality of students to measure the educational performance of countries. PISA primarily publishes student test scores in reading, mathematics and science, as well as various indications and indices demonstrating students' educational resources, and social, economic and cultural circumstances (OECD, 2019).

Education is regarded as a significant pillar of the knowledge economy under the World Bank Knowledge Assessment Methodology (KAM) (Amavilah & Rodriguez Andrés, 2022). As a result, the evaluation of nations' educational performance may be used as a tool to track national progress in boosting the knowledge economy, and the development of the knowledge economy and the widespread acceptance of PISA as

E. Ertugrul Karsak, Galatasaray University, Türkiye, D https://orcid.org/0000-0002-3921-6189 Ece Ucar, Galatasaray University, Türkiye, D https://orcid.org/0000-0001-6516-563X

.

a worldwide benchmark have drawn attention from around the world for reforming educational systems, and there even exists a significant link between PISA and the economic progress of nations. In their study, Hanushek and Woessmann (2020) showed that enhancing student performance by 25 PISA points across the EU would provide \in 71 trillion in present value to the EU's Gross Domestic Product (GDP) compared to the current situation. Another noteworthy aspect of PISA worth mentioning is that the evolving methods of educational governance in schools are affected by PISA within the context of the rising spatialities of globalisation (Lewis & Lingard, 2022).

Multi-criteria decision making (MCDM) has been used in certain works to assess and compare the performance of schools and/or countries using PISA data. Stamenković et al. (2016) evaluated Serbian secondary schools using the ELECTRE multi-level outranking (ELECTRE MLO) method and PISA data, while Aparicio et al. (2018) used the non-radial Data Envelopment Analysis (DEA) model to compare the academic performance of 34 nations using PISA 2012 datasets, and using PISA data from the years 2006–2018, Aparicio et al. (2022) compared the academic performance of Latin American nations. The Best-Worst PROMETHEE method was proposed by Ishizaka & Resce (2021) to analyse the performance of the 66 countries that took part in the PISA survey using three indicators, including reading, maths and science scores. Ucar and Karsak (2021) used common-weight DEA-based models, along with PISA 2018 data, to conduct a comparative analysis of countries within the OECD.

This study compares the educational performance of EU member states using an integrated decision methodology based on the Evaluation Based on Distance from Average Solution (EDAS) method. Developed by Keshavarz-Ghorabaee et al. (2015), this method is an MCDM approach that assesses the alternatives by computing the positive distance from the average solution (PDA) and negative distance from the average solution (NDA). As opposed to other methods, such as TOPSIS (Technique for Order of Preference by Similarity to Ideal Solution) and VIKOR, which use the distance to the ideal and anti-ideal solutions, EDAS uses the distance to the average solution. Higher values of PDA and/or lower values of NDA denote that the alternative is preferred to the average solution. In comparison to outranking methods, such as ELECTRE and PROMETHEE, which evaluate the preferences between each pair of alternatives (Gebre et al., 2021), the EDAS method is a distance-based MCDM method that assesses alternatives according to their positive and negative distances to the average solution.

As the EDAS method is dependent on weighted criteria values, it is crucial to use an appropriate weighting method. There are a number of weighting methods delineated in the literature that may be categorised into two primary groups as subjective weighting and objective weighting approaches. The well-known subjective weighting methods comprise the Analytic Hierarchy Process (AHP) (Saaty, 1977), the Analytic Network Process (ANP) (Saaty, 2004), the Delphi method (Hwang & Lin, 1987), the stepwise weight assessment ratio analysis (SWARA) (Keršuliene et al., 2010), and the factor relationship (FARE) (Ginevicius, 2011). Although these techniques help to reflect the opinions of experts, the consistency of pairwise comparisons must be justified for a sound evaluation. The entropy method (Shannon, 1948), the LINMAP method (Srinivasan & Shocker, 1973), and mathematical programming-based techniques (Pekelman & Sen, 1974) are objective weighting methods.

The Best-Worst Method (BWM) is used in this study to determine the criteria weights for the educational performance assessment. Introduced by Rezaei (2015), it is one of the lately proposed methods for weighting criteria, and is a comparison-based method that possesses two merits, namely demanding fewer comparisons, which are also relatively more consistent. The AHP requires n(n-1)/2 pairwise comparisons to determine the weights of criteria, where n denotes the number of criteria. However, as determining the preference of the best criterion over the remaining criteria and the preference of all other criteria over the worst criterion are sufficient to calculate the weights of criteria in BWM, only (2n-3) comparisons are performed. Rezaei (2015) also demonstrated with numerical examples that BWM yields more consistent comparisons than AHP. In this study, BWM designates criteria weights to be used in the EDAS method, which will be used to evaluate the educational performance of EU member states.

The remaining sections of the manuscript are organised as follows. The fundamentals of the EDAS method are presented in the following section, while the steps of BWM are explained in the subsequent section, followed by a case study concerning the evaluation of educational performance in EU nations using the proposed integrated decision approach. The results of the analysis are then compared with those of other widely used distance-based MCDM methods, with a summary and conclusions provided in the final section.

Evaluation Based on Distance from Average Solution Method

Evaluation Based on Distance from Average Solution (EDAS) is an MCDM technique initially proposed by Keshavarz-Ghorabaee et al. (2015) that assesses alternatives by computing the positive distances and the negative distances from the average solution. EDAS is viewed as a valuable approach where the decision-maker is faced with opposing criteria (Keshavarz-Ghorabaee et al., 2015). In MCDM techniques such as TOPSIS and VIKOR, which propose compromise solutions, the best solution is determined by computing the alternatives' distance from the ideal solution and the anti-ideal solution (Keshavarz-Ghorabaee et al., 2015). According to these methods, the best alternative is deemed to be near to the ideal solution and farther from the anti-ideal solution, whilst in EDAS, alternatives are assessed employing the positive distance from average (PDA) and the negative distance from average (NDA) measures. The alternative solution is deemed to be superior to the average solution when there are higher values of PDA and/or lower values of NDA. Considering m alternatives to be assessed based on n criteria, the eight stages of the method are provided below.

- (1) Determine the set of criteria that are essential for assessing alternatives.
- (2) Establish the decision matrix X given below, considering *m* alternatives and *n* criteria.

$$\mathbf{X} = \begin{bmatrix} x_{11} & \cdots & x_{1j} & \cdots & x_{1n} \\ \vdots & \ddots & \vdots & \ddots & \vdots \\ x_{i1} & \cdots & x_{ij} & \cdots & x_{in} \\ \vdots & \ddots & \vdots & \ddots & \vdots \\ x_{m1} & \cdots & x_{mj} & \cdots & x_{mn} \end{bmatrix}, i = 1, \dots, m; j = 1, \dots, n.$$
(1)

Here, x_{ij} is the performance value of alternative *i* with respect to criterion *j*.

(3) Compute the average solution for each criterion as

$$AV = \left[AV_j\right]_{1xn'}, \qquad j = 1, \dots n,$$
(2)

where

$$AV_{j} = \frac{\sum_{i=1}^{m} x_{ij}}{m}, \qquad j = 1, \dots n.$$
(3)

Here, AV_j , which represents the average solution for criterion *j*, is calculated as the average of column *j* of the decision matrix **X**.

(4) Determine the positive distance from the average (PDA) and the negative distance from the average (NDA) matrices taking into account the benefit and cost criteria, respectively as

$$PDA = [PDA_{ij}]_{mxn'}, \quad i = 1, ..., m; j = 1, ..., n,$$
 (4)

$$NDA = [NDA_{ij}]_{mxn}, \quad i = 1, ..., m; j = 1, ..., n,$$
 (5)

If criterion *j* is a benefit criterion, then

$$PDA_{ij} = \frac{\max\left(0, (x_{ij} - AV_j)\right)}{AV_j}, i = 1, ..., m; j = 1, ..., n,$$
(6)

$$NDA_{ij} = \frac{max \left(0, \left(AV_j - x_{ij}\right)\right)}{AV_j}, i = 1, \dots, m; j = 1, \dots, n,$$
(7)

If criterion *j* is a cost criterion, then

$$PDA_{ij} = \frac{max \left(0, \left(AV_j - x_{ij}\right)\right)}{AV_j}, i = 1, ..., m; j = 1, ..., n,$$
(8)

$$NDA_{ij} = \frac{max (0, (x_{ij} - AV_j))}{AV_j}, i = 1, ..., m; j = 1, ..., n,$$
(9)

where PDA_{ij} and NDA_{ij} denote positive and negative distances from the average solution for the *i*-th alternative for the *j*-th criterion, respectively. Here, x_{ij} indicates the performance value of alternative *i* regarding criterion *j*, and AV_j denotes the average solution for criterion *j*.

(5) Determine the weighted sum of PDA and NDA for each alternative as follows:

$$SP_i = \sum_{j=1}^n w_j PDA_{ij}, \qquad i = 1, ..., m,$$
 (10)

$$SN_i = \sum_{j=1}^n w_j NDA_{ij}, \quad i = 1, ..., m,$$
 (11)

where w_j is the weight of criterion *j*. SP_i represents the weighted sum of PDA_{ij} values, and SN_i denotes the weighted sum of NDA_{ij} values.

(6) Determine the normalized values of *SP_i* and *SN_i* for each alternative as shown below.

$$NSP_i = \frac{SP_i}{max_i(SP_i)}, \qquad i = 1, \dots, m,$$
(12)

$$NSN_i = 1 - \frac{SN_i}{max_i(SN_i)}, \quad i = 1, ..., m.$$
 (13)

*NSP*_{*i*} and *NSN*_{*i*} represent the normalized values of *SP*_{*i*} and *SN*_{*i*}, respectively.

(7) Calculate the appraisal score (AS) for each alternative as

$$AS_i = \frac{1}{2}(NSP_i + NSN_i), \quad i = 1, ..., m,$$
 (14)

where $0 \le AS_i \le 1$.

The appraisal scores for the alternatives are computed as the arithmetic mean of *NSP*_i and *NSN*_i.

(8) Rank the alternatives for the appraisal scores (AS) in decreasing order. The alternative possessing the highest AS is determined as the best performer among the set of alternatives.

Best-Worst Method

.

In the case of MCDM problems, the degree of importance of the criteria is crucial for their appropriate consideration while evaluating the alternatives. BWM, which is a comparison-based approach, is regarded as an efficient technique that produces fewer and more consistent comparisons (Rezaei, 2015). n(n-1)/2 pairwise comparisons are conducted in AHP to determine the weights of criteria, with n denoting the number of criteria. In BWM, however, only (2n–3) comparisons are necessary, since identifying the preference of the best criterion over the remaining criteria and the preference of all other criteria over the worst criterion is adequate to generate a set of criteria weights. Rezaei (2015) supported the argument that BWM yields more consistent comparisons than AHP with various numerical illustrations. The stepwise procedure of BWM is delineated below.

.

.

- (1) Identify *n* criteria for assessing alternatives.
- (2) Determine the best (i.e. most desirable or most important) and the worst (i.e. least desirable or least important) criteria.
- (3) Indicate the preference of the best criterion over the remaining criteria, using a scale of 1 to 9. The best-to-others (BO) vector is

$$A_B = [a_{B1}, a_{B2}, \dots, a_{Bn}] \tag{15}$$

where a_{Bj} represents the preference of the best criterion (B) over criterion *j*.

(4) Indicate the preference of all other criteria over the worst criterion, using a scale of 1 to 9. The others-to-worst (OW) vector is obtained as

$$A_W = [a_{1W}, a_{2W}, \dots, a_{nW}]^T$$
(16)

where a_{jW} denotes the preference of criterion *j* over the worst criterion (W).

(5) Determine the optimal weights for *n* criteria $(w_1^*, w_2^*, ..., w_n^*)$.

$$\min\max_{j}\left\{ \left| \frac{w_B}{w_j} - a_{Bj} \right|, \left| \frac{w_j}{w_W} - a_{jW} \right| \right\}$$
(17)

s.t.

$$\sum_{j=1}^n w_j = 1$$

 $w_i \ge 0, \quad \forall j$

Formulation (17) is akin to the model given below.

$$min \xi$$

s.t.

.....

$$\begin{aligned} \left|\frac{w_B}{w_j} - a_{Bj}\right| &\leq \xi, \qquad j = 1, 2, \dots, n\\ \left|\frac{w_j}{w_W} - a_{jW}\right| &\leq \xi, \qquad j = 1, 2, \dots, n\\ \sum_{j=1}^n w_j &= 1\\ w_i &\geq 0, \qquad \forall j, \end{aligned}$$

where the optimal weights of the criteria are obtained by minimising the maximum of the absolute

.

differences $\left|\frac{w_B}{w_j} - a_{Bj}\right|$, $\left|\frac{w_j}{w_W} - a_{jW}\right|$ for all criteria. Rezaei (2016) demonstrated that formulation (18) can yield multiple optimal solutions, leading to the introduction of the following model for BWM.

$$\min \max_{j} \{ |w_{B} - a_{Bj} w_{j}|, |w_{j} - a_{jW} w_{W}| \}$$
(19)

s.t.

$$\sum_{j=1}^{n} w_j = 1$$
$$w_i \ge 0, \quad \forall j.$$

Accordingly, formulation (19) is transformed to the linear model given below.

$$\min \xi^L \tag{20}$$

s.t.

$$\begin{split} |w_B - a_{Bj}w_j| &\leq \xi^L, \qquad j = 1, 2, \dots, n\\ |w_j - a_{jW}w_W| &\leq \xi^L, \qquad j = 1, 2, \dots, n\\ \sum_{j=1}^n w_j &= 1\\ w_j &\geq 0, \qquad \forall j. \end{split}$$

In the linear model of BWM, ξ^L is deemed as an indicator of the consistency of the comparisons, with a value of ξ^L close to zero preferred.

Educational performance assessment of countries

Throughout this section, an integrated approach based on the EDAS method is used to assess the educational performance of twenty EU member states for which complete data for the considered criteria could be obtained. The PISA 2018 database and the UNESCO Statistics Institute database are used to determine the performance values of countries with regard to specified criteria. Throughout the analysis, reading, mathematics and science PISA test scores, as well as the ratio of teachers to students, learning time of students (in minutes per week), and government expenditure on primary education as a percentage of GDP are considered as performance criteria. The government expenditure on primary education as a percentage of GDP in 2018 is derived from the UNESCO Institute for Statistics database (UNESCO, 2018), whereas the other indicators are obtained from the PISA 2018 database (OECD, 2018). As the government expenditure on primary education has already been used with PISA test scores for performance evaluation in the relevant literature, this criterion is selected in lieu of government expenditure on secondary education (Kocak et al., 2019). Furthermore, according to Gupta et al. (2002), the reason that governments attach more importance to the expenditure on basic education is based on the social rate of return, with previous research conducted for evaluating the effectiveness of government spending on education revealing that the social rate of return is highest for primary education, succeeded by secondary and tertiary education (Psacharopoulos, 1994). According to the PISA database, the learning time of students indicates the total amount of learning time of students in their schools.

Table 1 contains information pertinent to the education performance evaluation of 20 countries according to six criteria.

The weights of criteria are calculated using formulation (20), i.e. the linear form of BWM. Table 2 displays the best-to-others (BO) and other-to-worst (OW) vectors of BWM derived from field experts' evaluation, which indicate the preference of the best criterion over all others and the preference of all others over the worst criterion, respectively. According to the outcomes of BWM, the mathematics score is regarded as the best (i.e. most important) criterion, whereas the learning time is regarded as the worst (i.e. least important) criterion. The linear form of BWM has a consistency indicator, ξ^L , of 0.071, which can be considered as acceptable. Table 3 displays the weights of criteria computed using the linear form of BWM.

Table 1

EU countries	reading score	math score	science score	teachers/ students ratio	learning time	government expenditure (%)
Austria	484.393	498.942	489.780	0.092	1730	0.893
Belgium	492.864	508.070	498.773	0.108	1669	1.524
Czechia	490.219	499.468	496.791	0.077	1536	0.845
Denmark	501.130	509.398	492.637	0.074	1655	1.632
Estonia	523.017	523.415	530.108	0.081	1563	1.470
Finland	520.079	507.301	521.885	0.092	1479	1.349
France	492.606	495.408	492.977	0.086	1646	1.160
Greece	457.414	451.370	451.633	0.105	1662	1.253
Hungary	475.987	481.083	480.912	0.094	1586	0.640
Ireland	518.078	499.633	496.114	0.078	1730	1.159
Italy	476.285	486.590	468.012	0.107	1742	0.957
Latvia	478.699	496.126	487.251	0.091	1556	1.281
Lithuania	475.873	481.191	482.067	0.095	1510	0.718
Luxembourg	469.985	483.421	476.769	0.107	1646	1.083
Netherlands	484.784	519.231	503.384	0.057	1632	1.156
Poland	511.856	515.648	511.036	0.124	1697	1.455
Portugal	491.801	492.487	491.677	0.096	1759	1.399
Slovakia	457.984	486.165	464.048	0.078	1517	0.907
Slovenia	495.346	508.898	507.007	0.113	1686	1.428
Sweden	505.785	502.388	499,445	0.084	1631	1.925

Data concerning the educational performance assessment of EU countries

Source: PISA 2018 Database, OECD, 2018, Retrieved June 4, 2023, from https://pisadataexplorer.oecd.org/ide/idepisa/dataset.aspx; UNESCO Institute for Statistics 2018 Database, UNESCO, 2018, Retrieved June 4, 2023, from http://data.uis.unesco.org.

Table 2

Best-to-Others and Others-to-Worst pairwise comparison vectors

Criteria	Best-to-Others (BO)	Others-to-Worst (OW)
reading score	2	6
maths score	1	7
science score	4	4
teachers/students ratio	5	3
learning time	7	1
government expenditure on primary education as a percentage of GDP	3	5

Source: authors' own work.

The EDAS method with BWM criteria weights is implemented to perform the educational performance evaluation of twenty EU member states using the data provided in Table 1. Table 4 displays the normalised weighted sum of the positive distance from the average solution (NSP_i), the normalised weighted sum of the negative distance from the average solution (NSN_i), the appraisal score (AS_i), and the position of each country in the overall ranking.

As shown in Table 4, the best-performing country regarding educational performance was determined as Sweden, succeeded by Poland, Belgium, Slovenia

Table 4

Results obtained using the proposed integrated approach

EU countries	NSP _i	NSN _i	AS _i	Rank
Sweden	1	0.916603	0.958301	1
Poland	0.904338	1	0.952169	2
Belgium	0.652338	1	0.826169	3
Slovenia	0.632778	1	0.816389	4
Estonia	0.748533	0.864843	0.806688	5
Denmark	0.663988	0.807466	0.735727	6
Finland	0.448235	0.955839	0.702037	7
Portugal	0.312764	0.959537	0.636151	8
Latvia	0.084986	0.892262	0.488624	9
Ireland	0.179638	0.785775	0.482706	10
France	0.016706	0.856482	0.436594	11
Netherlands	0.191250	0.538460	0.364855	12
Luxembourg	0.146486	0.578550	0.362518	13
Italy	0.178218	0.447999	0.313108	14
Austria	0.038674	0.541853	0.290264	15
Greece	0.185217	0.364732	0.274974	16
Czechia	0.026922	0.325712	0.176317	17
Lithuania	0.032159	0.084428	0.058293	18
Slovakia	0	0.095293	0.047646	19
Hungary	0.020053	0	0.010026	20

Source: authors' own work.

Table 3 Weights of criteria resulting from BWM

Criteria	Weights
maths score	0.379022
reading score	0.224769
government expenditure on primary education as a percentage of GDP	0.149846
science score	0.112384
teachers/students ratio	0.089907
learning time	0.044072

Source: authors' own work.

and Estonia. Furthermore, it is worth noting that the complete ranking order of the countries is achieved using the proposed approach.

Discussion

In order to examine the robustness of the proposed framework, other well-known distance-based MCDM methods, namely TOPSIS, VIKOR and CODAS (COmbinative Distance-based ASsessment) are implemented to assess the education performance of nations using the dataset provided in Table 1, and are based on find-

> ing a compromise solution for the decision-making problem. The basic principle for the compromise solution, which can be defined as a feasible solution closest to the ideal. was introduced by Yu (1973) and Zeleny (1982). TOPSIS and VIKOR are based on aggregate functions representing "closeness to ideal", while CODAS evaluates the alternatives using the distance to the antiideal solution, and the EDAS method used in this study focuses on calculating positive and negative distances from the average solution. The EDAS method therefore enables a more practical analysis, as it does not demand determining the ideal and/or anti-ideal solutions as reference points.

> The fundamental notion of the TOPSIS method is that the selected alternative ought to have the "shortest distance" to the ideal solution and the "farthest distance" to the antiideal solution (Hwang & Yoon, 1981). The TOPSIS method sets forth two "reference points",

although not considering the relative importance of distances from these points.

The VIKOR method introduces a ranking metric based on the degree of closeness to the ideal solution (Opricovic, 1998), which aggregates all criteria, their relative importance, and the balance between overall and individual satisfaction (Opricovic & Tzeng, 2004). In this ranking metric, v signifies the weight of the strategy of "the majority of criteria", and v is assumed to be 0.5 as in numerous other studies.

In the CODAS method, the alternatives are evaluated according to the distance to the anti-ideal solution, which is defined as the combination of the Euclidean distance and the Taxicab distance (Keshavarz-Ghorabaee et al., 2016), and the best alternative is identified as the one having the farthest distance to the anti-ideal solution. The same set of criteria weights obtained from BWM is used for the implementation of other distance-based MCDM methods. The ranking results obtained from TOPSIS, VIKOR and CODAS with the BWM weights are presented in Table 5, while Figure 1 displays a comparative analysis of the results by showing the rankings of countries according to the considered distance-based MCDM methods.

The Spearman rank correlation coefficients between the rankings of these distance-based MCDM methods are calculated and presented in Table 6.

The Spearman rank correlations indicate that the similarities between the rankings obtained from these approaches are statistically significant (Ramsey, 1989). The ranking results illustrate that Sweden stands out

Table 5

Results obtained from TOPSIS, VIKOR and CODAS

EU countries	TOPSIS	VIKOR	CODAS
Austria	16	10	16
Belgium	2	7	4
Czechia	17	13	17
Denmark	4	4	6
Estonia	6	1	3
Finland	8	3	7
France	12	12	12
Greece	10	20	14
Hungary	20	18	19
Ireland	11	8	10
Italy	15	15	15
Latvia	9	14	9
Lithuania	19	17	18
Luxembourg	14	16	13
Netherlands	13	9	11
Poland	3	2	2
Portugal	7	11	8
Slovakia	18	19	20
Slovenia	5	5	5
Sweden	1	6	1

Source: authors' own work.

Figure 1

Comparative analysis of the rankings of countries



Source: authors' own work.

Table 6

Spearman rank correlation matrix for the rankings obtained from distance-based MCDM methods

	EDAS	TOPSIS	VIKOR	CODAS
EDAS	1	0.9594	0.8511	0.9880
TOPSIS		1	0.7504	0.9639
VIKOR			1	0.8496
CODAS			-	1

Source: authors' own work.

as the best-performing country using EDAS, TOPSIS and CODAS, while Poland is ranked second in terms of education performance using EDAS, VIKOR and CODAS.

Summary and concluding remarks

This research proposes an integrated decision framework using the EDAS method with weights obtained from BWM to assess the educational performance of EU nations. The EDAS method depends on the computation of the positive distance and the negative distance from the average solution, where greater values of the positive distance from the average solution and/or smaller values of the negative distance from the average solution indicate that the alternative solution is superior to the average solution. While other wellknown distance-based MCDM methods compare the alternatives with regard to ideal and anti-ideal solutions, the EDAS method does not require identifying ideal and/or anti-ideal solutions as reference points, and thus provides a more practical analysis.

BWM is a min-max mathematical programming model that sets the preference of the best criterion over all other criteria, as well as the preference of all criteria over the worst criterion. Taking into account the benefits of BWM, namely demanding fewer pairwise comparisons and producing relatively more consistent outcomes, the linear form of BWM is used to compute the weights of criteria, which are subsequently incorporated into EDAS.

A case study assessing the educational performance is conducted by analysing 20 EU countries considering six attributes denoted as reading, mathematics and science PISA test scores, the ratio of teachers to students, the learning time of students, and government expenditure on primary education as a percentage of GDP. In MCDM terminology, an attribute or performance criterion should provide a means of evaluating the levels of an objective (Hwang & Yoon, 1981). This study does therefore not categorise the considered attributes as policy and outcome, but, in accordance with MCDM terminology, these factors are used as a means to assess the educational performance of countries through a robust decision-making framework. According to expert judgements for determining the BWM weights, the mathematics score is revealed as the most important attribute, whilst learning time is revealed as the least important.

Using the proposed integrated BWM&EDAS approach, Sweden is identified as the country with the highest education performance followed by Poland, Belgium, Slovenia and Estonia. The TOPSIS, VIKOR and CODAS methods are applied to the same dataset using the BWM weights. The results illustrate that similarities between the rankings obtained from the proposed approach and other widely used distancebased MCDM methods are statistically significant, and thus the proposed integrated decision approach can be considered as a reference decision aid in education policy assessment.

It is worth noting that the outcomes of the analyses may differ if other criteria based on alternative data sources are taken into consideration. Future research could focus on extending this study by considering attributes possessing qualitative data to incorporate imprecision into the education performance assessment. Moreover, EDAS can be combined with other weighting approaches as future research work.

Notes

This manuscript is an extended version of the authors' paper presented at the International Academic Conference on Management, Economics and Marketing in Vienna, Austria on 7 July 7 2023, for which "e-mentor" was a supporting journal.

References

Amavilah, V. H., & Rodríguez Andrés, A. (2022). Knowledge economy and the economic performance of African Countries: A seemingly unrelated and recursive approach. *Journal of the Knowledge Economy*, *15*, 110–143. https://doi. org/10.1007/s13132-022-01033-7

Aparicio, J., Cordero, J. M., Gonzalez, M., & Lopez--Espin, J. J. (2018). Using non-radial DEA to assess school efficiency in a cross-country perspective: An empirical analysis of OECD countries. *Omega*, 79, 9–20. https://doi. org/10.1016/j.omega.2017.07.004

Aparicio, J., Perelman, S., & Santín, D. (2022). Comparing the evolution of productivity and performance gaps in education systems through DEA: an application to Latin American countries. *Operational Research*, *22*, 1443–1477. https://doi.org/10.1007/s12351-020-00578-2

Gebre, S. L., Cattrysse, D., & Van Orshoven, J. (2021). Multi-criteria decision-making methods to address water allocation problems: A systematic review. *Water*, *13*(2), 125. https://doi.org/10.3390/w13020125

Ginevicius, R. (2011). A new determining method for the criteria weights in multicriteria evaluation. *International Journal of Information Technology & Decision Making*, 10(6), 1067–1095. https://doi.org/10.1142/ S0219622011004713

Gupta, S., Verhoeven, M., & Tiongson, E. R. (2002). The effectiveness of government spending on education and health care in developing and transition economies. *European Journal of Political Economy*, *18*(4), 717–737. https://doi.org/10.1016/S0176-2680(02)00116-7

Hanushek, E. A., & Woessmann, L. (2020). A quantitative look at the economic impact of the European Union's educational goals. *Education Economics*, *28*(3), 225–244. https://doi.org/10.1080/09645292.2020.1719980

Hwang, C. L., & Lin, M. I. (1987). Group decision making under multiple criteria: Methods and applications. Springer--Verlag.

Hwang, C. L., & Yoon, K. (1981). Multiple attribute decision making. Methods and applications: a state-of-the-art survey. Springer-Verlag.

Ishizaka, A., & Resce, G. (2021). Best-Worst PRO-METHEE method for evaluating school performance in the OECD's PISA project. Socio-Economic Planning Sciences, 73, 100799. https://doi.org/10.1016/j.seps.2020.100799

Keshavarz-Ghorabaee, M., Zavadskas, E. K., Olfat, L., & Turskis, Z. (2015). Multi-criteria inventory classification using a new method of Evaluation Based on Distance from Average Solution (EDAS). Informatica, 26(3), 435-451. https://doi.org/10.15388/Informatica.2015.57

Keshavarz-Ghorabaee, M., Zavadskas, E. K., Turskis, Z., & Antucheviciene, J. (2016). A new combinative distancebased assessment (CODAS) method for multi-criteria decision-making. Economic Computation & Economic Cybernetics Studies & Research, 50(3), 25–44.

Keršuliene, V., Zavadskas, E. K., & Turskis, Z. (2010). Selection of rational dispute resolution method by applying new step-wise weight assessment ratio analysis (SWARA). Journal of Business Economics and Management, 11(2), 243–258. https://doi.org/10.3846/jbem.2010.12

Kocak, D., Ture, H., & Atan, M. (2019). Efficiency measurement with network DEA: an application to sustainable development goals 4. International Journal of Assessment Tools in Education, 6(3), 415-435. https://doi. org/10.21449/ijate.539487

Lewis, S., & Lingard, B. (2022). Platforms, profits and PISA for schools: new actors, by-passes and topological spaces in global educational governance. Comparative Education, 59(1), 99-117. https://doi.org/10.1080/03050 068.2022.2145006

10

OECD. (2018). PISA 2018 Database. Retrieved June 4. 2023, from https://pisadataexplorer.oecd.org/ide/idepisa/ dataset.aspx

.

.

OECD. (2019). PISA 2018 Results (Volume I): What students know and can do. OECD Publishing. https://doi. org/10.1787/5f07c754-en

Opricovic, S. (1998). Multicriteria optimization of civil engineering systems. Faculty of Civil Engineering, 2(1), 5-21.

Opricovic, S., & Tzeng, G. H. (2004). Compromise solution by MCDM methods: A comparative analysis of VIKOR and TOPSIS. European Journal of Operational Research, 156(2), 445-455. https://doi.org/10.1016/S0377-2217(03)00020-1

Pekelman, D., & Sen, S. K. (1974). Mathematical Programming Models for the Determination of Attribute Weights. Management Science, 20(8), 1217–1229. https:// www.jstor.org/stable/2629998

Psacharopoulos, G. (1994). Returns to investment in education: A global update. World Development, 22(9), 1325-1343. https://doi.org/10.1016/0305-750X(94)90007-8

Ramsey, P. (1989). Critical Values for Spearman's Rank Order Correlation. Journal of Educational Statistics, 14(3), 245-253. https://doi.org/10.3102/10769986014003245

Rezaei, J. (2015). Best-worst multi-criteria decision-making method. Omega, 53, 49-57. https://doi. org/10.1016/j.omega.2014.11.009

Rezaei, J. (2016). Best-worst multi-criteria decision-making method: Some properties and a linear model. Omega, 64, 126-130. https://doi.org/10.1016/ j.omega.2015.12.001

Saaty, T. L. (1977). A scaling method for priorities in hierarchical structures. Journal of Mathematical Psychology, 15(3), 234-281. https://doi.org/10.1016/0022-2496(77)90033-5

The full list of references is available in the online version of the journal.

. E. Ertugrul Karsak is a Professor of Industrial Engineering at Galatasaray University, Türkiye. He also served as founding co-chairholder between 1997 and 2015, and then Chairholder from 2015 to 2024 of the UNESCO Chair in Computer-Integrated Manufacturing established at Galatasaray University. He holds BS and PhD degrees in Industrial Engineering from Istanbul Technical University, and an MS degree in Industrial and Systems Engineering from the University of Southern California. He is a Chartered Financial Analyst (CFA). His areas of interest include decision analysis, performance management, capital investment decision making, circular economy and product development. Dr. Karsak is the author of numerous technical papers that have appeared in academic journals including the International Journal of Production Research, International Journal of Production Economics, Production Planning & Control, Expert Systems with Applications, Applied Mathematical Modelling, Computers & Industrial Engineering, Socio-Economic Planning Sciences, Resources, Conservation and Recycling, Social Indicators Research, International Journal of Advanced Manufacturing Technology, International Journal of Computer Integrated Manufacturing, Journal of Systems and Software, Applied Soft Computing, International Journal of Systems Science, Software Quality Journal, and Kybernetes. He has contributed to numerous international conferences as a keynote speaker, presenter, track chair and workshop organiser. According to a database compiled by Stanford University and Elsevier in 2024, as well as previous versions created since 2019, he is ranked among the world's top scientists both for career-long and single recent year impact in his respective field.

. Ece Ucar is a PhD candidate in Industrial Engineering at Galatasaray University. She holds BS and MS degrees in Industrial Engineering from Galatasaray University, and an MS degree in Industrial Innovation from Grenoble Polytechnic Institute. Her research interests focus on Data Envelopment Analysis (DEA)-based approaches, efficiency analysis and multi-criteria decision-making applications for educational performance assessment. Currently, she is working on her PhD thesis, which focuses on network DEA approaches and their applications in education, finance and health.



Hsin-Yi Lien



Hsieh-Chih Lai

The impact of the organisational commitment of teachers on work engagement: The mediating role of teaching efficacy

Abstract

Research on teaching efficacy has explored the impact of self-efficacy on students' academic performance and learning engagement, but little attention has been paid to the correlation with organisational commitment and work engagement. This study looks into the relationship between organisational commitment and work engagement, focusing on the mediation of self-perceived teaching efficacy. A cross-sectional study was designed, in which 1,532 teachers from 722 junior high schools in Taiwan completed distributed questionnaires containing an organisational commitment scale, teacher self-efficacy scale, and work engagement scale. Structural equation modelling was used to analyse the collected data, and confirmatory factor analysis and bootstrapping were used to confirm the hypothesised model. The outcomes revealed strong positive correlations among the self-efficacy, organisational commitment and work engagement of teachers, with organisational commitment and work engagement, indirectly impacting work engagement through teaching efficacy. The results confirmed the mediating role of teaching efficacy.

Keywords: teaching efficacy, organisational commitment, work engagement, secondary school teachers, teacher behaviour

Introduction

Shifting from 9-year compulsory education to 12-year basic education, Taiwan launched a new educational curriculum in 2019 to meet the changing needs of society. The educational reform has considerably increased the workload of secondary school teachers, mainly due to curriculum changes (Hung, 2017) that affect lesson design, learning assessments, and teaching effectiveness (Ting et al., 2023). The implementation of education reform may reduce teachers' engagement, and even their commitment to their schools, as teacher effectiveness is key to both teachers' working conditions and students' learning performance, so teachers with high self-efficacy tend to devote themselves more to school and student matters. However, research has shown that secondary school teachers in Asia have low professional commitment and less access to supportive workplace resources, which in turn affects their work engagement (Cai et al., 2022; Granziera & Perera, 2019).

Existing studies on teacher effectiveness have explored the impact of self-efficacy on students' academic performance and learning engagement (Shahzad & Naureen, 2017), as well as the correlation of teacher self-efficacy with teacher work engagement (Wang & Pan, 2023; Zhi et al., 2023). The more confidence teachers have in their teaching, the better their students' academic performance in class and the more engaged teachers are in the life of the school. Whether professional efficacy is regarded as a consequence of engagement or a constituting element, it is clear that engaged workers feel more productive in their work (Maslach & Leiter, 1997). Low work engagement can be an indicator of a lack of professional efficacy (Schaufeli et al., 2006), and work engagement

Hsin-Yi Lien, Ming Chuan University, Taiwan, D https://orcid.org/0000-0003-2534-0792

Hsieh-Chih Lai, National Academy for Educational Research & Ming Chuan University, Taiwan, D https://orcid.org/0009-0008-1014-1604

can positively predict self-efficacy (Li et al., 2022). Furthermore, Orgambídez et al. (2019) indicated that self-efficacy and work engagement could predict affective organisational commitment, with self-efficacy playing a further mediating role between affective organisational commitment and work engagement.

Waweru et al. (2021) pointed out that in Kenya, secondary school teachers with higher self-efficacy are committed more to their schools, while Demir (2020) revealed that in Turkey, more effective teachers have better organisational commitment and job involvement, and that organisational commitment and motivation mediate the relationship between teacher self-efficacy and job involvement. In Ouargla-Algeria, Mouloud and Krine (2021) found evidence that the organisational commitment of physical education teachers can predict their self-efficacy. Liu and Huang (2019), on the other hand, found that the occupational self-efficacy of part-time MBA students in China could predict work engagement, and that organisational commitment was a mediator between self-efficacy and work engagement, although it remained unclear whether teacher self-efficacy played a mediating role in the relationship between organisational commitment and work engagement.

A limited number of studies have discussed the impact of organisational commitment on teachers' work engagement in the Asian context, especially in secondary schools. This study aims to fill the gap by verifying the predictive role of self-efficacy and organisational commitment on work engagement, and by examining the mediating role of self-efficacy in the relationship between organisational commitment and work engagement.

Organisational commitment and work engagement

Past studies on teachers tend to explore the relationship between organisational commitment and work engagement, and while perspectives vary, higher engagement or commitment is effective for organisations. Organisational commitment and work engagement enhance the organisational identification and job performance of faculty members in universities (Nabhan & Munajat, 2023) and strengthen the job satisfaction of clinical nurses (Lee & Yu, 2023). Some studies have regarded organisational commitment as the cause of work engagement (Rivkin et al., 2016; Sezen-Gultekin et al., 2021), while others have indicated that work engagement results in organisational commitment (Orgambídez et al., 2019). Sezen--Gultekin et al. (2021) suggested that the organisational commitment of Turkish teachers could predict their work engagement, although Orgambídez et al. (2019) found that the work engagement of Spanish nurses could predict affective organisational commitment. Abdulaziz et al. (2022) found evidence that teachers' work engagement partially mediated the relationship between work-life balance and organisational commitment in Saudi Arabia. Raj et al. (2024) indicated

that faculty engagement mediates the relationship between quality of work life and organisational commitment among Indian teachers.

.

Whether teachers who are more engaged in their work have a higher level of commitment to their schools, or whether teachers with higher organisational commitment engage more in their work, remains unclear. Teachers with better organisational commitment are willing to devote themselves to working consistently, fully concentrating on their tasks, and experiencing significance, enthusiasm, inspiration, pride and challenges in their work. Work engagement relates to having a positive frame of mind at work, as well as a sense of fulfilment, and, as such, it is a more persistent and pervasive affective-cognitive status, while commitment is more psychological. The latter is a powerful belief in the school, and the components of affective, continuance, and normative commitment (Allen & Meyer, 1990) could be psychological factors affecting teachers in their connection with school activities. Thus, this study examines whether teachers' organisational commitment predicts work engagement, with the following hypotheses proposed in this paper:

H1: Teachers' organisational commitment and self-efficacy positively predict work engagement.

The mediating role of teaching efficacy

Teacher self-efficacy is teachers' confidence in and expectations of their ability to successfully complete teaching tasks (Bandura, 1977), and can also be regarded as their ability to achieve the desired outcomes in student engagement and academic achievement (Tschannen-Moran & Woolfolk Hoy, 2001). There is a significant correlation between teachers' sense of efficacy and organisational commitment (Agu, 2015; Coladarci, 1992; Waweru et al., 2021), with work engagement shown to predict self-efficacy (Li et al., 2022). In China, teaching efficacy (Wang & Pan, 2023) and well-being (Kong, 2021) predicted work engagement, although the paths among teachers' organisational commitment, work engagement, and self-efficacy need to be further elucidated. It remains to be confirmed whether work engagement and organisational commitment lead to self-efficacy, or whether self-efficacy results in work engagement and organisational commitment.

Liu and Huang (2019) found that the organisational commitment of Chinese students enrolled part-time in a Master of Business Administration (MBA) degree mediated the relationship between self-efficacy; further, the work engagement and occupational self-efficacy of these students predicted work engagement. Orgambídez et al. (2019) indicated that the self-efficacy and work engagement of nursing staff positively predicted affective organisational commitment, and that work engagement played a mediating role between self-efficacy (personal resource) and affective organisational commitment (organisational result), suggesting that there is a significant correlation between teachers' sense of efficacy and organisational commitment (Coladarci, 1992; Waweru et al., 2021). Over the past two decades, psychological well-being has been shown to influence teachers' organisational commitment (Aiello & Tesi, 2017). Orgambídez et al. (2019) indicated that work engagement mediated self-efficacy and affective organisational commitment, and that affective organisational commitment positively predicted selfefficacy and work engagement. A greater perception of one's own abilities, as well as a higher level of work engagement, can strengthen the affective bond with the organisation. Self-efficacy plays a mediating role between professional job satisfaction and happiness at work, while organisational commitment has some impact on work engagement and teaching efficacy. Teachers with high self-efficacy are more committed to their institutions (Waweru et al., 2021). Research has found that teacher self-efficacy is associated with work engagement (Wang & Pan, 2023; Zhi et al., 2023) and organisational commitment (Mouloud & Krine, 2021), although the correlations among teachers' organisational commitment, self-efficacy, and work engagement remain questionable, especially for secondary school teachers who experienced the educational reform in Taiwan. This study thus seeks to verify the predictive power of self-efficacy and organisational commitment for work engagement within schools and the mediating role of self-efficacy on the relationship between organisational commitment and work engagement. Accordingly, we propose the following hypotheses:

- H2: Teacher self-efficacy, organisational commitment, and work engagement are correlated.
- H3: Teacher self-efficacy mediates the relationship between organisational commitment and work engagement.

Method

Design and participants

To accomplish our research purpose, a total of 1,700 teachers were randomly selected from 722 junior high schools in Taiwan, and were invited to complete a questionnaire. These teachers had undergone educational reform for five years. Informed consent was obtained from all participants, and the study was approved by the authors' Institutional Review Board. 1,532 questionnaires were returned, giving a response rate was 90.1%, with 562 males (36.7%) and 970 females (63.3%) in the sample.

Measures

We used the following instruments for the research: the Teacher Sense of Efficacy Scale (TSES) proposed by Tschannen-Moran and Woolfolk Hoy (2001), the Organisational Commitment Scale (OCS) developed by Allen and Meyer (1990), and the Utrecht Work Engagement Scale (UWES) by Schaufeli et al. (2006).

Teacher self-efficacy

.

Teacher self-efficacy was measured using the 12item TSES under three domains: efficacy regarding instructional strategies (IS), efficacy regarding classroom management (CM), and efficacy regarding student engagement (SE). The TSES is measured on a five-point *Likert* scale, ranging from (1) strongly disagree to (5) strongly agree. Both reliability ($\alpha = 0.903$) and construct validity ($\chi^2 = 259.265$; df = 51; $\chi^2/df = 5.084$; GFI = 0.965; CFI = 0.980; RMSEA = 0.052; SRMR = = 0.038) were confirmed.

Teachers' organisational commitment

Organisational commitment was measured using the OCS model on a five-point *Likert* scale, ranging from (1) strongly disagree to (5) strongly agree. The 24-item scale was divided into affective commitment (AC), normative commitment (NC), and continuance commitment (CC), with internal consistency represented by a Cronbach's α coefficient of 0.742. Construct validity was also confirmed: $\chi^2 = 2419.865$; df = 245; $\chi^2/df = 9.877$; GFI = 0.867; CFI = 0.786; RMSEA = 0.076; SRMR = 0.088.

Teachers' work engagement

Teachers' work engagement was assessed using the nine-item UWES-9, which was originally developed to measure burnout. The three factors of vigour (VI), dedication (DE) and absorption (AB) are scored on a five-point *Likert* scale, ranging from (1) strongly disagree to (5) strongly agree. Construct validity was confirmed: $\chi^2 = 237.671$; df = 24; $\chi^2/df = 9.903$; GFI = 0.965; CFI = 0.970; RMSEA = 0.076; SRMR = 0.040. With a Cronbach's α of 0.882, internal consistency was also confirmed.

Data analysis

The statistical software packages *SPSS 28* and *Amos 25* were used to obtain descriptive statistics, correlations and reliability coefficients, and the relationship between self-efficacy, organisational commitment and work engagement was examined using structural equation modelling (SEM). Following verification of the scales, mediation analysis was used for testing path directions (Hayes, 2013), bootstrapping was used to make inferences, and confidence intervals (CIs) were used to measure the direct and indirect effects (Kline, 2016). We calculated bias-corrected (BC) bootstrap confidence intervals of 95% based on 10,000 samples (Hayes, 2013).

Results

Descriptive analysis and correlations

The final sample consisted of 1,532 participants, representing a response rate of 90.1%. The descriptive statistics and correlation coefficients are presented in Table 1. The results of correlational analyses revealed that teacher self-efficacy was positively associated with

Table 1

Descriptive statistics and factor correlations (N = 1,532)

Variables	Mean	SD	1	2	3
1. Organisational commitment	3.15	0.34	1.00		
2. Self-efficacy	3.82	0.44	0.155***	1.00	
3. Work engagement	3.51	0.58	0.399***	0.578***	1.00

Note. *** p < 0.001.

Source: authors' own work.

work engagement (r = 0.578, p < 0.001) and with organisational commitment (r = 0.155, p < 0.001). Organisational commitment and work engagement were also positively correlated (r = 0.399, p < 0.001). SEM was used to examine the correlations among teacher efficacy, work engagement and organisational commitment. The model fit was confirmed by the following measures: $\chi^2 = 351.523$; df = 32; $\chi^2 / df = 10.985$; CFI = 0.944; RMSEA = 0.081; SRMR = 0.046; TLI = 0.921.

Direct and indirect associations

Teacher self-efficacy was significantly correlated with organisational commitment ($\beta = 0.480$, SE = 0.042, p < 0.001) and was positively correlated with work engagement ($\beta = 0.416$, SE = 0.038, p < 0.001). In turn, teachers' work engagement was significantly correlated with organisational commitment after controlling for teacher efficacy and other covariates ($\beta = 0.699$, SE = 0.058, p < 0.001).

Mediation analysis

Hypothesis 3 predicted that teacher self-efficacy mediates the relationship between organisational commitment and work engagement, with the SEM model created to examine this hypothesis showing an acceptable fit ($\chi^2 = 351.523$; df = 32; $\chi^2/df = 10.985$; CFI = 0.94 4; RMSEA = 0.081; SRMR = 0.046; TLI = 0.921). Additionally, the following relationships remained significant: organisational commitment–teaching efficacy ($\beta = 0.480$, p < 0.01), teaching

Table 2

Standardised	estimates	of	direct	and	indirect	effects

efficacy–work engagement ($\beta = 0.416$, p < 0.001), and organisational commitment–work engagement ($\beta = 0.699$, p < 0.001), which suggests that teacher self-efficacy mediates the relationship between organisational commitment and work engagement, and that this mediating effect is further moderated by teacher self-efficacy. Significant correlations among teacher efficacy, work engagement and organisational commitment were detected, and the discriminant validity of the three-factor model was also confirmed.

10 M

As Figure 1 shows, teaching efficacy significantly predicts work engagement ($\beta = 0.416$, p < 0.001), and it also significantly mediates the relationship between organisational commitment and work engagement (mediating effect_{TE} = 0.051, p < 0.05). Organisational commitment had a significant direct effect on work engagement ($\beta = 0.699$, p < 0.001).

Discussion

The current research aims to test a model of work engagement in which the predictive power of organisational commitment and teacher self-efficacy was explored among secondary teachers in Taiwan. Our findings suggest that both teacher self-efficacy and organisational commitment are correlated with and significantly predict work engagement, although they act through different mechanisms: self-efficacy has a direct effect, while organisational commitment has an indirect effect, and is entirely mediated by self-efficacy. Organisational commitment, on the other hand, has a positive effect on work engagement. This

Path		X ² (df)	X^2/df	RMSEA	SRMR	CFI	TLI
Endogenous variable	Exogenous variable	351.523(32)	10.985	0.081	0.046	0.944	0.921
Direct effects		В	SE	t	β		
TE ←	OC	0.574	0.042	13.704***	0.480		
WE ←	TE	0.569	0.038	14.788***	0.416		
WE ←	OC	1.142	0.058	19.743***	0.699		
Indirect							
WE ←	OC	0.327	0.034	0.269~0.397	0.237		

Source: authors' own work.

Figure 1

Final model of organisational commitment, self-efficacy and work engagement



Note. **** p < 0.001. *Source*: authors' own work.

paper contributes to the literature by confirming that organisational commitment is an antecedent of work engagement, and that higher levels of organisational commitment result in higher levels of work engagement. These findings support those of Sezen-Gultekin et al. (2021), who researched teachers in Turkey, and are also consistent with the results found by Liu and Huang (2019) and Cao et al. (2019). Thus, if schools strengthen their teachers' commitment, the work engagement of those teachers will be at a higher level, showing that fostering teachers' organisational commitment is key to engagement in school activities, and thus students' learning.

Consistent with prior research conducted with early childhood teachers (Lipscomb et al., 2022), secondary school teachers who reported more self-efficacy also exhibited greater engagement in their work, which extends previous research on elementary school and middle school teachers (Skaalvik & Skaalvik, 2014). The direct influence of teacher self-efficacy on work engagement was also previously reported (Al-Hamdan & Issa, 2022; Granziera & Perera, 2019; Orgambídez et al., 2019) as was the predictive power of teacher self-efficacy on work engagement (Wang & Pan, 2023; Zhi et al., 2024). Thus, teachers who complete teaching tasks with confidence will engage in teaching with dedication, vigour and absorption. Self-efficacy can be considered a personal resource that assists teachers in carrying out their work with enthusiasm.

Our results also indicate that teacher self-efficacy mediates the relationship between organisational commitment and work engagement, supporting Hypothesis 3, which differs from the results of previous studies. The organisational commitment of Chinese MBA students played a mediating role in the relationship between occupational self-efficacy and

work engagement (Liu & Huang, 2019), while the work engagement of Spanish nursing professionals mediated the relationship between self-efficacy and affective organisational commitment (Orgambídez et al., 2019). However, teacher self-efficacy is associated with organisational commitment (Seyhan, 2015) and work engagement (Al-Hamdan & Issa, 2022; Granziera & Perera, 2019), and even predicted work engagement (Cai et al., 2023; Wang & Pan, 2023; Zhi et al., 2024). Although no prior studies had investigated the mediating role of teacher self-efficacy between organisational commitment and work engagement, the findings in this study confirmed that organisational commitment interacts with self-efficacy with regard to work engagement. Thus, teacher self-efficacy could be an important factor in teachers' engagement in schools attempting to increase teacher commitment.

Conclusions

This study investigated a structural model of organisational commitment, work engagement and teacher self-efficacy, examining both direct and indirect associations. The results provide strong support for an indirect relationship between organisational commitment and work engagement, which is mediated by teacher self-efficacy. Schools should seek to strengthen teachers' organisational commitment in order to promote work engagement and improve both teaching quality and the happiness of teachers. Our results highlight the significance of personal beliefs of effectiveness, and enhancing teacher self-efficacy will thus likely increase their engagement in school activities, resulting in better student learning. In addition, teacher self-efficacy and organisational commitment predicted work engagement. Under the pressure of educational reform, teachers' commitment to their schools is particularly important for their involvement, with self-efficacy playing the role of a mediator.

Acknowledgments

The authors have disclosed receipt of the following financial support for their research, authorship, and/or publication of this article: This work was supported by the National Science and Technology Council (grant number 110-2410-H-656-008-SS2).

References

Abdulaziz, A., Bashir, M., & Alfalih, A. A. (2022). The impact of work-life balance and work overload on teacher's organizational commitment: do job engagement and perceived organizational support matter. *Education and Information Technologies, 27*, 9641–9663. https://doi.org/10.1007/s10639-022-11013-8

Aiello, A., & Tesi, A. (2017). Psychological well-being and work engagement among Italian social workers: examining the mediational role of job resources. *Social Work Research*, *41*(2), 73–84. https://doi.org/10.1093/swr/ svx005

Agu, O. L. (2015). Work engagement, organizational commitment, self-efficacy and organizational growth: A literature review. *Journal of Information and Knowledge Management*, 6(1), 14–29.

Al-Hamdan, Z. & Issa, H. B. (2022). The role of organizational support and self-efficacy on work engagement registered nurses in Jordan: A descriptive study. *Journal of Nursing Management*, *30*(7), 2154–2164. https://doi. org/10.1111/jonm.13456

Allen, N. J., & Meyer, J. P. (1990). The measurement and antecedents of affective, continuance and normative commitment to the organization. *Journal of Occupational Psychology*, 63(1), 1–18.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, *84*(2), 191–215. https://doi.org/10.1037/0033-295x.84.2.191

Cai, Y., Liu, P., Tang, R. & Bo, Y. (2023). Distributed leadership and teacher work engagement: The mediating role of teacher efficacy and the moderating role of interpersonal trust. *Asia Pacific Education Review, 24*, 383–397. https://doi.org/10.1007/s12564-022-09760-x

Cao, Y., Liu, J., Liu, K., Yang, M., & Liu, Y. (2019). The mediating role of organizational commitment between calling and work engagement of nurses: A cross-sectional study. *International Journal Nursing Sciences*, 6(3), 309–314. https://doi.org/10.1016/j.ijnss.2019.05.004

Coladarci, T. (1992). Teachers' sense of efficacy and commitment to teaching. *Journal of Experimental Education*, 60(4), 323–337. http://www.jstor.org/stable/20152340

Demir, S. (2020). The role of self-efficacy in job satisfaction, organizational commitment, motivation and job involvement. *Eurasian Journal of Educational Research*, 20(85), 205–224.

Granziera, H., & Perera, H. N. (2019). Relations among teachers' self-efficacy beliefs, engagement and work satisfaction: A social cognitive view. *Contemporary Educational Psychology*, *58*, 75–84. https://doi.org/10.1016/ j.cedpsych.2019.02.003

Hayes, A. F. (2013). *Introduction to mediation, moderation and conditional process analysis. A regression-based approach*. The Guilford Press. https://doi.org/10.1111/jedm.12050

Hung, C-Y. (2017). The battle hymn of the activist teacher: Taiwanese school teachers' resistance to curriculum changes. *Discourse: Studies in the Cultural Politics of Education*, 40(4), 573–586. https://doi.org/10.1080/01 596306.2017.1401589

Kline, R. B. (2016). *Principles and practice of structural equation modeling* (4th ed.). The Guilford Press.

Kong, X. (2021). Chinese English as a foreign language teachers' self-efficacy and psychological well-being as predictors of their work engagement. *Frontiers in Psychology*, *12*, 788756. https://doi.org/10.3389/ fpsyg.2021.788756

Lee, E. H., & Yu, H. J. (2023). Effects of perceived spiritual management, work engagement, and organizational commitment on job satisfaction among clinical nurses: the mediating role of perceived spiritual management. *BMC Nursing*, *22*(1), 462. https://doi.org/10.1186/s12912-023-01625-x

Li, R., Liu, H., Chen, Y., & Yao, M. (2022). Teacher engagement and self-efficacy: The medicating role of continuing professional development and moderating role of teaching experience. *Current Psychology*, *41*, 328–337. https://doi.org/10.1007/s12144-019-00575-5

Lipscomb, S. T., Chandler, K. D., Abshire, C., Jaramillo, J., & Kothari, B. (2022). Early childhood teachers' self-efficacy and professional support predict work engagement. *Early Childhood Education Journal*, *50*(4), 675–685. https://doi. org/10.1007/s10643-021-01182-5

Liu, E. & Huang, J. T. (2019). Occupational self-efficacy, organizational commitment and work engagement. *Social Behavior and Personality*, *47*(8). https://doi.org/10.2224/sbp.8046

Maslach, C. & Leiter, M. P. (1997). The truth about burnout: How organizations cause personal stress and what to do about it. Jossey-Bass.

Mouloud, K., & Krine, N. (2021). Self-efficacy of physical education teachers and its relationship to job performance and organizational commitment. *VIREF Revista De Educacion Fisica*, *10*(3), 78–86. https://revistas.udea.edu. co/index.php/viref/article/view/345220

Nabhan, F., & Munajat, M. (2023). The role of work engagement and organizational commitment in improving job performance. *Cogent Business & Management*, *10*(2). https://doi.org/10.1080/23311975.2023.2235819

Orgambídez, A., Borrego, Y., & Vázqiez-Aguado, O. (2019). Self-efficacy and organizational commitment among Spanish nurses: The role of work engagement. *International Nursing Review, 66*(3), 381–388. https://doi. org/10.1111/inr.12526

Raj, A. B., Subramani, A. K., & Jan, N. A. (2024). Faculty engagement, quality of work-life, organizational commitment and spiritual leadership- examining the mediation and moderation effects. *Industrial and Commercial Training*, *56*(1), 41–52. https://doi.org/10.1108/ ICT-03-2023-0018

Rivkin, W., Diestel, S., & Schmidt, K. H. (2016). Which daily experiences can foster wellbeing at work? A diary study on the interplay between flow experiences, affective commitment, and self-control demands. *Journal of Occupational Health Psychology*, 23(1), 99–111. https://doi.org/10.1037/ocp0000039

Schaufeli, W. B., Bakker, A. B., & Salanova, M. (2006). The measurement of work engagement with a short questionnaire: A cross-national study. *Educational and Psychological Measurement*, 66(4), 701–716. https://doi.org/10.1177/0013164405282471

Seyhan, H. G. (2015). Analysis on job satisfaction, self-efficacy perception, organizational commitment and work stress levels of chemistry teachers's with respect to diverse variables. *Turkish Journal of Education*, 4(2), 41–60.

Sezen-Gultekin, G., Bayrakci, M., & Limon, I. (2021). The medicating role of organizational commitment on the relationship between emotional labors and work engagement of teachers. *Frontiers in Psychology, 12.* https://doi.org/10.3389/fpsyg.2021.648404

Shahzad, K., & Naureen, S. (2017). Impact of teacher self-efficacy on secondary school students' academic achievement. *Journal of Education and Educational Development*, *4*(1), 48–72.

Skaalvik, E. M., & Skaalvik, S. (2014). Teacher self-efficacy and perceived autonomy: Relations with teacher engagement, job satisfaction, and emotional exhaustion. *Psychological Reports*, *114*(1), 68–77. https://doi. org/10.2466/14.02.PR0.114k14w0

Ting, Y. S., Yeh, Y. C., & Chiang, J. L. (2023). Stress among secondary school teachers under the standardbased educational reform: Development of inventories

.

and factors influencing stress change. *Journal of Research in Education Sciences*, 68(1), 229–262.

Tschannen-Moran, M., & Woolfolk Hoy, A. (2001). Teacher efficacy: Capturing an elusive construct. *Teaching and Teacher Education*, *17*, 783–805. https://doi.org/10.1016/S0742-051X(01)00036-1

Wang, Y., & Pan, Z. (2023). Modeling the effect of Chinese EFL teachers' self-efficacy and resilience on their work engagement: A structural equation modeling analysis. *Sage Open*, *13*(4). https://doi.org/10.1177/21582 440231214329

Waweru, N. M., Kihoro, J. M., & Gachunga, H. G. (2021). Does teachers' self-efficacy influence their organizational commitment? *Independent Journal of Management & Production*, *12*(5), 1537–1553. https://doi.org/10.14807/ijmp. v12i5.1357

Zhi, R., Wang, Y., & Derakhshan, A. (2024). On the role of academic buoyancy and self-efficacy in predicting teachers' work engagement: A case of Chinese English as a foreign language teachers. *Perceptual and Motor Skill*, *131*(2), 612–629. https://doi.org/10.1177/0031512 5231222398

Hsin-Yi Lien is an associate professor at the Graduate School of Education, Ming Chuan University, Taiwan. Her research focuses on corpus linguistics, educational psychology and research methods in education.

Hsieh-Chih Lai is the corresponding author of this article. He is a research fellow of Educational Leadership at the Research Center for Education Systems and Policy, National Academy for Educational Research, and is an Adjunct Professor at the Graduate School of Education, Ming Chuan University, Taiwan. His research interests include educational leadership and policy, knowledge management and educational research, and special topics in education.

WE RECOMMEND

EDEN 2025 Annual Conference, 15–17 June 2025, Bologna, Italy



The EDEN Digital Learning Europe Annual Conference 2025 will focus on the future of education in the age of AI. The conference will explore the opportunities and challenges posed by generative AI, recognizing its potential for growth and innovation in education, while critically addressing the associated risks. It is important to recognize that different perspectives (educational, engineering, social, economic, psychological, etc.) are necessary to be taken into account to fully cover the impact of this technology for teaching, learning ad assessment, now and in the future. The conference will further present different scenarios of AI integration in education, ranging from personalized learning to global learning networks. The conference will reflect on how we can democratize access to knowledge, foster equity and inclusion, bridge gaps in education quality, cross boundaries, raise ethical awareness, combat biases and disinformation, promote global citizenship and sustainable development. The conference will also discuss the Bologna Process and its impact on shaping digital and AI-driven educational policies across Europe. A special focus of the conference will be on the role of AI in upskilling and reskilling for the future of work. Through these discussions, the EDEN Annual Conference 2025 aims to identify new directions for formal, informal, and non-formal education with, for and about AI, making critical mass around themes that matter to the future of learning, teaching, and societal well-being.

More information at: https://eden-europe.eu/event/eden-2025-annual-conference/



Paulina Chobot

Extracurricular student activity and its impact on developing students' job competencies. The case of students working at BEST Gdansk

Abstract

With practical abilities (mostly soft skills) currently gaining importance in professional endeavours, university students need to acquire and improve competencies expected by their potential, future employers, as they may not be able to fully develop them during traditional university courses. This study aims to determine whether the extracurricular activity of students influences the development of job competencies.

To test the hypothesis that such type of activity impacts the development of these competencies, an analysis of the basic framework of extracurricular activity was conducted, followed by a survey. As members of a student organisation operating by the Gdańsk University of Technology, the respondents were presented with a questionnaire and asked to assess the level of 12 chosen competencies before and while working at the organisation. The results showed that all participants experienced growth in their level of competencies, which illustrates that the extracurricular activity of students positively influences the development of job competencies.

Keywords: extracurricular student activity, student organization, competencies, development, professional endeavours, soft skills

Introduction

Nowadays, with practical skills becoming increasingly more important, especially as employers tend to expect some experience before offering a job, it is crucial to develop competencies whilst studying at university and at the same time gain knowledge beyond the theoretical spectrum usually taught during university courses. Some researchers believe this could be done through extracurricular activity (Montelongo, 2002; Rosch & Collins, 2017; Watson, 2011). Students willingly and enthusiastically join student organisations or associations for various reasons, which although it could indicate students' desire to socialise and meet new people, there might also be another underlying factor, such as students' aspiration to raise individual qualifications, including employability skills (Chapman et al., 2023).

Benefits of extracurricular student activity

Students' extracurricular activity is an essential tool when it comes to gaining practical competencies. Despite the wide range of possibilities for development that universities propose, it is often out of their reach to ensure training of all skills needed at work, due to the high specialisation of most companies. This is where extracurricular student activity becomes helpful, as it provides the chance for students' individual improvement according to their field of interest, but also enables hands-on experience needed in their future professional endeavours.

Students often have to balance studying at university with family commitments and working to cover tuition fees or living costs (King et al., 2020). Nonetheless, many undergraduates still seek extracurricular activities, especially during the second year of their studies, as this is considered to be the time to develop their employability portfolio

.
(De Sisto et al., 2021). However, it is worth mentioning that not all students engage in extracurricular activity only to raise their strictly work-connected abilities. Tinto's Student Integration Model, which tries to explain why students decide to leave university, could be helpful here, describing the conditions that need to be met to increase student retention. Despite the model's variables having a rather small impact on retention (Chrysikos, 2017), some authors claim that since each student's individual needs and expectations towards university differ, the model can still be useful in analysing this process. What is crucial here is that the model divides the university experience that students have into two categories: the academic and social system. Whilst the academic system is a predictable answer, not everyone considers the social system as a factor of student retention, with an important role played by extracurricular student activity. Its significance is often perceived as lower than it is in reality, while it may actually strengthen students' sense of belonging to the university (De Sisto et al., 2021).

Extracurricular student activity can also have a positive impact on students' success and academic performance (King et al., 2020), as it may help with satisfying psychological needs or dealing with stress thanks to interaction with peers, lecturers and other university staff (King et al., 2020). Emotional well-being positively influences proactive learning (Geertshuis, 2019), thereby contributing to better academic performance.

Participating in extracurricular activities raises students' cultural awareness as far as working with people from different backgrounds is considered. As Junfang Fu indicates, such activities are "effective ways to adjust to a brand-new culture or social environment and to develop necessary skills for future employment" (Fu, 2018, p. 96). The reason for this is not only due to direct contact with diverse individuals, but also thanks to extracurricular activity helping break through intrinsic barriers of a university (King et al., 2020). Such impediments can include prejudices connected to one's financial situation, family background, class and ethnic discrimination or a university's dominant culture¹. The latter conveys the superior position of teachers over students and, as Godor points out, "the requirement for students to pass certain examinations, in a certain way, using certain language in order to still be eligible for an academic degree" (Godor, 2017, p. 268), resulting in a student's feeling of being restrained.

A student's creative or mental block, possibly caused by the barriers mentioned above, may decrease a student's motivation and thereby lower self-efficacy, and there is a connotation between that and extracurricular activity. Apparently, students engaged

10

in such form of activity evince higher self-efficacy at university, compared to those who are not (Griffiths et al., 2021). However, it is worth mentioning that this self-efficacy may not only show itself in academic performance but also lead to self-confidence in daily life, as well as higher chances for finding employment, which refers to the concept of "whole person education" (Chan, 2016), which should be a desirable goal of every student.

Even though extracurricular activities can be perceived as an "unnecessary source of stress" for some students, due to the lack of time for choosing activities with direct benefit (Dickinson et al., 2021), which may not be clearly defined in terms of extracurricular activities, a lot of undergraduates continue to participate in order to gain experience and skills valuable to their potential, future employer.

Extracurricular activities may take a variety of different forms, with some events being organised by the university, although usually by students themselves, starting from less formal through traditional classes with the teacher, to working off-campus. Nonetheless, the best example of such activity could be a student organisation, which usually combines all the crucial aspects of extracurricular activity.

The international BEST as an example of a non-profit organisation

The abbreviation BEST stands for Board of European Students of Technology and is a student organisation taking the form of a non-profit organisation² and operating next to different Technological Universities across Europe. The concept was conceived in Stockholm in 1987, where a European conference for students of physics and mathematics was conducted (History, n.d.). The International Weeks that were established during the conference acted as an impulse for founding BEST, and its first official status was formed in April 1989 in Berlin (Fonseca, 2019). Its headquarters are currently in Brussels, but that does not mean it operates only in Belgium, and it is officially described as an international association (Statutes of the Board of European Students of Technology, 2021³).

The organisation is deeply structured and consists of an International Board, international departments, and subsidiaries, also called Local BEST Groups (LBG for short). Each LBG has its own status. After fulfilling the conditions to be a part of BEST as a whole, such as i.e. operating by a technological university in Europe, the joining group is first given the status of Observer, and with time, after meeting all the requirements, it can be promoted to a higher position, gaining at the same time new privileges. Each status can be acquired

¹ The concept described by B. P. Godor.

.

² BEST is officially described as a non-profit association, however its structure makes it closer to a non-profit organisation because of the defined roles and functions of its members. For this reason such naming was applied. ³ Internal document of the organisation, available only to registered members.

after engaging in making a contribution to or enhancing the reputation of BEST as a whole, i.e. by organising internal⁴ and external events (*Statutes of the Board of European Students of Technology*, 2021).

The organisation's regulations strictly formulate all the conditions that must be fulfilled to receive Full Member status, which allows it to have a bigger impact on the organisation's operations and new regulations. What is more, this scheme also translates into the internal structure of a particular LBG. After joining a local subsidiary of BEST, each new member also receives the status of Observer and can progressively become a Baby Member and eventually a Full Member. There is the possibility of being promoted to a higher status after proportionally bigger engagement and active participation in activities conducted by BEST. In this case, it gives the right to be a part of the board and to vote during each 6-month official meeting at the same time letting the members be a part of the decision-making process for the original LBG.

BEST currently operates in 32 countries, with 90 local groups and more than 3,300 volunteers (*BEST in Numbers*, n.d.). What brings all these people together are 5, officially formulated and coherent for every LBG, basic values, which are:

- flexibility,
- friendship,
- fun,
- improvement,
- learning.

All of these allow members to identify with the organisation along with its vision, which is "Empowered Diversity", and its mission, which is "Developing students" (*Identity of BEST*, n.d.).

BEST Gdansk and its characteristic

BEST Gdansk, or rather LBG Gdansk, is one of the subsidiaries of International BEST and operates by the Gdańsk University of Technology, providing additional chances for improvement to all students of this institution. Nevertheless, the biggest development op-

Figure 1



portunities would still be possible for the members of a student organization, as a lot of competencies could be gained while organising various events. The latter would not be possible without a strong people base, and LBG Gdansk, with 79 active members, definitely does not need to complain⁵.

In order to manage it well, members of LBG Gdansk are divided into 4 working groups, which are HR, PR, CR and LG/IT (Logistics and IT), and each group has a responsible member of the board. These groups are the core of the organisation and allow members to voluntarily develop in the area of their choice. After picking a group, the member may not change it during their participation in BEST, although this does not mean that their area of activity is final. One may choose a secondary group or even actively participate in the work of other groups without being a part of them, which allows for gaining competencies from different domains and can be beneficial during future employment, as it provides all-round development.

Methodology

Research sample

The research was conducted on students actively working in BEST Gdansk and those with alumni status. Although 38 members took part in the research, 5 participants had to be excluded from the sample as they had been active for only around one month when conducting the study, thus their period of working at the organisation was too short to show the development of any competencies. The analysed group therefore consisted of 33 respondents. As BEST Gdansk operates by the Gdańsk University Technology, all participants were students or graduates (in the case of alumni) of this university.

Among the participants of the research were 14 women and 19 men, with an age range from 19 to 37 years old (see: Figure 1), with most respondents aged 21 or 22 years old (27% and 21% of all participants, respectively).



Source: author's own work.

⁴ Internal to a specific LBG.

⁵ Data from an internal report of the board, presented on 8.01.2022.

The duration of activity in BEST is crucial to see the level of development, so a question to this regard was posed. As illustrated below (Figure 2) the biggest amount of participants, with a total of 10 (30%), have been working at the organisation for 1 to 1.5 years, 9 (27%) have been active for 6 months, 10 have been working for 2–3 years or more than 3 years (5 persons (15%) per category) and 4 respondents (12%) have alumni status (those 25–37 years old). Such time intervals were adopted due to the recruitment process to the organisation being organised twice a year: during spring (usually in late March) and autumn (usually in late October). There is no possibility to join between these two recruitment events, so there are no other periods of activity in the organisation.

Among the respondents, less than half were currently employed (45.5%), while the rest (54.5%) were only studying (Figure 3). Participants with professional experience were divided into 3 groups: studying and working, although not in the field of study (4 persons), studying and working in the field of study (6 persons), working and not studying (5 persons).

Almost all respondents (32) also named the university's faculty where they are studying or studied before, with the most often mentioned faculties being

the Faculty of Electronics, Telecommunications and Informatics (8 persons), the Faculty of Management and Economics (7 persons) and the Faculty of Electrical and Control Engineering (6 persons). There were fewer representatives of other faculties, such as Mechanical Engineering and Ship Technology (4 persons), Civil and Environmental Engineering (4 persons), Applied Physics and Mathematics (3 persons) and Architecture (1 person). None of those taking part in the research were students of the Faculty of Chemistry. As some participants may have been studying at more than one faculty, the total number of inserts is bigger than the number of valid answers in the survey.

Research methods

During research, respondents were presented with a questionnaire consisting of 22 different types of rooms, such as dichotomous and cafeteria questions, Stapel scales and open-ended questions. Qualitative and quantitative methods were applied.

The research could be roughly divided into two parts. Firstly, participants were asked to evaluate the level of their competencies before starting to work at BEST, and then during or after their activity, by assessing the degree to which these competencies

Figure 2

The duration of respondents' activity at BEST (by number of persons)



were developed, using Stapel scales⁶. These two periods were separated in the questionnaire, so the participants wouldn't be able to compare their answers and wouldn't modify their responses to show bigger growth than actually happened. The other part concerned the value (in the eyes of respondents) of the analysed competencies for employers.

Analysed competencies

Based on works from other authors and their research on which competencies are the most important for professional endeavours or landing a job, 12 job competencies were analysed. The list included the following competencies:

- communication,
- teamwork,
- interpersonal relations (empathy and social sensitivity),
- · leadership skills,
- self-confidence,
- time management/ self-organising and planning,
- problem-solving skills,
- analytical/logical thinking,
- creativity/creative thinking,
- responsibility,
- flexibility/adaptability,
- honesty.

Some may argue that leadership skills are rather not a competency and self-confidence, responsibility or honesty are more of character trait. Whereas this assumption might not be wrong, all of these are mentioned as valued competencies for some authors as it is i.e. for Robinson (2000) or Aasheim et al. (2009). In Aasheim et al. list of 10 top skills for IT managers, honesty is actually in first place. What is more, in the division of competencies by Cheetham and Chivers (1996, 1998), personal competency in fact takes into account behavioural competencies, which means that personal characteristics are also included, and which is why these notions were treated as competencies in this research.

Results

Evaluation of the level of competency development

The first analysed competency was communication, which overall mean of development before the activity at BEST was 3.4⁷. There was a 34% ⁸ growth to 4.5 thanks to working at the organisation, with a difference between male and female respondents also noted. Women have a higher level of communication, with a mode of 4 compared to 3 for men. However, men have a higher percentage growth of improvement than women considering the mean (a 46% and 22% increase respectively).

.

The next competency was teamwork. The result shows growth from an average 3.3 level to 4.5 thanks to being a member of BEST, with a difference observed between male and female participants. The first (male) group's assessment was 3.2 and 4.2, before and during activity. The latter (female) group's initial grade was 3.5, rising to 4.9. Nevertheless, it can be observed that the increase for both groups was quite similar, totalling 33% for men and 40% for women.

The third competencies on the list were those connected to interpersonal relations such as empathy and social sensitivity, with male respondents evaluating their level as 3.5 before and 4.2 while working at BEST. Similarly, the values for female participants were 4.1 and 4.5, and therefore their grades were higher than those of representatives of the opposite sex. However, their development growth was lower (9%) as it was up to 21% for males.

The following competency – leadership skills, showed the lowest value pre-development (among all the analysed competencies), especially for male participants – equal to 2.4, with the mean for all respondents at 2.6. Nevertheless, thanks to activity at BEST, it actually had one of the biggest increases, as it reached an average of 4 (to 4.4 for women and 3.8 for men), and thus grew by 48% for female and 60% for male participants. Moreover, for members that were active for 2–3 years, the value rose by 90% between these two periods. Nonetheless, despite this substantial growth, it still remains one of the two lowest-graded average levels of development during working at the organisation.

The other lowest evaluated competency was self-confidence. As in the case of leadership skills, it also rose to 4 during the activity, although it cannot be omitted that there was also quite a significant increase, by 49%, from the starting point of 2.7. The biggest growth happened to members working for 2–3 years and more than 3 years. The first ones experienced a 100% increase (from 2.2 to 4.4), and the latter group showed a 70% growth (from 2.5 to 4.25), which is much higher than the average increase, as it is lowered by persons active for 6 months or 1–1.5 years (42% and 36% growth, respectively). It should also be noted that no visible difference appeared in the assessment of male and female respondents for this competence.

The next analysed competency was time-management, which can be expressed in self-organising and planning. For this ability both female and male respondents achieved similar values while working at BEST, summing up to 4.2. As the initial grade was 2.6, participants experienced the biggest average growth in development of this competency, equal to 59%.

.

⁶ From 1 to 5, with 1 meaning "very poorly" and 5 meaning "very good".

⁷ The values were rounded up or down to one decimal point according to standard rules of rounding.

⁸ The percentage increase was calculated based on the unrounded respondents' assessment value.

Another crucial competency, in sources treated as the most desirable one for employers, are problem solving skills (NACE, 2024), with an average value of 3.3 before, rising to 4.5 during activity at the organisation. The participants experienced a 34% improvement, with no major difference between respondents of opposite sexes.

The following competency – analytical or logical thinking, actually had the highest value before working at BEST, totalling 4.1. What is more, for this competency alone, male respondents' evaluation before the activity was higher than that of female respondents (4.2 for men and 3.9 for women). Nevertheless, their results as members of the organisation are similar, with only a 0.04 difference (4.43 for females and 4.47 for males), giving an average of 4.45. As a consequence of such a high value before the activity, the overall increase was rather small, rounding up to 10%.

A competency where both the female and male participants' evaluation was almost the same was creativity or creative thinking. The overall mean was 3.7 before, with a 10% increase to 4.4 while working at BEST. Considering the duration of activity, the results vary. Even though the final grade is similar for members of all periods, the starting value differs, bringing various percentage increases. The most significant growth happened for respondents being active for more than 3 years (a 50% increase), although participants with alumni status or working at the organisation for 2–3 years also experienced a bigger than average boost (a 29% and 31% increase, respectively).

For some competencies, the differences between the answers of male and female respondents were quite substantial, and one of these was responsibility. The values before working at BEST were 3.5 for men and 4.2 for women, whereas while working at BEST female participants experienced a 10% increase to 4.6, but the final grade for male respondents was not much higher than the level of females before the activity, totalling 4.3. The overall mean for both sexes was 3.8 and 4.45 before and during working at BEST.

The next analysed set of competencies – flexibility and adaptability – saw a similar evaluation for both male and female participants, with similar values even considering the duration of working at BEST. The overall mean pre-development at the organisation was 3.4, rising to 4.5 during the activity, showing an increase of 32%.

The last evaluated competency was honesty, with a starting value of 3.9 for both men and women. The difference appeared in the assessment while working at the organisation. For female participants it grew to the level of 4.4, although for male respondents it increased by only 4%, giving a value of 4.1. Moreover, the average development increase for both sexes was the lowest among all analysed competencies, equal to only 8%.

The total average level of development of the evaluated competencies was equal to 3.4 before and 4.3 while working at BEST, with an overall percentage improvement of 29%. The average assessments for each of the analysed competencies can be seen in the table below (Table 1).

Table 1

Results of respondents' assessment of analysed competencies

	Ave	erage level of developm	ent
Competence	Before working at BEST	While working at BEST	% increase
Communication	3.4	4.5	34%
Teamwork	3.3	4.5	37%
Interpersonal relations (empathy and social sensitivity)	3.8	4.3	15%
Leadership skills	2.6	4	55%
Self-confidence	2.7	4	49%
Time-management / self-organising and planning	2.6	4.2	59%
Problem-solving skills	3.3	4.5	35%
Analytical / logical thinking	4.1	4.5	10%
Creativity / creative thinking	3.7	4.4	20%
Responsibility	3.8	4.5	18%
Flexibility/adaptability	3.4	4.5	32%
Honesty	3.9	4.2	8%
Mean for all competencies	3.4	4.3	29%

Source: author's own work.

Most valuable job competencies

As there were different assessments of the analysed competencies, with some being generally graded higher than others, the respondents were asked to determine which of these competencies are most valuable. However, before doing so, participants currently employed (15) were asked to choose 5 listed competencies that helped them in landing a job. Overall, the most often mentioned competency was communication, pointed out by 12 respondents (80%). Another 3, also named many times, were problem-solving skills (10), teamwork (9) and self-confidence (8), totalling a 66.7%, 60% and 53.3% share of all answers, respectively. For the fifth most often listed one, 3 competencies were actually tied, and were time-management (7), analytical or logical thinking (7), and responsibility (7). Honesty was mentioned the least, with only 2 participants pointing it out. There were no differences in the assessment depending on sex or the faculty the participants were studying in.

Apart from choosing which of the aforementioned competencies helped some of the respondents get a job, they were asked to determine, in accordance with their own opinion, which competencies are the most valuable for employers. Considering the results from the perspective of the participants' faculty, the assessment varies.

The first analysed group of respondents were studying at the faculty of Electronics, Telecommunications and Informatics, and for them (8 persons) the 2 most often mentioned competencies were communication (7) and teamwork (7). Moreover, for this group they were the most often listed competencies, achieving 87.5% of all answers of participants from this faculty. In second place were analytical thinking and problemsolving skills (5 respondents for both competencies). Other competencies worth mentioning here are flexibility, chosen by 4 participants, and also honesty, evaluated as not very valuable, and which was mentioned the most times for this group compared to respondents from other faculties, constituting 37.5% of this faculty students' answers (chosen by 3 persons).

For the faculty of Management and Economics, problem-solving skills came in first as the most mentioned ones by participants from this faculty (7 persons), chosen by 6 respondents (86% of this group's answers). For other listed competencies, the division of those that are valuable was rather clear, as the following 4 competencies were pointed to the same number of times (by 5 respondents), totalling 71% of this faculty participants' choices, including: communication, teamwork, flexibility/adaptability and time-management. Moreover, none of this group's respondents chose self-confidence as a valuable asset.

The next group from the faculty of Electrical and Control Engineering (6 persons) chose problem-solving skills (5), followed by teamwork (4) and time-management (4) as the most important competencies for employers. Responsibility, together with communication and flexibility, also scored quite high (mentioned by 3 persons each). What is worth mentioning here is that interpersonal relations were listed the most compared to the percentage share in other groups' answers, totalling 17%, although they were chosen by only one person.

For the faculty of Civil and Environmental Engineering, all respondents (4) listed communication as a valuable job competence, with teamwork and time-management mentioned by 3 participants. Other mentioned assets were analytical thinking (2), self-confidence (2) and leadership skills (2), with the last one only chosen by this group, as none of the respondents from different faculties treated this as important.

Members of BEST from the faculty of Mechanical Engineering and Ship Technology have similar assessments as those from the aforementioned faculty of Civil and Environmental Engineering. The only visible difference was that all participants (4) here chose flexibility as a valuable asset, and only half of them

Figure 4



Competencies that helped respondents get a job

Source: author's own work.

Respondents' assessment of most valuable competencies for employers



Source: author's own work.

treated communication (2) the same way. Time-management and teamwork were listed by 3 respondents and together with communication, analytical thinking, self-confidence and responsibility were mentioned by 2 persons from this group. For both this faculty and the previous one, honesty was not chosen by any of the members.

The answers from members of the Applied Physics and Mathematics or Architecture faculty were not analysed separately, as there were two few representatives of these faculties (2 and 1 respectively).

In the overall, cumulative analysis, teamwork was in first place as the most often mentioned valuable competency, listed by 24 respondents. Next came communication (23) and problem-solving skills (23), while 22 participants chose time-management, putting it in fourth place⁹. In last place among the 5 competencies listed, the most frequently mentioned were flexibility and adaptability, pointed out by 19 respondents. The division between these 5 important assets and other competencies was easily visible, since the remaining competencies were mentioned a lot less often (see Figure 5).

Other developed competences

E

Despite evaluating levels of development of competencies or assessing which are the most valuable for them, respondents were also asked to list what other competencies they acquired while working at BEST. Firstly, they named the hard skills they managed to develop, with 8 participants claiming that there was no improvement or acquirement of hard skills thanks to working at BEST, and the rest (25) finding that they

did enrich their sets of hard skills during this activity (Figure 6). The most often mentioned skill was graphic design, which was acquired by 19 respondents (76% of participants who developed some hard skills and 58% of all participants). Some learned how to edit photos (2) or make presentations¹⁰ (2), and 2 respondents also gained knowledge on how to run social media profiles, which is connected with graphic design or photo editing. They also improved their ability to use Microsoft Office, especially for professional purposes (2 persons). Among others, more formal acquired skills were proficiency in writing official letters or proposals (2), as well as correctly coding and writing e-mails (2) (using established subject labels, etc.). The rest of the respondents named other skills, although each was mentioned only once. Among hard skills, those worth specifying were improving their level of English, writing reports or offers for companies, working with a CRM system¹¹, accounting skills, or PR in the broad sense.

Despite hard skills, some respondents (14) also listed other competencies that they managed to develop while working at BEST. Among them were presentation skills, thus the ability to not only make an engaging presentation, but also to well present oneself, with 5 participants (15% of all respondents) improving their knowledge in this area, and negotiation skills also being mentioned in this context by 4 respondents. What is more, 2 participants even developed ways to deal with stress, connected to, for example, public speaking, thanks to working at the organisation. Other acquired competencies were named only once, by one respondent each, including:

⁹ Third place was omitted, as there were 2 competences ex aequo in second place.

¹⁰ Not how to present, but to make slides for presentations, i.e. in Canva.

¹¹ Customer Relationship Management System involving getting, analysing and then using the data about customers to better adjust the services (Yong Ahn et al., 2003).

Respondents' developed hard skills



Source: author's own work.

- knowledge about managing a team,
- ability to delegate tasks,
- knowledge about methods of creative and efficient work,
- emotional intelligence,
- being open to others,
- spontaneity,
- patience.

There were also some skills or competencies that some members of the organisation (10) wanted to develop, but haven't had a chance yet. The most often listed one was graphic design (5), and 2 respondents wanted to further improve their communication or leadership skills, as they felt that their growth was not sufficient so far. Some of the mentioned competencies were listed above, as ones that some of the participants have already developed, including running social media profiles, being open to others, and gaining knowledge about PR or negotiation skills.

The process of competency development at BEST

Respondents were asked to provide a few tips on how to better develop the competencies while working at the organisation. Some of them focus more on giving ideas on how to ameliorate the process of development as a whole, so rather giving new directions for the organisation, although the majority of participants listed ways to improve the level of competency development for individual participants. Nevertheless, the most often mentioned tip was to take part in training courses (12), both those already held by BEST and those yet to be organised. Another way to experience better growth of the competency level was to simply be open and willing to engage in different types of activity (mentioned by 9 persons), while 8 respondents even specified that it is crucial to be part of a core team, as it permits to acquire more specific skills. Connected to these 2 tips is another one listed by 5 participants – willingness to face new challenges, even if you do not feel ready for them. According to the respondents, it is the best way to leave one's comfort zone, and thus develop new competencies.

Since BEST is operating in different European countries, members also have a chance to engage in international events organised by the organisation, and 6 respondents think that it is of high importance in order to improve the level of their skills or learn new ones. The rest of the participants name 2 additional ways to ameliorate individual resources, by taking part in weekly meetings held at the organisation (2 persons) or running for a place on the organisation's board (1 person). The latter is supposedly the most developing, as it permits to have insides into all the projects organised by the LBG, therefore allowing to acquire specific skills connected to all of them.

Discussion

Having analysed all the gathered data, it is clear that working at a student organisation can develop competencies. It can be observed that all the respondents did improve the level of their competencies while working at BEST. For some participants, there may have been slight decreases. As one female respondent elaborates, her lower self-confidence level while working at the organisation than before was not a consequence of bad competency development, but appeared after realising how much there is yet to learn, which is not necessarily an unsatisfying answer in this context.

The variance in grades that respondents assign to certain skills, especially the differences between representatives of two sexes, might occur because of natural conditioning, making women usually keener (or socially persuaded) to focus rather on softer, interpersonal skills¹², such as empathy, social sensitivity,

.

¹² As described throughout centuries, starting from the *yin yang* division (women are soft, gentle, flexible) in *Yijing* (Nie, 2016).

communication or teamwork. This could also partially explain why men had higher scores prior to working at the organisation in analytical and logical thinking, as this competence is not in any way emotional. Moreover, this particular competence had the highest values before working at BEST, the reason for which possibly being the fact that all respondents are or were students of a technical university.

When considering the participants' assessment of their level of development, one could assume that permanent functions, such as being a member of the board or core team, that the respondents were performing had no impact on their evaluation values. However, this is not true. Even though the differences in grades between e.g. members with an HR or PR function cannot be observed, it does not mean that each function does not develop certain skills in particular. As one of the BEST values is flexibility, members may engage in performing tasks from various areas and take part in meetings of every working group¹³. There is also a lot of training from different areas available to all members, which could help in competency improvement, allowing respondents to experience all-round development, testified by the presented results. What is also worth mentioning here is participation in international events – there was no difference between respondents who took part in them and those who did not. Nevertheless, it does not necessarily mean that such events do not enhance the development of competencies, as participants who had an opportunity to engage in such activities might have shared gained knowledge, thus helping others to acquire these abilities.

Some competencies developed to a greater extent by respondents prescind from different grades depending on sex, with participants actually experiencing the smallest percentage growth for competencies that were mentioned the least as those valuable for employers. One of these was honesty, which came in 10th place out of 12 in the assessment of the most desirable job competencies, and was in fact the least developed while working at the organisation (an only 8% increase in grades). Other competencies include:

- interpersonal relations (a 15% increase and 12th place in the assessment),
- responsibility (an 18% increase and 7th place in the assessment),
- creative thinking (a 20% increase and 9th place in the assessment).

The only exception in this reasoning would be analytical and logical thinking, with only 10% growth in development thanks to working at BEST, although it still placed 6th in the respondents' ranking of the most valuable competencies for employers. Nonetheless, this may be the consequence of exceptionally high values even before working at BEST, thus leaving little space for improvement. Two other

rarely-mentioned skills were leadership skills (11th place) and self-confidence (8th place). Even though there was a substantial improvement (a 55% and 49% increase, respectively), their values while working at the organisation were still the lowest out of all competencies, so at the end they were still not as developed as other competencies that are treated as more important. Moreover, for the top 5 most often mentioned valuable assets (teamwork, communication, problem-solving skills, time-management and flexibility) respondents experienced the biggest percentage growth (expect for the aforementioned leadership skills and self-confidence). This could indicate that participants (maybe unconsciously) attach more importance to developing these 5 competencies, as they generally find them more desirable than others.

What could also be surprising is the fact that none of the participants who chose honesty (2) or interpersonal skills (4) as the ones that helped them in getting a job chose them as valuable in further assessment. This is rather an unexpected outcome and might be the reason for such low frequency of these 2 competencies' mentions in the evaluation of most desirable assets.

The differences in the respondents' assessment of the most valuable competencies for employers are definitely noticeable depending on the faculty participants were studying in, with the reason behind this potentially being different employer expectations subject to the various domains. For example, competencies demanded by the IT industry would probably differ from the required skills for a position in the environmental engineering industry.

Considering the research, there is one phenomenon that may be of concern, namely the low level of selfconfidence and leadership skills. Since the latter could be improved by providing proper training, self-confidence is more of a personal asset, connected rather to one's psychological state of mind, and thus harder to develop through working at the organisation. For this reason, the final grade of this competency should still be considered as satisfactory, thanks to the substantial improvement that occurred.

Considering competencies that respondents would like to develop in the future, it can easily be seen that all of the mentioned skills were already put on the list of the previously analysed 12 competencies, or were listed by some participants as additional ones that they managed to develop while working at BEST (like graphic design or negotiation skills). This shows that all of the respondents' desirable assets could be acquired whilst working at the organisation. Members that mentioned these probably didn't yet have a chance to perform a function or take part in training regarding learning this set of skills, although they might do so in future, whenever there is an opportunity.

.

¹³ The 4 working groups are HR, CR, PR and LG/IT.

Conclusions

Results show substantial growth in the level of development of all the analysed competencies thanks to working at BEST, equal to a 29% average increase. Considering the rather short period of activity of most respondents (6 months or 1–1.5 years), the outcome is definitely satisfactory and can be treated as an indicator that developing or acquiring new skills is efficient at BEST. What could also be observed is a connotation (without 3 analysed exceptions) between the value for employers that respondents attach to the competency and its improvement thanks to working at the organisation, making the most desirable assets the most developed ones.

Apart from the analysed competencies, participants also listed skills that they managed to acquire whilst working at BEST, showing a vast variety of abilities that respondents gained as a result of working at the organisation. Skills that some members who took part in the research would like to develop have already been acquired by other participants, illustrating that working at the organisation will probably fulfil their expectations in the future.

Limitations

Obtaining even better results would require conducting research on this group of participants before they started working at BEST and presenting them with a validated questionnaire to test their actual level of competencies. As the current assessment was based on the individual's personal feeling, the level of competency may be biased by their own judgment.

For further research, one should also consider analysing the exact tasks participants undertook while performing their function, or specifying in what training they took part and analysing changes in their level of competencies individually to see which actions had the biggest impact on developing their competencies.

References

Aasheim, C., Li, L., & Williams, S. (2009). Knowledge and skill requirements for entry-level information technology workers: A comparison of industry and academia. *Journal of Information Systems Education*, 20(3), 349–356.

BEST in Numbers. (n.d.). BEST: Board of European Students of Technology. Retrieved February 6, 2022, from https://best.eu.org/index.jsp

Chan, Y. K. (2016). Investigating the relationship among extracurricular activities, learning approach and academic outcomes: A case study. *Active Learning in Higher Education*, *17*(3), 223–233. https://doi.org/10.1177/14697 87416654795 Chapman, G., Emambocus, W., & Obembe, D. (2023). Higher education student motivations for extracurricular activities: evidence from UK universities. *Journal of Education and Work*, 36(2), 138–152. https://doi.org/10.1 080/13639080.2023.2167955

.

Cheetham, G., & Chivers, G. (1996). Towards a holistic model of professional competence. *Journal of European Industrial Training*, *20*(5), 20–30. https://doi.org/10.1108/ 03090599610119692

Cheetham, G., & Chivers, G. (1998). The reflective (and competent) practitioner: a model of professional competence which seeks to harmonise the reflective practitioner and competence-based approaches, *Journal of European Industrial Training*, *22*(7), 267–276. https://doi. org/10.1108/03090599810230678

Chrysikos, A., Ahmed, E., & Ward, R. (2017). Analysis of Tinto's student integration theory in first-year undergraduate computing students of a UK higher education institution. *International Journal of Comparative Education and Development*, *19*(2/3), 97–121. https://doi.org/10.1108/ IJCED-10-2016-0019

De Sisto, M., Huq, A., & Dickinson, G. (2021). Sense of belonging in second-year undergraduate students: the value of extracurricular activities. *Higher Education Research & Development*, *41*(5), 1727–1742. https://doi.org/10.1080/07294360.2021.1902951

Dickinson, J., Griffiths, T. R., & Bredice, A. (2021). 'It's just another thing to think about': encouraging students' engagement in extracurricular activities. *Journal of Further and Higher Education*, 45(6), 744–757. https://doi. org/10.1080/0309877X.2020.1813263

Fonseca, G., Ouazzani M. M., Verlan, V., Santos, S., Pantalona, G., Ribeiro, A., Santorinaiou, M., Nanau, A., Ersek, G., Molla, V. F., Saarniit, S., Lukacevic, O., Zacchei, F., Cruz, I., Rocha, A., Brinza, A., Zozulya, A., Bujas, H., Ulicevi, K., ... Brutaru, R. (Eds.) (2019). *History of BEST. 30th Anniversary 1989–2019*. Retrieved February 3, 2022, from https://private.best.eu.org/docs/download/ ow5uo0s/History_Book_of_BEST_-_30_Years.pdf

Fu, J. (2018). The role of two extracurricular programs in international students' informal learning experiences in Atlantic Canada [Unpublished master's thesis]. Saint Vincent University. https://ec.msvu.ca/server/api/core/bitstreams/ abdc6643-7c3d-4ade-854e-d836c08529d7/content

Geertshuis, S. A. (2019). Slaves to our emotions: Examining the predictive relationship between emotional well-being and academic outcomes. *Active Learning in Higher Education*, 20(2), 153–166. https://doi.org/10.117 7/1469787418808932

Godor, B. P. (2017). Academic fatalism: Applying Durkheim's fatalistic suicide typology to student drop-out and the climate of higher education. *Interchange*, *48*(3), 257–269. https://doi.org/10.1007/s10780-016-9292-8

Griffiths, T. L., Dickinson, J., & Day, C. J. (2021). Exploring the relationship between extracurricular activities and student self-efficacy within university. *Journal of Further and Higher Education*, 45(9), 1294–1309. https://doi. org/10.1080/0309877X.2021.1951687

The full list of references is available in the online version of the journal.

Paulina Chobot is a PhD Student at the Gdańsk University of Technology in the discipline of Management and Quality Studies. Her current research focuses on Diversity in Higher Education Institutions, and her other scientific interests include Critical Management, Human Resources Management, East-Asian Culture and Philosophy.



Michael A. Kolitsky

.

Study pace reveals differences in online learning using R-squared analysis

Abstract

Highly-enrolled fully online lectures and laboratory classes in Anatomy and Physiology, and higher-level Histology courses, were used to calculate R-squared values that could be linked to how the study method chosen by students impacted their exam grades. Student performance on major exams containing only T/F and multiple-choice questions exhibited better exam results, as did the R-squared values for those who studied using tiny quizzes at a slow pace rather than those who studied with them at a fast pace, indicating that learning was done using the flashcard method. There was a difference in grade distribution, with a peak in the A category for the slow pace quiz group, to a peak in the B category for the fast pace group. The use of Respondus with Blackboard also permitted video observation of students following the submission of exams, which did not indicate that any major cheating efforts or use of Al had taken place during major exams. The lack of evidence for cheating or Al usage makes the observation of higher R-squared values from the slow-paced quiz method a significant factor in future online course design.

Keywords: retrieval practice, R-squared, Tiny Quizzes, online learning, grade distribution

Introduction

Previous work using R-squared analysis supported the use of practice quizzes as a form of retrieval practice pedagogy (Agarwal et al., 2021; Kolitsky, 2013). Retrieval practice uses small practice quizzes with questions taken from larger pools of questions covering the material to be learned, with questions from the chapters being covered in major lecture exams or labelled images from simulated microscopy for lab exams composed of True/False and multiple-choice questions provided and referred to as "Tiny Quizzes" or TQ's (Kolitsky, 2020). Students' results on major exams were found to be linked to the number of TQ's done by using R-squared statistical analysis, which indicates how well data points fit a line (Fernando, 2024; Kolitsky, 2022). The use of R-squared analysis also showed that student use of Tiny Quizzes could be linked to how fast students studied, i.e. their study pace (Kolitsky, 2013). By using TQs, student results could be separated into a fast study group resulting in the quick download of TQ questions so that study could occur off-line in flash-card mode, and students who did the TQ questions online in a time significantly longer than students using TQs with a fast pace. R-squared analysis showed higher positive data results and better course grades for students who studied at a slower pace online using the online testing programme provided by Blackboard ULTRA (Blackboard, n.d.) coupled with the Respondus video capture technology, as opposed to the results found for students who did the TQs at a fast pace with studying taking place outside the course using flash cards.

Students' course results are also of significance with the emergence of ways to cheat with ChatGPT_or other AI alternatives, and student performance in the autumn 2023 semester is being viewed as a way to provide feedback about any widespread effort to cheat on future exams taken in an entirely online environment. Respondus software prohibits the opening of other programmes during an exam, and also keeps copies of the observed video of the student taking an exam (Respondus, n.d.) so that further analysis of that video can be studied to ascertain that no cheating by using other computers or paper copies of the material being tested are available. Three courses (Anatomy and Physiology I lecture, Anatomy and Physiology I lab and Histology) offered fully online during the autumn 2023 semester were analysed for the impact of the pace of study used by students before taking their major exams, and the effect of

Michael A. Kolitsky, The University of Texas at El Paso, United States of America, (Dhttps://orcid.org/0000-0002-9796-154X

that pace of study on the grades received for those exams.

Anatomy and Physiology I online lecture information

In Figure 1 below, the grade distribution for the autumn 2023 Anatomy and Physiology lecture course with 235 enrolled students is shown, and is typical of grade distributions for the previous three years for the same course offered under similar conditions. Videos of students taking the exam were captured by use of Respondus software and showed no evidence of cheating during the course in the fully online mode.

In order to encourage the use of Tiny Quizzes (TQs) in the retrieval practice mode of study, some small amount of credit was assigned to using TQs a minimum of 10 times, and then for each following five TQs. Figures 2a, 2b and 2c below were used to study and compare the tightness of fit as indicated by the calculation of R-squared values for the total TQ point scores and the actual exam results generated for those TQ values, which showed an interesting phenomenon linked to the way that students use the retrieval practice learning strategy that emerges from how much time they spend doing the quizzes in the retrieval practice mode. It was found that some students take their time with the practice TQs, labelled in Figure 2b as "Slow Pace Per Quiz", compared to the results in Figure 2c, labelled as "Fast Pace Per Quiz", and which includes those TQ scores for students who spend very little time doing the first 10 TQs before doing the next five TQs for credit. Feedback from emails sent to students indicated that students who quickly downloaded the first 10 sets of TQ questions and were included in the "Fast Pace Per Quiz" category were downloading TQ files and using them for study using the flash card method, i.e. shuffling downloaded physical cards and then studying them as they appear in order from a shuffled stack. Surprisingly, the calculation of points earned for these two methods of study differed significantly, as seen in Figure 3 below, in which the grade distribution for students using the Fast Quiz study method shifted to the lower grade category and now showed a peak in the B region. In this case, the R-squared analysis proved essential in clarifying the best study method for learning the lecture material being tested.

Figure 1

Grade Distribution for AP Lecture – Fall 2023



Source: author's own work.

Figure 2a

R-squared Analysis of AP Lecture – Autumn 2023



Source: author's own work.

Figure 2b

R-squared Analysis of AP Lecture – Autumn 2023, Slow Pace Per Quiz



Source: author's own work.

Figure 2c

R-squared Analysis of AP Lecture – Autumn 2023, Fast Pace Per Quiz





Source: author's own work.

Figure 4



Figure 5

R-squared Analysis of AP Lab – Autumn 2023



Source: author's own work.

Figure 6



Anatomy and Physiology I Online Lab Information

Figure 4 below shows the grade distribution for the autumn 2023 Anatomy and Physiology lab course enrolling 177 students, and the grade distribution is similar to that found for the previous three years for lab courses offered under similar conditions. Respondus was used to capture a video of students taking the exam, with the video showing no evidence that cheating or the use of AI was being employed in the offering of this fully online lab course.

Figure 5 below studies the tightness of fit for the R-squared values obtained for the Quiz scores generated while studying for the exam with the exam points earned from doing the lab exams. Appendix A contains two additional graphs further supporting that the pace of study of the Tiny Quizzes impacted the measured performance of students taking the lab exams. Those graphs show a calculated R-squared value of 0.4563 for exams taken by students studying at a slow pace versus an R-squared value of 0.2179 calculated for students studying for the exam at a fast pace.

The pace at which the Quizzes were done also impacted the lab grade distribution, as seen in Figure 6, which shows a decrease in A grades and an increase in B grades when Quizzes were done at a fast or rapid pace.

Histology Online Course

It is important to point out that the higher-level Histology course was offered with both the lecture material and the lab component in the same course, i.e. the lab portion was not offered separately from the lecture material.

Figure 7 below shows the grade distribution for the autumn 2023 Histology course enrolling 177 students, and the grade distribution is similar to that found for the previous three years for courses offered under similar conditions. Respondus was used to capture a video of students taking the exam and showed no evidence that cheating or the use of AI was used in this fully online lecture and lab course.

R-squared analysis of the Histology lecture grades collected for the entire class is shown in Figure 8. Appendix B contains two additional graphs for the Histology lecture, which further support that the pace of study of the Quizlets had an impact on the measured performance of students taking the lecture exams. These graphs show a calculated Rsquared value of 0.298 for exams taken by students studying at a slow pace versus an

e-mentor nr 5 (107) 49

R-squared value of 0.1036 calculated for students studying for the exam at a fast pace.

It is also of interest to see in Figure 9 that the grade distribution differed for the students based on their choice of study, in which it can be seen that the slow study group (blue bars) showed a grade distribution that increased in percentage toward the A category, but the fast study section (orange bars) showed a peak in the B category.

The grade distribution shown in Figure 10 for the lab component also appeared normal for the autumn 2023 course when compared to grade distributions from previous years.

A similar pattern was observed in a comparison for R-squared values where exam scores were compared between groups using the slow study method and those students using the fast study method. The R-squared value for the entire class is seen in Figure 11, and Appendix C contains the R-squared graphs and values obtained for both the slow Quiz time and the fast Quiz completion times. The R-squared values were higher for students studying Quizzes at a slower pace when compared to that found for students studying Quizzes at a fast pace.

In Figure 12 below, the grade distribution for slow versus fast study pace was higher, but the peak in the B category observed for the lecture lab component was not found for the lab data. Observations and analysis of Respondus videos collected during the exam sections did not show any observable signs of cheating or Al usage. The slow versus fast differences to studying for the lab exams, which focused more on identifying structures and cell patterns in images, may indicate that studying images with labels may not be as sensitive to the speed of studying phenomena observed for the Anatomy and Physiology lab exam. Histology is also a higher-level class for Biology majors who may be more experienced in the study of cell and tissue images, which might result in less of a difference in the slow versus fast observed phenomenon in the Anatomy and Physiology lab.

Conclusions

It is of interest that the successful study of material – textual and image-based, can be affected by the speed taken to complete the tiny quizzes, i.e. the pace of study, designed to assist students in learning the material that must be mastered to do well on the larger exams. Each of the tiny quizzes used for study were offered with a small amount of credit, for example 0.5% of the final grade

Figure 7

Grade Distribution for Histology Lecture, Autumn - 2023



Source: author's own work.

Figure 8

R-squared Analysis of Histology Lecture - Autumn 2023



Source: author's own work.

Figure 9

Grade Distribution – Slow versus Fast Quizzes



Source: author's own work.

Figure 10

Grade Distribution Histology Lab, Autumn - 2023



Histology Lab Exam – All Quizzes



Source: author's own work.

Figure 12

Grade Distribution - Slow versus Fast



Source: author's own work.

calculations, to encourage their use in the study effort. And, to further place the quantitative monitoring on an easy schedule for grading, students were told that the first 10 quizzes done constituted an entry into the points earned category, so that then the next five tiny quizzes done, i.e. quizzes 11–15, counted for credit, with 0.5 points out of the possible 100 points to be earned for the course grade. Once the first set of 10 tiny quizzes was done, then the next five or even more than that, for example, guizzes 16–20 or 22–26, could be done until the student felt they had mastered the material. But it was always the last five tiny quiz scores after doing a minimum of 10 that counted for credit for that particular tiny quiz. This method of waiting for at least 10 tiny quizzes to be done before doing quizzes that counted for credit may have been the reason for two ways of earning quiz credits emerging, since some students just opened and then quickly closed the first 10 quizzes, so that the next five would now be in the category where credit could be earned. The students who did the first 10 guizzes guickly were the ones categorised as the fast-paced quiz takers, while the students who took their time to do the guizzes in the first 10 category were the ones who on average did significantly better when taking the major exams for the lecture or lab. It is also of interest that the differences observed between the slow and fast-paced quiz takers seem to focus on how slowly each group did the first 10 quizzes, which did not count for credit,

but was likely a way that better cemented what was needed to be learned to do well on the major exams for which the students were studying.

One of the main lessons learned from this study is that retrieval practice is an important method to learn what will be tested, but by itself, it is only a first step toward understanding the role and importance of pacing in the process of learning material to be tested. When the pace of study time was compared, there was a clear distinction between students who paced their study by using the tiny quizzes as delivered inside the course compared to those who studied the same material. but downloaded and mastered outside the course. The message guiding teachers is that R-squared calculation of retrieval practice results based on the time devoted to the pace of study is an important way to determine how well students know the material being tested. And there is also a message aimed for, and also guiding, students in this process, as they will now have a better understanding of how to pace and design their own study efforts in learning the material to be tested.

Exactly how much this phenomenon of slow-pace quiz studying can be more productive for learning than fast-pace quiz studying is transferable to other courses where more than T/F or multiple-choice questions are used to assess what is learned still needs to

be studied. For the courses in this study, the material covers vocabulary and the definitions of words that describe the structure and/or function of the cells and organs making up the human body. Courses in other disciplines, in which a certain vocabulary must first be mastered before functional or higher-level conclusions are discussed, may find the slow pace of learning to be of value when designing questions for study purposes.

References

Agarwal, P. K., Nunes, L. D., & Blunt, J. R. (2021). Retrieval practice consistently benefits student learning: A systematic review of applied research in schools and classrooms. *Educational Psychology Review*, 33(4), 1409– 1453. https://doi.org/10.1007/s10648-021-09595-9

Blackboard. (n.d.). *What is "Ultra"*? Retrieved May 27, 2024, from https://help.blackboard.com/Learn/Student/Ul-tra/Getting Started/What Is Ultra

Fernando, J. (2024). R-Squared: Definition, calculation, and interpretation. *Investopedia*. https://www.investope-dia.com/terms/r/r-squared.asp

Kolitsky, M. A. (2013). Teaching anatomy online using retrieval practice, 3D stereoscopic images and virtual human fly-through videos. *FASEB Journal*, *27*(S1). https://faseb.onlinelibrary.wiley.com/doi/abs/10.1096/ fasebj.27.1 supplement.960.28

Kolitsky, M. A. (2020). Retrieval practice enhances online learning in academic courses. *e-mentor*, 2(84), 47–53. https://doi.org/10.15219/em84.1464 Kolitsky, M. A. (2022). Use of retrieval practice data as a learning analytics tool. *FASEB Journal*, *36*(S1). https://doi.org/10.1096/fasebj.2022.36.S1.L7427

Respondus. (n.d.). *LockDown Browser. Prevent cheating during online exams.* Retrieved May 22, 2024, from https://web.respondus.com/he/lockdownbrowser/

Appendix A

Figure 5a

R-squared Analysis of AP Lab – Autumn 2023, Slow Time Per Quiz



Source: author's own work.

Figure 5b

R-squared Analysis of AP Lab – Autumn 2023, Fast Time Per Quiz



Source: author's own work.

Appendix B

Figure 8a

R-squared Analysis Histology Lecture – Autumn 2023, Slow Time Per Quiz





Source: author's own work.

Figure 8b

R-squared Analysis Histology Lecture – Autumn 2023, Fast Time Per Quiz

Source: author's own work.

Appendix C



Source: author's own work.

.

Michael A. Kolitsky has a PhD from Temple University in Philadelphia, PA., and is now retired but teaching online for The University of Texas at El Paso (UTEP). Mike was a tenured professor of Biology at UTEP, and was also appointed Associate Vice President for Instructional Technology overseeing the technology design and faculty training for a new Undergraduate Learning Center. He was the Principal Investigator for a 2.5 million dollar NASA grant to establish an instructional support and training center at UTEP for University and regional K-12 instructors. Mike also received a University of Texas Chancellor's Distinguished Teaching Award at UTEP, and was also awarded a Distinguished Natural Sciences Curriculum Innovation award for his Embryology videodisc and HyperEmbryo courseware from EDUCOM. After leaving UTEP, he was appointed a founding board member for NJEDge.Net, the higher education network for New Jersey, and served as Dean of Academic Computing and Distance Education at Atlantic Cape Community College prior to retirement. He was also a consultant for the Rutgers University Library FIPSE grant to establish the New Jersey Digital Highway, and assisted in the production of several shared content objects (SCOs) with The University of Wisconsin-Madison Academic ADL Co-Lab FIPSE-sponsored effort to support effective online teaching. Mike is currently exploring how 3D laser cutting technology can be used in making audio-responsive tactile templates for learning cell biology and anatomy by blind or visually impaired students.

RECOMMEND



Virtual International Academic Conference on Global Education and E-learning (VIAC-GEE 2025), 28 February 2025, online

International Academic Conferences are an important international gathering of scholars, educators and PhD students.

Conference organized by the Czech Institute of Academic Education, z.s. in cooperation with the Czech Technical University in Prague. Conference topics include: education, teaching, learning and e-learning education, teaching and learning, distance education, higher education, pedagogy, Erasmus and exchange experiences in universities, e-learning educational technology, educational games and software, and many others.

More information at: https://www.conferences-scientific.cz/inpage/conference-virtual-iacgee-2025/ "E-mentor" is one of the International Academic Conferences supporting journals.



Alicja Winnicka--Wejs

Green Human Resource Management practices and the pro-environmental behaviour of employees in the TFL sector

Abstract

This article has cognitive value for the development of knowledge in the field of the sciences of management and quality, raising awareness of the ecological dimension of sustainable human resource management and providing the results of an own survey conducted within TFL sector entities in Poland. A survey questionnaire was developed for the purpose of the study, and a diagnostic poll based on a purposive sample and a statistical method analysis were applied. The survey data shows that the respondents from micro companies rate the environmental awareness level higher than middle-sized and large companies, and the pro-environmental behaviour of respondents from the TFL sector refers mainly to the basic level. In their view, the sustainability value is currently implemented to a limited degree. While performing pro-environmental activities in their workplace they rate organisational support higher than that of the managers. Green Human Resource Management processes are implemented in only one-third of the companies surveyed, and only 40% of the respondents believe that ecological objectives are truly executed and pro-environmental activities are important.

Keywords: GHRM (Green Human Resource Management), TFL (Transport-Forwarding-Logistics), sustainability, Green HR Practices, pro-environmental behaviour

Introduction – review of literature on Green Human Resource Management

Green Human Resource Management (GHRM) is the most widely explored sub-concept of Sustainable Human Resource Management in literature (Piwowar-Sulej, 2021a), occurring alongside the Triple Bottom Line approach of HRM, the common good and socially responsible HRM (Ehnert et al., 2020). Green HRM encompasses HRM practices that are aligned with environmental sustainability goals and are aimed at developing employee skills and their commitment to achieving these goals at the company level (O'Donohue & Torugsa, 2016). GHRM is a set of HRM practices that are friendly to the (internal and external) environment of the organisation and aim at the sustainable use of all kinds of resources (Bangwal & Tiwari, 2015).

A review of the foreign literature on the subject indicates that GHRM is currently considered an important topic in recent research (cf. Dumont et al., 2019; Jain & D'lima, 2018; Opatha & Kottawatta, 2020; Paillé, 2022; Ren et al., 2018; Renwick, 2018; Renwick et al., 2012; Renwick et al., 2015; Shah, 2019; Shen et al., 2018; Wagner, 2013; Yusoff et al., 2020; Zaid et al., 2020; Zoogah, 2011), and which requires practical exploration (Andjarwati et al., 2019). To date, research on Green Human Resource Management has focused on the themes of organisational and employee effectiveness, job satisfaction, attitudes towards the environment, green lifestyles, green organisational culture, and green empowerment, among others (more in: Łabędzki, 2022).

In the Polish literature on the subject, four monographs are worth citing: Bugdol and Stańczyk, 2021; Kozar, 2019; Piwowar-Sulej et al., 2023; Wojtczuk-Turek, 2022. The results of research on the implementation of Green HR Practices in contemporary

Alicja Winnicka-Wejs, The University of Economics in Katowice, Poland, 🝺 https://orcid.org/0000-0001-8263-8064

.

companies are also interesting (cf. Matejun et al., 2020; Matusiak et al., 2020; Piwowar-Sulej, 2021b; Piwowar-Sulej, 2021a; Różańska-Bińczyk et al., 2020; Zaleśna & Wyrzykowska, 2017).

In Poland, Green Human Resource Management is mainly applied by large companies and corporations, following the example of companies operating in Western Europe. The leaders are those companies that have already implemented the ISO 14000 environmental management system (Różańska-Bińczyk, 2020). The analysis shows that Green HRM in Poland is still a relatively unknown initiative, not deeply rooted in the consciousness of Polish entrepreneurs, and that the model is at an early stage of maturity (cf. Bombiak, 2019; 2020a). It should be noted that this is a new model for the implementation of the HR function, the essence of which is to strive for a balance between economic rationality and social and ecological responsibility, which also represents a new trend in the field of HR (Bombiak, 2020b). Here, ecological goals are included in all sub-areas of HR management, from employment planning, recruitment, selection, motivation, staff development, to employee assessment and the impact on working conditions (Bombiak & Marciniuk-Kluska, 2018). It turns out that "green" can be the colour of business (Janik, 2021), and properly managed Green HRM can benefit both companies and employees (cf. Ackermann, 2017; Beck-Krala & Klimkiewicz, 2017; Kozar, 2017; Urbaniak, 2017).

Despite the fact that more and more is being said and written about ESG (Environmental, Social and Corporate Governance) and green HRM (Green Human Resource Management), there is a noticeable research gap in the area of knowledge of the implementation of green HRM processes in a specific industry, e.g. in the TFL (Transport – Forwarding – Logistics) sector, where Transport is a set of activities related to the movement of people and material goods using appropriate means (Fertsch, 2016c, p. 218), Forwarding - the organisation of the transport of cargo and the performance of all necessary related activities (Fertsch, 2016b, p. 189), and Logistics - the management of the processes of moving goods and/or people and the activities supporting these processes in the systems in which they occur (Fertsch, 2016a, p. 89) (more in: Debkowska, 2017). For example, monographs in the field of logistics devote more space to the material elements of the logistics system, logistics processes rather than human resources and their management (cf. Bardy et al., 2016; Kauf et al., 2019; Kolasińska--Morawska & Sułkowski, 2022; Kozar & Matuszewska--Kubicz, 2022; Krawczyk, 2020; Tundys & Wiśniewski, 2018; Witkowski, 2010; Zowada, 2020). Additionally, conversations with practitioners (extra-mural students) during the Author's classes in the subject Logistics Management at the University of Economics in Katowice in the academic year 2021/2022 confirmed the Author's conviction that it is worth undertaking research in the field of Green Human Resource Management processes in the TFL sector.

Research methodology and description of respondents

The aim of the study is the scope of implementation of green HRM practices in the TFL sector and determining the perceived sustainability value in the TFL sector in Poland, and the utilitarian objective of the study is connected with the preparation of results to be used by both theoreticians and practitioners professionally related to the TFL sector. The following research questions were formulated:

- Q 1: What is the environmental awareness of employees in TFL companies and at what level is their pro-environmental behaviour in the workplace?
- Q 2: How is the value of sustainability perceived by employees in the TFL sector?
- Q 3: Do employees in the TFL sector receive adequate organisational and managerial support in implementing pro-environmental measures?
- Q 4: Which Green Human Resource Management processes are present and implemented in TFL companies?
- Q 5: What are the opinions of practitioners in the TFL sector on pro-environmental and sustainability practices?

A survey questionnaire consisting of 15 questions was constructed for the purposes of the study, inspired by the book Bugdol and Stańczyk (2021). The main constructs used in the study relate to Green Human Resource Management processes, environmental awareness, pro-environmental behaviour and sustainability values. Green Human Resource Management processes include recruitment and selection, adaptation and socialisation, employee education and training, performance management, pay and rewards, environmental engagement, green leadership, green HR (cf. Bugdol & Stańczyk, 2021), as well as green perceived organisational support (cf. Bugdol & Stańczyk, 2021). Environmental awareness has been recognised as one of the components of environmental measurements (cf. Alomari & Ibraheem, 2019) influencing the 'green behaviour' of employees (cf. Safari et al., 2018; Shah, 2019). Levels of pro-environmental behaviour were taken from a self-assessment questionnaire of pro-environmental behaviour (Bugdol & Stańczyk, 2021), while the value of sustainability was determined using 3 items from previously conducted studies (Herman et al., 2016).

The preparation of an online research tool, as well as nationwide research, was commissioned to the Research and Development Centre of the University of Economics in Katowice, whose service and research offer includes market and marketing research. The R&D Centre was selected, among other reasons, for its up-to-date and verified database of entities from the TFL sector, as it had previously carried out a project commissioned by the Ministry.

Prior to the start of the actual survey, which took place between 1 February 2022 and 22 February 2022,

a pilot survey (on 16 January 2022) was conducted among practitioners, extramural students of the University of Economics in Katowice at the Logistics faculty, which enabled the content of the survey questions to be refined.

A link to the survey was sent to TFL sector entities operating in Poland, following phone calls requesting the completion of the survey. The territorial scope of the survey covered the entire country. According to the CSO's LDB, in 2019, there were 176,472 local entities in Section H (Transport and Warehousing), employing 944,719 people (GUS, n.d.). This section includes activities related to the transport of persons or goods performed by rail, pipeline, road, water or air transport, activities supporting transport provided by stations, ports, railway stations, bus stations, terminals for traffic control, handling of passengers, baggage and cargo, rental of transport equipment with a driver and crew, and postal and courier activities (Gofin, n.d.). A diagnostic survey was carried out using a single-sample survey with a survey questionnaire, which, due to the frequency of implementation, was defined as ad hoc. The research sample was purposive, consisting of entities from the TFL sector and using the R&D Centre database.

A total of 200 questionnaires were obtained, with the survey completed by 64% of men and 36% of women. The respondents included owners (9%), managers (27%) and professionals (64%), with 39% of respondents aged 40–49, 32% aged 30–39, 16% aged 50–59, 8% aged 29 or under, 2% aged 60 or over, and 3% not indicating an age. Respondents were also diverse in terms of their experience of working in the TFL industry, with most of them (44%) declaring work experience in the range of 6–15 years, followed by: several years – up to 5 years (26%), and 16–25 years (20%). 10% of respondents admitted to having more than 25 years of experience, including 26 to 35 years (9%), and 36 years and more (1%).

The majority of respondents worked in small and medium-sized companies, with only 16% working in large organisations (more than 250 employees). A more detailed split showed 19% working in companies with up to 9 employees, 41% in companies with 10 to 49 employees, and 24% in companies with 50 to 249 employees.

Responses were obtained from all 16 voivodeships: mazowieckie (36% of responses), łódzkie (20%), lubuskie (10.5%), małopolskie (7%), śląskie (6%), pomorskie (4%), wielkopolskie (2.5%), kujawsko-pomorskie (2%), podkarpackie (2%), opolskie, podlaskie, świętokrzyskie, zachodniopomorskie, dolnośląskie and lubelskie (1.5% each), and warmińsko-mazurskie (1%).

Environmental awareness and pro-environmental behaviour of TFL employees

At the beginning of the survey, respondents were asked to assess the level of environmental awareness of employees in the company they work for. Around 45% of the respondents assessed the environmental awareness of employees from TFL companies at an average level. On a scale of 1 (very low) to 5 (very high) – "3" occurred most frequently, as shown in Figure 1.

Interestingly, there were differences in the assessment according to the size of employment in the company, with respondents from micro companies assessing the level of awareness as higher in comparison with medium and large companies (cf. Figure 2).

The respondents also self-assessed their own proenvironmental behaviour in the workplace, as shown in Figure 3.

Figure 3 shows that four activities (segregating rubbish, turning off the lights, using water appropriately, not printing unnecessary documents) are performed by the majority of respondents, although it should be emphasised that these are pro-environmental behaviours at the basic level (cf. Bugdol & Stańczyk, 2021). Behaviours from the systemic level (e.g. reporting preventive actions) or the active level (e.g. attending environmental conferences) are "never", "very seldom" or "seldom" performed. For example, 72% of the respondents have never or (very) seldom authored environmental awareness training, or education of employees in that field.

Figure 1

Assessment of the level of environmental awareness of employees in the companies the respondents work for



Source: author's own work.

Assessment of the level of environmental awareness of employees in the company according to the size of employment in the respondent's company



Source: author's own work.

Figure 3

Self-assessment of own pro-environmental behaviour in the workplace according to respondents



Source: author's own work.

Perception of sustainability as a value

One of the survey questions concerned the perception of sustainability in the companies the respondents work for. The question "In your opinion, does the company you work for deserve to be labelled as a green sustainable company?" was answered in the affirmative by less than half of the respondents: 17.5% – "agree" and 28.5% – "moderately agree", while 35.5% evaluated their company negatively in this respect (9.5% – "disagree", 26% – "moderately disagree"). 18.5% marked the answer "neither agree nor disagree" (cf. Figure 4).

Analysis of the obtained answers with the use of the Kruskal-Wallis test showed that the differences are only attributable to the size of the company, with respondents from the smallest companies (with up to 9 employees) more likely to say that their company deserved to be called a green sustainable company.

The next question was posed to check the extent to which the value of sustainability is a precious value

The structure of respondents' answers to the question "In your opinion, does the company you work for deserve to be labelled as a green sustainable company?"



Source: author's own work.

Figure 5

The structure of respondents' answers to the question "Sustainability is:... Please select the appropriate answer that reflects this value in your company"



Source: author's own work.

that is taken seriously, with the content of the question taken from a study (Herman et al., 2016). The results of the answers to the question "Sustainability is:..." with an option of three choices are presented in Figure 5.

As the presented results show, the perception of sustainability as a value is noticeable but implemented to a limited extent (43% of responses), with only 27.5% of respondents identifying sustainability as a precious value that is taken seriously in companies and is already being implemented. What is worrying is that for 29.5% of respondents, this value is controversial, as they believe that the concept of sustainability is not appropriate for the companies in which they are employed. The results obtained in this respect differ from those obtained in a survey conducted among 512 organisations in Poland in 2013 (cf. Herman et al., 2016).

An examination of the correlations between the metric variables and the assessment of the importance of the value of sustainability in the company using Chi-Square/Fisher's Exact Test of independence showed significant correlations, although very weak ones between the assessment of the importance of this value and the position and work experience in the TFL industry.

Organisational and managerial support in the implementation of pro-environmental measures in the workplace

Respondents from the TFL industry were also asked whether they receive adequate organisational and managerial (supervisor's) support in the implementation of pro-environmental measures in the workplace. The answers to this question are presented in Figure 6.

Figure 6 shows that respondents from the TFL industry assess organisational support as higher than managerial support, with half of them saying that they receive adequate organisational support in the implementation of pro-environmental measures in the workplace (18.5% – agree, 31.5% – moderately agree), and 43.5% being of the same opinion with regard to managerial support (19.5% – agree, 24.0% – moderately agree). By calculating the basic statistics, it emerges that in the case of organisational support the dominant, i.e. the most frequent response is "4"

Organisational and managerial support in the implementation of pro-environmental activities in the workplace according to respondents from the TFL industry





Source: author's own work.

(moderately agree), while for managerial support it is "3" (neither agree nor disagree).

Green Human Resource Management processes in TFL companies

The answers to the question concerning the presence and implementation of Green Human Resource Management processes in TFL companies are interesting. Respondents' answers to this question are presented in Figure 7.

As the data in Figure 7 shows, half of the respondents believe that the company's strategy, vision and values relate to green goals, and that the organisational culture fosters employees' green behaviour at work. Subsequently, 40% of the respondents are of the

Figure 7

Green Human Resource Management processes in TFL companies according to respondents



Source: author's own work.

.

.

opinion that their superiors, by their own behaviour and attitudes, change the environmental awareness in the company, and provide support to employees to achieve environmental goals, although 32% are of the opposite opinion and do not see green leadership in their companies.

40% of respondents indicated that their companies take care of the space in which employees work – green buildings, energy-efficient offices, gardens, and company cars. In other words, green infrastructure is of importance to these companies.

Unfortunately, the results show that Green Human Resource Management processes are not yet present in most TFL companies, with only 38% of the respondents indicating that their companies have performance management with established transparent standards for green performance evaluation and improvement of the efficiency of green performance evaluation.

In practically only one in three companies: employees receive encouragement to make suggestions on environmental management and autonomy in terms of environmental management (green commitment); employees participate in training on environmental protection, environmental ethics, and environmental management systems (employee education and training); during the selection process, job candidates' environmental attitudes and capabilities are analysed (green recruitment and selection); HR professionals are the architects of solution proposals for promoting the pro-environmental behaviour of employees (green HR); environmental management systems and TQEM concepts are implemented, maintained and improved; financial and non-financial incentives are applied for environmentally-friendly practices undertaken by employees (payments and rewards); new employees take part in various "green" activities during their first months at work (green onboarding and socialisation).

The basic statistics in Table 1 show that the worst situation is in the area of remuneration – the dominant value is a negative "1"(disagree), and in the area of onboarding and socialisation of new employees – the dominant value is a negative "2"(moderately disagree).

Table 1

Basic statistics for the questions about processes of Green Human Resource Management in TFL com	panies
--	--------

	Median	Mode	Quartile 1	Quartile 2	Quartile 3
The company strategy, vision and values are linked to environmental goals, and the corporate culture fosters environmentally friendly behaviour of employees at work.	4	4	2	4	4
During the selection process, the attitudes and environmental capabilities of job candidates are analysed.	3	3	2	3	4
New employees take part in various "green" activities during their first months on the job. Attention is paid to environmental issues.	3	2	2	3	4
Employees participate in training on environmental protection, environmental ethics, environmental management systems, etc.	3	3	2	3	4
There are transparent standards established for the environmental assessment of performance, and for improving the environmental effectiveness of the company performance evaluation.	3	4	2	3	4
The company uses financial and non-financial incentives for environmentally friendly practices undertaken by employees.	3	1	2	3	4
Employees within the company are encouraged to make suggestions on environmental management, and they are given autonomy in terms of environmental management.	3	4	2	3	4
Superiors change the environmental awareness in the company by their own behaviour and attitude, they provide support to employees to achieve environmental goals.	3	4	2	3	4
Environmental management and TQEM concept system – environmental management systems are implemented, maintained and improved in the company.	3	3	2	3	4
Green infrastructure – the company pays attention to the space where the employees work (green buildings, energy-efficient offices, gardens, company cars, etc.).	3	4	2	3	4
Green HR – HR professionals are the architects of solution proposals for promoting environmentally-friendly employee behaviour.	3	3	2	3	4

Source: author's own work.

Green management – opinions of practitioners

The opinions of the respondents on green management in the TFL industry are quite diverse, with 40% believing that "in the company, we are honest in the implementation of environmental goals and pro-environmental activities are important to us", 34% emphasising that "in the company, there is no pro-environmental strategy, only economic goals count", and 23.5% believing that "the company only declares certain environmental practices, but in reality conducts so-called greenwashing, 2.5% of the respondents marking "other", writing the following sentences: "sometimes it is one way and sometimes the other", "procedures are in place because they are required by the EU", "only part of the management adjusts to the requirements of green management", "there are rules and regulations in the company, but people do not follow them", "it all depends on the employees themselves - procedures are there, but many/most employees do not follow them".

Figure 8 shows the opinions of respondents on green management in TFL companies.

It is worth noting the final, open-ended survey question, to which respondents were able to write their own comments on green practices and sustainability, with 42.5% of respondents using this opportunity and sharing their thoughts on the subject. The 85 responses obtained were grouped thematically and tabulated (cf. Table 2).

The data in Table 2 shows that 38 respondents shared examples of good practices with regard to sustainability, and the picture emerging from a close analysis of these comments is one of TFL organisations that are predominantly taking action in the area of green infrastructure. What matters is the influence of foreign collaborators and the awareness and attitude of owners or managers. In these comments, Green Human Resource Management processes related to green leadership and performance management were evoked.

However, the majority of respondents who shared comments highlighted some limitations in the implementation of green and sustainable practices in

Figure 8

Opinions of respondents from the TFL industry on green management in companies

.



Source: author's own work.

Table 2

Respondents' comments on green and sustainable development practices in TFL companies

Thematic grouping of comments	Sample comments	Number of comments
Examples of green practices implemented in the organisation	 We take care of quality with the lowest possible emissions The company tries to implement eco solutions, the owner sets a very good example making it easier to maintain certain standards We are involved in transferring transport from road to rail Our consortium partner – a company from Sweden – puts great emphasis on these activities, hence the requirements are set so high with us For several years we have been focusing on green politics and it brings results Fuel efficiency, hybrid buses, rubbish bins in offices, several buildings insulated We provide training, we follow green principles There are buildings with polystyrene thermal insulation there are photovoltaics on two buildings, solar buses, but this accounts for 15% of the total We support the implementation of the UN Sustainable Development Goals Replacing rolling stock with environmentally friendly units (hybrid, electric) Sustainable development is one of the pillars of our activity 	38

New trends in management

e-mentor

.

10

Table 2 – continue

.

Thematic grouping of comments	Sample comments	Number of comments
Lack of a pro-environmental strategy and green practices	 No sustainability strategy There is no such vision The company has no pro-environmental strategy We try to be pro-environmental, but we do not have any strategies implemented in this regard There are no practices at all There are no such practices The company has no such practices, it only implements what is essential and necessary The company does nothing in terms of the environment The company does not implement such practices There is no caring about the environment 	15
Cost barrier	 The industry does not see this as a tangible profit but a current cost They are constantly looking at the cost of these solutions, Environmental declarations are not implemented to the extent they should be for economic reasons The company does not try to be eco-friendly, as the introduction of such measures involves costs that the company cannot afford Our company cannot afford these measures yet, not after the pandemic We are looking at costs rather than ecology TFL in Poland cannot afford such measures for the time being, we are struggling to stay on the European market The costs are too high for the company to become fully green 	13
Insufficient level of practice implementation	 It is not yet that developed, but it is going in the right direction There is still a lot of work and learning ahead of us Practices applied in the company are at an accessible level, but there is still a lot of room for improvement There is rather not enough of it They are implemented, but not to a sufficient extent In our company, the company pays very little attention to such solutions I believe that the company tries to be environmentally friendly, but it is not always possible There are definitely too few of them 	10
Low environmental awareness	 The company has very little awareness There is a lot to be done to change the awareness of each employee through appropriate motivation to take ecological action. This process should start from the top Team cooperation and employee awareness is important Too little awareness among people 	6
Declaration of a "green" organisation without actual actions	 The company wants to be perceived as green but does not do much about it There are guidelines, but they are not followed More is said than done in this area 	3
Total		85

Source: author's own work.

the TFL industry. First of all, they observe a lack of any environmental strategy or activities in this area. In addition, they distinguished the issue of cost barriers, where economic considerations win out over sustainability. In the opinion of some of them, the level of implementation of environmental practices is insufficient and there is still much room for improvement in this area. There is also a need to change the environmental awareness of employees. Some companies declare their pro-environmental sustainability or want to be perceived as such, although they do not undertake any actions in this area.

Conclusions

The 2022 empirical survey of TFL sector players provided interesting findings on Green Human Resource Management processes, including answers to the following research questions, thus meeting the research objective:

• Q 1: The environmental awareness of employees in TFL companies is at an average level. The majority of respondents have a basic level of environmental behaviour in the workplace.

- Q 2: The value of sustainability is perceived in various ways by employees in the TFL sector. Most (43%) see it as valuable, but it is currently only implemented to a limited extent.
- Q 3: Half of the employees surveyed in the TFL sector receive organisational support in the implementation of environmental measures. Less than half (43.5%) may count on managerial support in this regard.
- Q 4: In the surveyed companies from the TFL sector, Green Human Resource Management processes (e.g. environmental involvement, employee education and training, green recruitment and selection) are present and implemented in one in three of them.
- Q 5: The opinions of surveyed practitioners from the TFL sector on green practices and sustainability are varied. 40% of them believe that environmental goals are fairly implemented in the company and that pro-environmental activities are important, while 34% are of the opinion that there is no pro-environmental strategy in the company and only economic goals count. It is also worrying that 23.5% assessed the company's actions as "greenwashing".

Respondents highlighted the excessive costs associated with implementing green practices, especially for small companies, and in the post-pandemic period. The TFL industry in Poland is looking at costs rather than ecology. Perhaps in the face of the importance of ESG, the growing expectations of sustainable business practices, and the risk of ending business relationships on this basis (including exclusion from tenders), actors in the industry will change their attitude and start to apply green practices more often and sign green contracts, which are still a novelty in Poland (more in: Puls Biznesu, 2022).

The survey shows that employees in the TSL industry do not get enough support from their superiors, and the need to deal with sustainability issues in organisations should be addressed with the concept of sustainable leadership (cf. Ferdig, 2007; Hallinger & Suriyankietkaew, 2018; Iqbal & Ahmad, 2021; Lee, 2017; Peterlin et al., 2015). Future research developments in this area should focus on specific practices undertaken at the organisational level and the implementation of specific tasks in this area (cf. CISL, n.d.).

The resulting comments on pro-environmental practices are in line with other findings from studies conducted in Poland – they are not always carefully planned (cf. Lulewicz-Sas & Zubek, 2022; Wielewska, 2023). There is work to be done in the analysed area, and changes in companies' practices are inevitable due to the need to protect the environment and pressures from various stakeholders (cf. Piwowar-Sulej, 2021b).

In the not-too-distant future, all companies, including those in the TFL sector, will be forced to take action in the area of sustainability and operate with regard to the world we will leave behind for the next generations, who are increasingly aware of and interested in "being green" (cf. Muszyńska, 2021).

The survey had a number of limitations that are worth mentioning. Due to the fact that the research sample was non-random, one has to be careful when formulating conclusions, as it is not legitimate to generalise them. Only 200 responses were obtained, which impacts the issue of representativeness, which means that the research sample characteristics are not representative for the whole population of TFL entities. Moreover, the empirical research was conducted in 2022 and its results are likely to be different today, taking into account the change in the ecological awareness in the sector that was surveyed. The data analysis employed basic statistical tools, such as mean and median, as well as the Mann-Whitney U Test and Kruskal-Wallis Test. The research did not pose any research hypotheses, nor did it utilise a more sophisticated research model or more advanced SPSS tools.

.

Further research in the field of Green Human Resource Management processes should be continued in the direction of qualitative presentations of case studies from the TFL sector, and based on specific practices in selected sections of the Transport and Warehousing Industry; it could, for instance, analyse railway transport and road transport separately. The implementation of selected HR processes in the TFL sector could be made more specific by focusing on a given area, such as the environmental training of employees. The plenary session "Trends and Practices of Sustainable HRM in Organisations" (SGH, 2024) may inspire further research in the field.

References

Ackermann, K. F. (2017). Exploring Green Human Resource Management: Knowledge-based state of the art. *Zarządzanie Zasobami Ludzkimi*, 6, 21–39.

Alomari, M., & Ibraheem, A. (2019). Environmental performance measurement. Review of indicators and obstacles. *International Journal of Financial Management*, 9(3), 1–8.

Andjarwati, T., Budiarti, E., Audach, A. K., Khouri, S., & Rębilas, R. (2019). The impact of Green Human Resource Management to again enterprise sustainability. *Polish Journal of Management Studies*, 20(2), 93–94. https://doi. org/10.17512/pjms.2019.20.2.08

Bangwal, D., & Tiwari, P. (2015). Green HRM – A way to greening the environment. *Journal of Business and Management*, *17*(12), 45–53.

Bardy, E. J., Coyle, J. J., & Langlay, C. J. Jr. (2016). Zarządzanie logistyczne. Polskie Wydawnictwo Ekonomiczne.

Beck-Krala, E., & Klimkiewicz, K. (2017). Reward programs supporting environmental organizational policy. *Zarządzanie Zasobami Ludzkimi*, 6, 41–54.

Bombiak, E. (2019). Green Human Resource Management – the latest trend or strategic necessity? *Entrepreneurship and Sustainability Issues*, 6(4), 1647–1662. https://doi.org/10.9770/jesi.2019.6.4(7)

Bombiak, E. (2020a). Advances in the implementation of the model of sustainable Human Resource Management: Polish companies experience. *Entrepreneurship and Sustainability Issues*, 7(3), 1667–1687. https://doi. org/10.9770/jesi.2020.7.3(16) Bombiak, E. (2020b). *Nowe trendy w obszarze funkcji personalnej.* Wydawnictwo Naukowego Uniwersytetu w Siedlcach.

Bombiak, E., & Marciniuk-Kluska, A. (2018). Green Human Resource Management as a toolfor the sustainable development of enterprises: Polish young company experience. *Sustainability*, *10*(6), 1739. https://doi. org/10.3390/su10061739

Bugdol, M., & Stańczyk, I. (2021). Zielone zarządzanie ludźmi. Green HRM. Difin.

CISL. (n.d.). Leading with sustainable purpose: Leaders' insights for the development, alignment and integration of a sustainable corporate purpose. Cambridge Institute for Sustainability Leadership. Retrieved March 14, 2023, from https://www.cisl.cam.ac.uk/system/files/documents/ aligning-and-integrating.pdf

Dębkowska, K. (2017). E-logistics as an element of the business model maturity in enterprises of the TFL sector. *Procedia Engineering*, *182*, 143–148. https://doi. org/10.1016/j.proeng.2017.03.141

Dumont, J., Deng, X., & Shen, J. (2019). *Green Human Resource Management in Chinese Enterprises*. Routledge. https://doi.org/10.4324/9780429286971

Ehnert, I. A., Matthews, B., & Muller-Camen, M. (2020). Common good HRM: A paradigm shift in Sustainable HRM? *Human Resource Management Review*, *30*(3), 100705. https://doi.org/10.1016/j.hrmr.2019.100705

Ferdig, M. A. (2007). Sustainability leadership: Co-creating a sustainable future. *Journal of Change Management*, 7(1), 25–35. https://doi.org/10.1080/14697010701233809

Fertsch, M. (red.). (2016a). Logistyka. In Słownik terminologii logistycznej z indeksem angielsko-polskim i polskoangielskim (p. 89). Biblioteka Logistyka. Instytut Logistyki i Magazynowania.

Fertsch, M. (red.). (2016b). Spedycja. In *Słownik terminologii logistycznej z indeksem angielsko-polskim i polsko--angielskim* (p. 189). Biblioteka Logistyka. Instytut Logistyki i Magazynowania.

Fertsch, M. (red.). (2016c). Transport. In *Słownik terminologii logistycznej z indeksem angielsko-polskim i polsko--angielskim* (p. 218). Biblioteka Logistyka. Instytut Logistyki i Magazynowania.

Gofin. (n.d.). Sekcja H – Transport i Gospodarka Magazynowa. Retrieved February 28, 2022, from http://www. klasyfikacje.gofin.pl/pkd/5,1,1516,transport-i-gospodarka-magazynowa.html#sekcja

GUŠ. (n.d.). Pracujący w gospodarce narodowej wg sekcji PKD, płci i miejsca zamieszkania (dane miesięczne). Bank Danych Lokalnych. Retrieved February 1, 2022, from https://bdl.stat.gov.pl/bdl/metadane/cechy/szukaj?slowo =Pracuj%c4%85cy%20w%20gospodarce%20narodowej%2 0wg%20sekcji%20PKD

Hallinger, P., & Suriyankietkaew, S. (2018). Science mapping of the knowledge base on sustainable leader-ship, 1990–2018. *Sustainability, 10*(12), 4846. https://doi.org/10.3390/su10124846

Herman, A., Oleksyn, T., & Stańczyk, I. (Eds.). (2016). Zarządzanie respektujące wartości: raport z badań. Difin.

Iqbal, Q., & Ahmad, N. H. (2021). Sustainable development: The colors of sustainable leadership in learning organization. *Sustainable Development, 29*(1), 108–119. https://doi.org/10.1002/sd.2135

Jain, N., & D'lima, C. (2018). Green HRM – a study on the perception of Generation Y as perspective internal customers. *International Journal of Business Excellence*, *15*(2), 199–208. Janik, M. (2021, August 13). Zieleń zaczyna być kolorem biznesu. Polskie firmy wreszcie chcą być eko. *Rzeczpospolita.* https://klimat.rp.pl/walka-o-klimat/ art18708281-zielen-zaczyna-byc-kolorem-biznesu-polskie-firmy-wreszcie-chca-byc-eko

Kauf, S., Kramarz, M., & Sadowski, A. (2019). Zarządzanie marketingowo-logistyczne. Kontekst zrównoważonego rozwoju. Wydawnictwo Naukowe PWN.

Kolasińska-Morawska, K., & Sułkowski, Ł. (2022). Logistyka oczami kobiet. Difin.

Kozar, Ł. J. (2017). Shaping the green competence of employees in an economy aimed at sustainable development. *Zarządzanie Zasobami Ludzkimi*, 6(119), 55–67.

Kozar, Ł. J. (2019). Zielone miejsca pracy. Uwarunkowania – identyfikacja – oddziaływanie na lokalny rynek pracy. Wydawnictwo Uniwersytetu Łódzkiego.

Kozar, Ł. J., & Matuszewska-Kubicz A. (Eds.) (2022). Branża TSL wobec wyzwań zrównoważonego rozwoju – wybrane aspekty. Wydawnictwo Uniwersytetu Łódzkiego.

Krawczyk, S. (2020). *Podstawy logistyki* (ed. 2). CeDeWu. Lee, H.-W. (2017). Sustainable leadership: An empirical investigation of its effect on organizational effectiveness. *International Journal of Organization Theory and Behaviour*, 20(4), 419–453. https://doi.org/10.1108/IJOTB-20-04-2017-B001

Lulewicz-Sas, A., & Zubek, M. (2022). Teoria i praktyka zrównoważonego rozwoju. In A. Wojtczuk-Turek (Ed.), *Zarządzanie kapitałem ludzkim w warunkach zrównoważonego rozwoju* (pp. 13–38). Wydawnictwo Naukowe PWN.

Łabędzki, R. (2022). Zrównoważone zarządzanie kapitałem ludzkim i zielone ZKL – założenia koncepcji i stosowane w firmach praktyki. In A. Wojtczuk-Turek (Ed.), Zarządzanie kapitałem ludzkim w warunkach zrównoważonego rozwoju (pp. 39–56). Wydawnictwo Naukowe PWN.

Matejun, M., Matusiak, B. E., & Różańska-Bińczyk, I. (2020). Praktyki green HR a wyniki środowiskowe współczesnych przedsiębiorstw. In J. Cewińska, A. Krejner-Nowecka, & S. Winch (Eds.). *Zarządzanie kapitałem ludzkim* – wyzwania (pp. 61–76). Oficyna Wydawnicza SGH.

Matusiak, B. E., Matejun, M., & Różańska-Bińczyk, I. (2020). Koncepcja zrównoważonego rozwoju jako środowisko implementacji praktyk "green HR" we współczesnych przedsiębiorstwach. In M. Urbaniak, & A. Tomaszewski (Eds.). Wyzwania społeczne i technologiczne a nowe trendy w zarządzaniu współczesnymi organizacjami (pp. 111–124). Oficyna Wydawnicza SGH.

Muszyńska, W. (2021). Stosunek przedstawicieli pokolenia Y do inicjatyw z zakresu zielonego zarządzania zasobami ludzkimi. *Edukacja Ekonomistów i Menedżerów*, 60(2), 73–87. https://doi.org/10.33119/EEIM.2021.60.5

O'Donohue, W., & Torugsa, N. A. (2016). The moderating effect of 'Green'HRM on the association between proactive environmental management and financial performance in small firms. *International Journal of Human Resource Management*, 27(2), 239–261. https://doi. org/10.1080/09585192.2015.1063078

Opatha, H. H. D. P. J., & Kottawatta, H. (Eds). (2020). Green HRM, Green Attitude and Green Work Behavior of Employees: An Empirical Study in a Sri Lankan Tiles Manufacturing Company. *Proceedings of Undergraduate Research Symposium*, 1–8.

Paillé, P. (Ed.). (2022). *Green Human Resource Management research. Issues, trends, and challenges.* Palgrave Macmillan.

Peterlin, J., Pearse, N., & Dimovski, V. (2015). Strategic decision making for organizational sustainability: The

implications of servant leadership and sustainable leadership approaches. *Economic and Business Review*, *17*(3), 273–290. https://doi.org/10.15458/85451.4

Piwowar-Sulej, K. (2021a). Core functions of Sustainable Human Resource Management. A hybrid literature review with the use of H-Classic methodology. *Sustainable Development*, *29*(4), 671–693. https://doi.org/10.1002/sd.2166

Piwowar-Sulej, K. (2021b). The practice of Green HRM in Poland – with the focus on elements of the HR function. *Annales Universitatis Mariae Curie-Skłodowska*, 55(2), 75–84.

Piwowar-Sulej, K., Bąk-Grabowska, D., Grzesik, K., & Zając, Cz. (2023). Zrównoważone Zarządzanie Zasobami Ludzkimi – wybrane zagadnienia. Wydawnictwo Uniwersytetu Ekonomicznego we Wrocławiu.

Puls Biznesu. (2022, October 25). *W logistyce i łańcuchach dostaw rośnie znaczenie ESG.* https://www.pb.pl

Ren, S., Tang, G., & Jackson, S. E. (2018). Green Human Resource Management research in emergence: A review and future directions. *Asia Pacific Journal of Management*, *35*(3), 769–803. https://doi.org/10.1007/s10490-017-9532-1

Renwick, D. W. S. (Ed.). (2018). Contemporary developments in Green Human Resource Management research: Towards sustainability in action? Routledge. https://doi. org/10.4324/9781315768953

Renwick, D. W. S., Jabbour, C. J., Muller-Camen, M., Redman, T., & Wilkinson, A. (2015). Contemporary development in Green (environmental) HRM scholarship. *The International Journal of Human Resource Management*, *27*(2), 114–128. https://doi.org/10.1080/09585192.201 5.1105844

Renwick, D. W. S., Redman, T., & Maguire, S. (2012). Green Human Resource Management: a review and research agenda. *International Journal of Management Reviews*, *15*(1), 1–14. https://doi.org/10.1111/j.1468-2370.2011.00328.x

Różańska-Bińczyk, I. (2020, September 23). Green HRM – "zielone" zarządzanie zasobami ludzkimi. Sposób na zrównoważony rozwój firmy. https://ksiegowosc.infor. pl/zus-kadry/inne/4690505,Green-HRM-zielone-zarzadzanie-zasobami-ludzkimi-Sposob-na-zrownowazonyrozwoj-firmy.html

Różańska-Bińczyk, I., Matejun, M., & Matusiak, B. E. (2020). Praktyki green HR we współczesnych przedsiębiorstwach. In J. Cewińska, A. Krejner-Nowecka, & S. Winch (Eds.), *Zarządzanie kapitałem ludzkim – wyzwania* (pp. 77–91). Oficyna Wydawnicza SGH.

Safari, A., Salehzadeh, R., Panahi R., & Abolghasemian, S. (2018). Multiple pathways linking environmental knowledge and awareness to employees'green behavior. *Corporate Governance*, *18*(1), 81–103. https://doi. org/10.1108/CG-08-2016-0168

SGH. (2024). Sustainable HRM – An International Perspective. SGH Warsaw School of Economics. https://shrm.sgh. waw.pl/

10

.

Shah, M. (2019). Green Human Resource Management: Development of a valid measurement scale. *Business Strategy and the Environment*, *28*(5), 771–785. https://doi. org/10.1002/bse.2279

Shen, J., Dumont, J., & Deng, X. (2018). Employees' perceptions of Green HRM and non-green employee work outcomes: The social identity and stakeholders perspectives. *Group & Organization Management, 43*(4), 594–622. https://doi.org/10.1177/1059601116664610

Tundys, B., & Wiśniewski, T. (2018). The selected method and tools for performance measurement in the green supply chain – Survay analysis in Poland. *Sustainability*, *10*(2), 549. https://doi.org/10.3390/su10020549

Urbaniak, B. (2017). Colorful human resource management: what are we talking about? *Zarządzanie Zasobami Ludzkimi*, 6(119), 9–19.

Wagner, M. (2013). 'Green' human resource benefits: Do they matter as determinants of environmental management system implementation? *Journal Of Business Ethics*, *114*(3), 443–456. https://doi.org/10.1007/s10551-012-1356-9

Wielewska, I., Kacprzak, M., Król, A., Czech, A., Zuzek, D. K., Gralak, K., & Marks-Bielska, R. (2023). Green Human Resource Management. *Economics and Environment, 83*(4), 276–302. https://doi.org/10.34659/eis.2022.83.4.496

Witkowski, J. (2010). Zarządzanie łańcuchem dostaw. Koncepcje – procedury – doświadczenia (ed. 2). Polskie Wydawnictwo Ekonomiczne.

Wojtczuk-Turek, A. (Ed). (2022). Zarządzanie kapitałem ludzkim w warunkach zrównoważonego rozwoju. Wydawnictwo Naukowe PWN.

Yusoff, Y. M., Nejati, M., Kee, D. M. H., & Amran, A. (2020). Linking Green Human Resource Management practices to environmental performance in hotel industry. *Global Business Review*, *21*(3), 663–680. https://doi.org/10.1177/0972150918779294

Zaid, A. A., Bon, A. T., & Jaaron, A. A. (2020). Green Human Resource Management Bundle Practices and Sustainable Manufacturing Performance: Understanding Potential Relationship. *Proceedings of the International Conference on Industrial Engineering and Operations Management* (pp. 2945–2956). https://ieomsociety.org/ieom2020/ papers/668.pdf

Zaleśna, A., & Wyrzykowska, B. (2017). Zrównoważone zarządzanie zasobami ludzkimi w praktyce przedsiębiorstw w Polsce. *Organizacja i Kierowanie*, 1(175), 151–165.

Zoogah, D. B. (2011). The dynamics of Green HRM behaviors: A cognitive social information processing approach. *German Journal of Human Resource Management*, *25*(2), 117–139. https://doi.org/10.1177/23970022110 2500204

Zowada, K. (2020). Green Logistics: The way to environmental sustainability of logistics. Empirical evidence from Polish SMEs. *European Journal of Sustainable Development*, *9*(4), 231–240. https://doi.org/10.14207/ejsd.2020. v9n4p231

Alicja Winnicka-Wejs holds a postdoctoral degree in social sciences in the discipline of management and quality, working as a professor in the Department of Organizational Management at the University of Economics in Katowice. She is the author of several dozen publications in the field of human capital management. Her scientific and research interests focus on the issues of investing in human capital, the market of development services, management of an organisation's human capital quality and value, as well as personal marketing and personal risk. She is currently the manager of an interdisciplinary research project entitled "The role of an inclusive approach to building resilience of an organisation based on the example of the TFL sector".



Agnieszka
Golińska



Anna Kwiatkowska

Subjective well-being of sojourners and its determinants: evidence from Mexico

.

Abstract

This study aims to examine the predictors of the psychological adjustment of sojourners in Mexico, focusing on acculturation, individualistic and collectivistic values, contact and social interactions, language proficiency, and sociodemographic characteristics. The adjustment was operationalised as subjective well-being, measured as satisfaction and ill-being. The study focuses on international students, expats and retirees (N = 363, 66.7% women) having lived in Mexico between six months and 10 years (M = 3.38; SD = 2.67). The results of linear regression analyses show that age is the best predictor of the level of adjustment. The study sheds light on the predictors of sojourners' well-being in the specific and often overlooked context of migration to a collectivist country, i.e. Mexico.

Keywords: adjustment, well-being, acculturation, sojourners, Mexico

Introduction

With around 11 million citizens living abroad in 2020, Mexico is undoubtedly an emigration country (McAuliffe & Triandafyllidou, 2021), while the over 1 million immigrants made up only 0.8% of the total population of the country (United Nations, 2019). Interestingly, at the same time, Mexico was considered a tempting destination for sojourners, for example being ranked as the first most attractive destination for expats (InterNations, 2022). Over the past decades, there has been an increase in the number of foreigners (Organisation of America States, 2017), with the largest minority of people coming from South America, Central America and the Caribbean, followed by North America and Europe (Rodriguez Chavez & Cobo, 2012). Since 2011, residence for foreigners in Mexico has been regulated by the La Ley de Migración (Migration Act) (Canales & Rojas, 2018), with restrictive temporary and permanent residence regulations for those applying for a work permit, and a relatively long and costly process. As a result, sojourners in Mexico most often represent a high-status migrant group (Golińska, 2022; Golińska & Kwiatkowska, 2024), and tend to have better job opportunities and living conditions than many Mexicans, especially in the case of immigrants from the US (Meza-González & Orraca-Romano, 2022).

Considerable research has been devoted to understanding the acculturation of immigrants, refugees, and asylum seekers, who tend to be permanently settled in the host country (Schwartz et al., 2020). Sojourners, in turn, are people who decide to relocate to another country to achieve particular objectives and then return to their place of origin (Safdar & Berno, 2016). The three most significant and largest sojourner types are expatriates, international students and tourists, and despite some differences between these groups, their intercultural experiences are assumed to be time-bound, finite and voluntary (Safdar & Berno, 2016). Retirees can also be regarded as sojourners (Gustafson, 2001), since their migration is volitional, short-term, and for a specific time. Whereas the primary goal of immigrants and refugees is to improve their and their families' lives, sojourners mostly want to study, work or play, although in practice most of them will pursue a mix of these migration goals (Ward et al., 2001). As sojourners have particular migration goals and can count on institutional support prior to and/or upon

Agnieszka Golińska, SWPS University, Poland, D https://orcid.org/0000-0002-0284-7315 Anna Kwiatkowska, Institute of Psychology Polish Academy of Sciences, Poland, D https://orcid.org/0000-0002-5867-7079

.

10

arrival to the destination country, when compared to other groups, their adjustment to a new country may be influenced by other variables.

Acculturation and adjustment

Acculturation refers to migrating individuals' adoption of host-cultural practices, values, identifications and attitudes, and maintenance of those that were inherent in their countries of origin (Schwartz et al., 2020). The Relative Acculturation Extended Model (RAEM) (Navas et al., 2005) includes two dimensions: culture adoption and culture maintenance, in two acculturation planes: the real and the ideal. The first one refers to strategies applied, while the other one focuses on the preferences. In addition, the RAEM distinguishes eight acculturation domains, which can be grouped into public and private areas (López--Rodríguez et al., 2014; Navas Luque & Rojas Tejada, 2010).

According to Berry (2005), the long-term goal of acculturation is to achieve psychological and sociocultural adaptation, and it may affect a wide variety of outcomes, including mental health (see also Ward, 2001). The psychological adaptation refers to wellbeing and life satisfaction. Bak-Klimek and colleagues (2015) indicate that most of the scientific literature focuses on migrants' mental health and mental illness, while relatively little attention has been paid to the positive aspects of this process. While acculturation is most often studied in the context of stress and health problems, data shows that in many cases minorities have better mental health than the dominant culture society (Rudmin, 2009). However, the mechanisms behind the impact of acculturation on individual wellbeing are not fully explained (Buckingham & Suarez--Pedraza, 2019). In the following sections, we discuss some individual-level factors that can influence the subjective well-being (SWB) of sojourners.

Since the structure of SWB measures can be conceptualised as having a different number of facets (Pavot, 2018), we operationalised SWB as a positive attitude towards life, self-esteem, low levels of depressive mood, joy in life (satisfaction) and low frequency of experienced problems and somatic complaints (ill-being) (Grob, 1995). Although initially well-being and ill-being have been seen as opposite ends of a bipolar continuum, studies demonstrated that they are independent, and the absence of ill-being does not guarantee possessing high well-being (Ryff et al., 2006). Thus, measuring both provides a more fine-grained assessment.

Individualistic and collectivistic values

Cultural distance is one of the key variables in the process of adaptation of sojourners: the larger the differences between heritage and host culture, the more difficult the adaptation (e.g. Ward et al., 2001), which may be the case of the encounter between individualistic and collectivistic cultures (Kwiatkowska, 2019). In individualistic cultures, people perceive themselves as having a relatively separate identity, while in collectivist cultures the individual's identity relies heavily on belonging to a group. In individualistic cultures, it is the individual, their rights and needs that come first, while in collectivistic cultures, relationships with others (such as family or co-workers) are prioritised. Both individualistic and collectivistic values are present in each culture, yet their distribution varies. Therefore, we decided to measure the individualistic and collectivistic values on the individual level, rather than use country-level data.

Differences regarding individualism and collectivism can act as certain barriers to the acculturation process, especially if the functioning of individuals depends on cooperation and mutual understanding, as in the case of students and expats. For them, achieving the goals associated with the decision to migrate (e.g. graduation or career goals) is virtually impossible without effective communication.

Contact with the host society

Interactions between people from different social groups (Allport, 1954; Pettigrew & Tropp, 2006) can have beneficial effects on adaptation, depending on intergroup prejudice, its frequency and quality (Navas Luque & Rojas Tejada, 2010). Positive and/or frequent contact with the outgroup members should imply a desire of immigrants to participate in the host society and thus adopt their culture. In contrast, lack of contact and/or contact of a negative nature should be related to a low level of host culture adoption.

Age and gender

A variety of demographic factors have been examined in relation to acculturation and adjustment. Cheung and colleagues (2011) confirmed the sensitive period of acculturation hypothesis, according to which the younger the individuals at the time of immigration, the more rapidly they identify with the dominant culture. In addition, the longer the younger immigrants stayed in Canada, the stronger the identification with the new culture, while such results were not observed for older participants. However, acculturation research has often been limited to youth and adults, while when older migrants are considered, they are often combined with other adult migrants (Szabo, 2023).

Regarding gender, women tend to more often be isolated from the host culture than men, mainly due to lower employment opportunities and language skills needed for deeper immersion in the new culture, although some studies have failed to prove this relation or reported poorer adjustment in men (Ward et al., 2001). A meta-analysis by Yoon et al. (2013) showed a stronger positive correlation between the maintenance of the heritage culture and mental health for women when compared to men, although most of the studies analysed were conducted in the US and did not consider the cultural context as a variable.

The present study

The main aim of this study was to explore whether acculturation strategies and preferences in different areas of life (public vs. private), as well as individualistic and collectivistic values, contact with Mexicans and co-nationals, language proficiency, and sociodemographic variables were predictors of sojourners' adjustment.

The acculturation process is sensitive to the conditions in which it occurs. Patterns of acculturation and their outcomes are affected, among other factors, by the expectations and attitudes of the host society toward immigrants from different ethnic groups, with different socioeconomic status and diverse migration purposes (Schwartz et al., 2010), and they unfold in the ecological context at the family, institutional (workplace, education institutions) and societal level (Ward & Geeraert, 2016). Analyses involving various cultural groups in different countries allow us to better understand the process and create more precise theories. However, the research in social sciences, including management and quality sciences, is marked by an over-representation of the WEIRD countries (Western Educated Industrialised Rich Democratic), predominantly individualistic. In this study, Mexico was chosen as an example of a collectivist country, addressing the research gap in this respect.

Method

Participants

The participants were 363 sojourners (123 men and 240 women), aged 18-79 (M = 38.90; SD = 17.31), with a length of stay in Mexico between 6 months and 10 years (M = 3.38; SD = 2.67), and who declared a voluntary purpose of residence and settled immigration status. The respondents were from North America (n = 138), Europe (n = 99), Latin America (n = 94) and Asia (n = 32).

Procedure

The participants are a hard-to-reach group, which is why we used convenience and snowball sampling,

Table 1

Factor Structure of the Dyadic Adjustment for the RAEM Scale

recruiting respondents among the Facebook groups of expats in Mexico, international students, and via private contacts of sojourners. The respondents filled out an online survey in the language of their choice: English or Spanish. Unless they had been available in two languages from the start, all the questionnaires used in the study were translated using forward and backward translation.

Instruments

Subjective well-being

Subjective well-being was measured by the Berne Questionnaire on Subjective Well-Being, Adult form (BSW/A) (Grob, 1995), which consists of six scales measuring well-being in different domains: Positive Attitude toward Life (PA), Problems (PR), Somatic Complaints (SC), Self-Esteem (SE), Depressive Mood (DM) and Joy in Life (JL). We calculated two indicators: Satisfaction, based on the PA, SE, DM and JL subscales, and Ill-being, based on the PR and SC subscales, with the participants responding on a 5-point scale. We added two items regarding concerns about the political situation and security threat in Mexico. In total, the tool provided 39 items. Indicators were calculated based on the average of the responses to each item making up the scale. For the Satisfaction scale, $\alpha = 0.85$, while for Ill-being, $\alpha = 0.87$.

Acculturation

Participants' acculturation strategies and preferences were measured by the RAEM scale (Navas et al., 2005; Navas Luque & Rojas Tejada, 2010) adapted to the context of Mexico. Respondents answered two questions regarding the real plane (to what degree they maintain customs from their country of origin; to what degree they adopt the customs of Mexico) and two related to the ideal plane (to what degree would they like to maintain the customs of their country of origin; to what degree they would like to adopt customs of Mexico). For each question, they answered 6 or 8 items (domains) on a 5-point Likert scale: political and government system, social welfare system¹, consumer habits and family economy

Scale	Chi sqr	DF	р	CMIN/DF	RMSEA	LO 90	HI 90	CFI
Real Plane Maintain (RPM)	4.201	7	0.756	0.600	0.000	0.000	0.045	1.000
Real Plane Adopt (RPA)	16.603	7	0.020	2.372	0.062	0.023	0.100	0.983
Ideal Plane Maintain (IPM)	27.123	17	0.056	1.595	0.041	0.000	0.068	0.989
Ideal Plane Adopt (IPA)	42.974	17	0.000	2.528	0.065	0.041	0.089	0.974

Source: authors' own work.

.

¹ The domains of political and government systems, as well as social welfare systems, are included only for the ideal plane, since immigrants cannot practice the customs of their country of origin, nor reject the political system of the country in which they reside (real plane) (Navas Luque & Rojas Tejada, 2010).

(public areas); social relations, family relationships, religious beliefs, and customs and values (private areas). We used confirmatory factor analysis (CFA) in IBM SPSS Statistics Amos 26 to validate the two-factor solution with a distinction between public and private areas. Goodness-of-Fit statistics are presented in Table 1.

The internal consistency coefficients for the four scales were: RPM in public areas $\alpha = 0.56$, RPA in public areas $\alpha = 0.56$, RPA in public areas $\alpha = 0.58$, RPM in private areas $\alpha = 0.63$, RPA in private areas $\alpha = 0.75$, IPM in public areas $\alpha = 0.65$, IPA in public areas $\alpha = 0.71$, IPM in private areas $\alpha = 0.78$, IPA in private areas $\alpha = 0.78$. For the first two subscales, the α coefficients were relatively low, although considering the scales relying only on two items, we decided that this level of Cronbach's α a can be approved as sufficient. In addition, according to the standard minimum of Cronbach's α range at the level of 0.60–0.70, the above value may be regarded as sufficient in exploratory research (Nunnally & Bernstein, 1994).

Individualistic and collectivistic values

We used the Schwartz and Bilsky (1990) scale in the COLINDEX version proposed by Chan (1994) to measure individualistic and collectivist values, with a questionnaire consisting of 13 items representing individualistic (e.g. exciting life, independence; $\alpha = 0.75$) and collectivistic values (e.g. social order, obedience; $\alpha = 0.76$).

Contact variables

The participants were asked to estimate on a 4-point scale (*rarely*; *once a month*; *several times a month*; *several times a week*) how often they meet with people from three groups: from their country, other foreigners, and Mexicans.

The quality of contact variable was measured by the question *How would you rate the contact you have had or are having with Mexicans?* (answers on the 5-point scale) (Navas Luque & Rojas Tejeda, 2010).

The participants rated their proficiency in Spanish in terms of understanding, reading, speaking and writing on a 4-point scale. The coefficient was obtained as the mean of responses to the four items (Cronbach's $\alpha = 0.97$).

Based on the answers to questions about the country of origin and other countries of residence, a nominal variable was also created *a posteriori* to determine whether foreigners had other cross-cultural experiences before immigrating (*yes, no*).

We also asked about the respondents' length of stay in Mexico, gender and age.

Data analysis

We performed linear regression analyses using the hierarchical-input method. The assumptions of the regression analysis were met for all the cases, with the level of adjustment measured successively as satisfaction and ill-being. In both cases, predictors were entered as sets of variables in six steps: 1) acculturation strategies (real plane); 2) acculturation preferences (ideal plane); 3) individualistic and collectivistic values; 4) contact variables (frequency of contact with compatriots, foreigners and Mexicans, and quality of contact with Mexicans); 5) the length of stay in Mexico, Spanish language proficiency, and previous multicultural experiences; 6) gender and age. The *dummy coding* procedure was applied for nonquantitative variables. All the analyses were performed using SPSS statistical software.

Results

First, we calculated the means, standard deviations and correlations between the variables under study (Table 2).

Predictors of sojourners' satisfaction

Results of regression analysis for Satisfaction as a dependent variable are presented in Table 3. After the variables in the first step were entered, two variables were included in the model as statistically significant: RPA and RPM in private areas, F (4, 340) = 6.69; p < 0.001; explained together 6% of the variance.

In the second step, the RPM-private proved statistically significant *F* (8, 336) = 5.72; p < 0.001, with the RPM-public also becoming a statistically significant predictor, and the RPA-private ceasing to be one. These variables increased the level of explained variance by approximately 5% ($\Delta R^2 = 0.05$; p < 0.01) to a level of 10%.

In the third step, the level of individualistic values proved to be a statistically significant predictor, F (10, 334) = 8.41; p < 0.001, which increased the R² to 18% (Δ R2 = 0.08; p < 0.001) In step 3, the RPM-public ceased to be a statistically significant predictor (significance at the trend level), while another variable – IPM-public – proved to be a statistically significant predictor.

In step four, two variables were found to be predictors at the level of the statistical trend: frequency of contact with foreigners and quality of contact with Mexicans, *F* (14, 330) = 6.81; *p* < 0.001, with the R^2 in satisfaction increasing to 19% ($\Delta R^2 = 0.02$; *p* < 0.05). However, three variables of the RAEM were no longer statistically significant in the model (RPM-public, IPM-public, and IPM-private), while RPM-private became a predictor significant at the level of the statistical trend. Moreover, the collectivist values variable was a statistically significant predictor.

In step five, we introduced variables relating to the foreigners' stay in Mexico, yet none of these proved to be statistically significant predictors F(17, 327) = 5.67; p < 0.001. The model still explained 19% of the variance.

 Table 2

 Correlations between variables, means and standard deviations

Variable	-	5	~	4	L.	و	7	×	6	10	1	12	13	14	ť.	16	17	18	19	W	G
1. Age	1	0.130*	-0.297***	-0.088	-0.132*	-0.006	-0.318***	-0.423***	0.050	0.071	0.195***	-0.334***	-0.218***	-0.141**	0.046	0.066	-0.058	0.183***	-0.626***	38.9 1	7.31
2. Length of stay in Mexico	0.130*	1	-0.073	0.005	0.131*	-0.002	0.076	-0.085	-0.089	-0.059	-0.017	-0.017	0.045	-0.087	-0.173**	-0.154**	0.003	0.003	0.162**	3.38 2	2.67
3. Real maintain public	-0.297***	-0.073	I	0.445****	-0.053	-0.091	0.498****	0.340***	-0.027	-0.124*	0.113*	0.019	0.118*	0.101	0.161**	0.048	0.043	-0.028	0.227****	3.20 0	66.(
4. Real adopt public	-0.088	0.005	0.445***	I	0.130*	0.116*	0.188***	0.419***	0.141***	0.119*	0.205***	-0.089	0.067	0.205***	0.157**	0.198***	0.152**	0.051	0.108*	2.93 0	66.(
5. Real maintain private	-0.132*	0.131*	-0.053	0.130*	I	0.550****	-0.094	0.044	0.514***	0.452***	0.136**	-0.035	0.187***	0.095	-0.031	0.106*	0.139***	0.063	0.113*	3.48 0).85
6. Real adopt private	-0.006	-0.002	-0.091	0.116*	0.550***	I	-0.096	0.042	0.439***	0.692***	0.201***	-0.032	0.114*	0.173**	-0.056	0.051	0.118*	0.062	0.045	2.86 0	68.0
7. Ideal maintain public	-0.318***	0.076	0.498	0.188	-0.094	960.0-	I	0.458	-0.300	-0.178**	-0.083	0.191***	0.127*	0.116*	-0.057	-0.083	-0.101	-0.183***	0.303	3.20 0	.92
8. Ideal adopt public	-0.423***	-0.085	0.340****	0.419***	0.044	0.042	0.458****	I	-0.020	-0.036	0.018	0.159**	0.194***	0.351***	0.087	-0.017	0.027	-0.127*	0.352***	2.47 0	.84
9. Ideal maintain private	0.050	-0.089	-0.027	0.141**	0.514***	0.439***	-0.300***	-0.020	1	0.573***	0.229***	-0.169**	0.078	0.058	0.070	0.082	0.116*	0.136**	-0.110*	3.50 0	76.0
10. Ideal adopt private	0.071	-0.059	-0.124*	0.119*	0.452***	0.692***	-0.178	-0.036	0.573***	I	0.241***	-0.147**	0.110*	0.162**	0.040	0.141**	0.127*	0.113*	-0.092	2.99 0	16.0
11. Satisfaction	0.195***	-0.017	0.113*	0.205***	0.136**	0.201***	-0,083	0,018	0.229***	0.241***	1	-0.438***	0.262***	0.203***	0.134*	0.175**	0.144**	0.218***	-0.010	3.77 2	2.06
12. Ill-being	0334***	-0,017	0,019	-0.089	-0.035	-0.032	0.191***	0.159**	-0.169**	-0.147***	-0.438***	I	0.062	0.106^{*}	-0.059	-0.017	-0.077	-0.186***	0.218***	2.06 0).58
13. Values Ind	-0.218***	0,045	0.118^{*}	0.067	0.187***	0.114^{*}	0.127*	0.194***	0.078	0.110^{*}	0.262***	0.062	I	0.390****	0.013	0.017	0.147***	0.074	0.257***	4.04 0).53
14. Values Col	-0.141**	-0,087	0,101	0.205***	0.095	0.173**	0.116^{*}	0.351***	0.058	0.162**	0.203****	0.106^{*}	0.390****	I	0.068	0.037	0.040	-0.077	0.194***	3.88 0	.67
15. Frequency of contacts with co- nationals	0.046	-0.173**	0.161***	0.157***	-0.031	-0.056	-0.057	0.087	0.070	0.04	0.134*	-0.059	0.013	0.068	I	0.360****	0.158**	0.064	-0.147**	2.57 1	.19
16. Frequency of contacts with foreigners	0.066	-0.154**	0.048	0.198***	0.106*	0.051	-0.083	-0.017	0.082	0.141**	0.175**	-0.017	0.017	0.037	0.360****	I	0.288****	0.104*	-0.189***	2.75 1	90.1
17. Frequency of contacts with Mexicans	-0.058	0,003	0.043	0.152**	0.139**	0.118*	-0.101	0.027	0.116*	0.127*	0.144**	-0.077	0.147***	0.04	0.158**	0.288***	I	0.206****	0.004	3.55 0	69.(
18. Quality of contact with Mexicans	0.183***	0.003	-0.028	0.051	0.063	0.062	-0.183***	-0.127*	0.136**	0.113*	0.218****	-0.186****	0.074	-0.077	0.064	0.104*	0.206***	I	-0.069	4.40 0	.88
19. Spanish proficiency	-0.626***	0.162**	0.227***	0.108*	0.113*	0.045	0.303****	0.352***	-0.110*	-0.092	-0.01	0.218***	0.257****	0.194***	-0.147**	-0.189***	0.004	-0.069	I	2.83 1	1.10

Note. M – mean; SD – standard deviation; ${}^*p < 0.05$; ${}^{**}p < 0.01$; ${}^{**}p < 0.001$. *Source:* authors' own work.

Table 3

Regression analysis for the dependent variable Satisfaction

	Мос	lel 1	Мос	lel 2	Мос	lel 3	Мос	lel 4	Мос	iel 5	Мос	lel 6
Predictors	В	β	В	β	В	β	В	β	В	β	В	β
Constant	3.10		3.16		2.25		1.88		1.84		1.14	
RPM – public	0.03	0.05	0.07	0.14*	0.06	0.11t	0.05	0.10	0.05	0.11 ^t	0.08	0.16**
RPA – public	0.02	0.04	0.00	0.00	-0.02	-0.05	-0.03	-0.06	-0.04	-0.07	-0.01	-0.02
RPM – private	0.08	0.14*	0.07	0.13*	0.08	0.15*	0.06	0.11 ^t	0.05	0.10	0.03	0.05
RPA – private	0.09	0.17**	0.02	0.04	0.02	0.03	0.03	0.05	0.03	0.06	0.01	0.02
IPM – public			-0.07	-0.13 ^t	-0.07	-0.14*	-0.05	-0.10	-0.06	-0,11 ^t	-0.06	-0.11 ^t
IPM – public			0.02	0.03	0.03	0.05	0.03	0.05	0.03	0.06	0.03	0.05
IPM – private			-0.01	-0.02	-0.05	-0.10	-0.04	-0.09	-0.04	-0.07	0.00	0.01
IPA – private			0.10	0.20*	0.08	0.16*	0.07	0.13	0.07	0.13	0.08	0.14
Values Ind					0.22	0.25***	0.20	0.23***	0.20	0.22***	0.21	0.24***
Values Col					0.08	0.11 ^t	0.08	0.12*	0.09	0.12*	0.07	0.10 ^t
Frequency of contacts with co–nationals							0.01	0.03	0.01	0.04	0.01	0.02
Frequency of contact with foreigners							0.04	0.09 ^t	0.04	0.10 ^t	0.05	0.11*
Frequency of contact with Mexicans							0.01	0.02	0.01	0.02	0.03	0.05
Quality of contact with Mexicans							0.05	0.10 ^t	0.05	0.10 ^t	0.03	0.05
Length of stay									0.01	0.06	0.00	-0.02
Proficiency in Spanish									0.00	-0.01	0.09	0.20**
Cross–cultural experiences									0.01	0.01	0.00	0.00
Gender (0 = W; 1 = M)											-0.02	-0.02
Age											0.01	0.38***
R sqr Adj	0.	06	0.	10	0.	18	0.	19	0.	19	0.	25
F (df)	6.69 (4	,340)***	5.72 (8	,336)***	8.41 (10),334)***	6.81 (14	4,330)***	5.67 (17	7,327)***	7.11 (19	9,325)***
R sqr change	0.0	7***	0.0)5**	0.0	8***	0.0)2*	0.	00	0.0	7***

Note. ${}^{t} < 0.10$; ${}^{*}p < 0.05$; ${}^{**}p < 0.01$; ${}^{***}p < 0.001$. *Source:* authors' own work.

Lastly, we included demographic variables in the model; only the age of the participants proved to be a statistically significant predictor, *F* (19,325) = 7.11; p < 0.001. In model 6, the variables RPM-public and frequency of contact with foreigners, as well as Spanish language skills, again proved to be statistically significant predictors. The R² in satisfaction increased to 25% (Δ R² = 0.07; p < 0.001). It is worth noting that the collectivist values variable again became a predictor significant only at the level of the statistical trend, while the quality of contact with Mexicans ceased to be a statistically significant predictor altogether.

The strongest predictors of satisfaction among the variables entered in the final model were the age of the participants and the level of individualistic values. Conclusively, it can be assumed that the level of satisfaction increased with an increase in the maintenance of the culture of origin in the public spheres of life in the real plane, as well as with individualistic values, frequency of contact with foreigners, knowledge of the Spanish language, and age. Moreover, at the level of the statistical trend, the level of satisfaction went up with the increase in collectivist values, while it went down with an increase in maintaining the culture of origin in public spheres of life in the ideal plane.

Predictors of sojourners' ill-being

We then performed a regression analysis for ill-being as a dependent variable (Table 4), with the first model with acculturation strategy variables turning out not statistically significant, F(4, 340) = 0.67; p > 0.05. In the second step, three variables were found to be statistically significant predictors of acculturation preference: IPM-public, IPM private, and IPA- private, along with the RPM-private F(8, 336) = 4.19; p < 0.00; explaining 7% of the variance, $\Delta R^2 = 0.08; p < 0.001$). Subsequently, neither individualistic nor collectivistic values (step three) were statistically significant predictors of ill-being F(10, 334) = 3.63; p < 0.001.

In model 4, only the quality of contact with Mexicans proved to be a significant predictor at the level of statistical tendency, F(14, 330) = 2.95; p < 0.001. The model continued to explain 7% of the variance in ill-being.

In the fifth step, Spanish language skills proved to be a statistically significant predictor, F(17, 327) = 3.03; p < 0.001. Moreover, IPM-public was again found to be statistically significant, however only at the trend level.

Table 4

Regression analysis for the dependent variable Ill-being

Predictors	Мос	lel 1	Мос	lel 2	Мос	lel 3	Мос	lel 4	Model 5		Model 6	
Fiedictors	В	β	В	β	В	β	В	β	В	β	В	β
Constant	2.27		2.08		1.89		2.22		2.24		2.95	
RPM – public	0.03	0.05	-0.04	-0.06	-0.04	-0.06	-0.03	-0.05	-0.04	-0.07	-0.06	-0.11
RPA – public	-0.01	-0.02	0.02	0.03	0.02	0.03	0.02	0.03	0.01	0.01	-0.02	-0.03
RPM – private	-0.07	-0.11t	-0.09	-0.14*	-0.10	-0.14*	-0.09	-0.14*	-0.08	-0.12t	-0.06	-0.08
RPA – private	-0.01	-0.01	0.07	0.11	0.07	0.10	0.06	0.10	0.05	0.09	0.07	0.11
IPM – public			0.09	0.14*	0.09	0.14*	0.07	0.12	0.08	0. 12 ^t	0.07	0.11
IPM – public			-0.05	-0.07	-0.04	-0.06	-0.04	-0.06	-0.03	-0.05	-0.02	-0.03
IPM – private			0.09	0.14*	0.07	0.11 ^t	0.07	0.11 ^t	0,04	0.06	0.00	-0.01
IPA – private			-0.11	-0.17*	-0.11	-0.18*	-0.11	-0.17*	-0.10	-0.15 ^t	-0.10	-0.16*
Values Ind					-0.01	-0.01	0.01	0.01	0.00	0.00	0.00	0.00
Values Col					0.08	0.09	0.07	0.08	0.05	0.06	0.07	0.09
Frequency of contact with co–nationals							-0.02	-0.04	-0.02	-0.05	-0.02	-0.03
Frequency of contact with foreigners							0.03	0.06	0.05	0.09	0.04	007
Frequency of contact with Mexicans							-0.03	-0.04	-0.04	-0.05	-0.06	-0.07
Quality of contact with Mexicans							-0.06	-0.10 ^t	-0.06	-0.09 ^t	-0.04	-0.06
Length of stay									-0.01	-0.04	0.00	0.02
Proficiency in Spanish									0.08	0.15*	-0.01	-0.01
Cross–cultural experiences									-0.10	-0.08	-0.09	-0.08
Gender (0 = W; 1= M)											-0.06	-0.05
Age											-0.01	-0.31***
R sqr Adj	0.	00	0.	07	0.	07	0.	07	0.	09	0.	14
F (df)	0.97 (4,340)	4.19 (8	,336)***	3.63 (10	,334)***	2.95 (14	4,330)***	3.03 (17	7,327)***	3.83 (19	9,325)***
R sqr change	0.	01	0.0	8***	0.	01	0.	01	0.0)3*	0.0	5***

Note. ${}^{t} < 0.10$; ${}^{*}p < 0.05$; ${}^{**}p < 0.01$; ${}^{***}p < 0.001$. *Source:* authors' own work.
In addition, the RPM-private and IPA-private variables went from being statistically significant predictors to being predictors at the level of the statistical trend, while the IPM-private variable became a statistically insignificant predictor altogether. These changes increased the R^2 to 9% ($\Delta R^2 = 0.03$; p < 0.05).

.

.

In the last step, only the age of the participants, F(19, 325) = 3.83; p < 0.001 turned out to be a statistically significant predictor. It is worth noting that again the IPM-private variable became the statistically significant predictor, while the other variables of RAEM and quality of contact with Mexicans ceased to be statistically significant predictors. The R^2 in ill-being increased to a level of 14% ($\Delta R^2 = 0.05$; p < 0.001).

The age of the foreigners proved to be the strongest predictor among the variables entered into the final model. Ultimately, it can be assumed that the level of ill-being decreased with age, as well as with the increase in the adoption of Mexican culture in private spheres of life in the ideal plane.

Discussion

The aim of this study was to identify the factors that would explain the level of psychological adjustment of sojourners living in Mexico. The age of the participants was found to be the strongest predictor of their satisfaction and ill-being, with satisfaction levels increasing, and ill-being decreasing with age. Individualistic values, the proficiency level of the Spanish language, and the frequency of contact with other foreigners also proved to be important factors, and the satisfaction level increased together with the increase in the levels of these variables. Meanwhile, variables relating to the acculturation process itself were not significant predictors of adjustment, with two exceptions. The level of life satisfaction was positively determined by the maintenance of one's culture of origin in the public spheres of life in the real plane, whereas the level of ill-being decreased with the increase of the level of culture adoption in the private spheres of life in the ideal plane.

As far as younger people are concerned, the motivation behind their migration may play a key role, as they are mainly international fee-paying students, and their decision to leave their home country is primarily related to pursuing degree at a foreign university. Hence, for this group, academic performance is an important element in demonstrating their adaptation (Ward et al., 2001). It is also worth mentioning the relatively high financial costs of studying abroad. For the families of many students, allowing their children to pursue their education in Mexico is an expense that puts a significant strain on the family budget. Moreover, in Latin America (where most of the youngest participants come from), the decision regarding the choice of the study programme and the university itself is most often a family decision or one made only by the parents, and not individually by the future student. It also happens that relocation involves he whole family, e.g. when one of the parents takes a job abroad.

The factors described may add pressure affecting the level of students' well-being, and it is therefore presumed that students who wish to embrace the culture of Mexico may be interested in the new country and its culture. Perhaps they see the decision to move as their own and want to take full advantage of this time, not only in the immediate university-related area. For this reason, among the youngest participants with lower levels of ill-being, a higher level of preferred adoption of Mexican culture was recorded.

For middle-aged people, work-related challenges may have a similar effect to academic ones in the case of students. However, among expats, the decision to take up employment abroad tends to be more of an individual choice. Spiess and Wittman (1999) point out that sometimes decisions to deploy employees abroad are based on market indicators rather than an individual's career development strategy, which would also explain why the highest levels of adaptation were observed among the oldest participants. Firstly, the latter are rather seeking relaxation in Mexico as opposed to academic or professional challenges, and secondly, the decision to emigrate is usually their own. Finally, emotional experience seems to improve with age (Carstensen et al., 2000). As people get older, they are more likely to report highly positive emotional experiences to endure longer, and highly negative emotional experiences to fade more quickly. Age, however, was unrelated to the frequency of positive emotional experiences, and as a variable should be looked at more closely in further studies to better understand its predicting strength for the sojourner's adjustment.

An interesting result is that concerning the decrease of the ill-being level with age, and we cannot exclude the fact that the standard of living (cheaper accommodation and medical services) (Vázquez-Flores et al., 2024), but also the health of retirees is improving in Mexico. According to Expats Insider (InterNations, 2022), Mexico ranks second worldwide regarding the general cost of living, and fourth when it comes to housing costs, which, presumably, enables the participants to improve their standard of living compared to that in their own country. Quality of life and health may be factors of particular importance to retirees, as these are often closely linked to the choice of Mexico as an emigration destination. Sojourners are therefore able to make 'before and after departure' comparisons, and thus their reported levels of ill-being are the lowest among the groups in this study. After all, life satisfaction is the result of individual judgment, in which one compares given circumstances with what is considered to be a certain standard (Diener et al., 1999). Nevertheless, for this purpose further research, including qualitative methods, should be carried out to better understand the motivation of this specific and often overlooked group.

Finally, ill-being refers to declared somatic complaints (e.g. being ill and unable to work, having a very bad headache). Health conditions can be taken as an indicator of adjustment (Nguyen & Benet-Martínez, 2013) assuming that ailments occur due to ineffective adaptation, although in the case of students, sleeping

problems may be due to the academic load (e.g. 'allnight studying'). Similarly, headaches or stomach aches may be a reaction to stress closely related to university life (demanding study assignments, exams) and not necessarily to acculturation problems. Furnham and Bochner (1986) point out that international students face many challenges upon their arrival in a new country, only some of which are directly related to emigration. In addition, they must cope with the same problems as local students.

Interestingly, in this study, the acculturation variables did not turn out to be significant predictors of sojourners' satisfaction, and only the maintenance of the heritage culture in the private areas of life turned out to be a significant predictor of lower illbeing of the respondents. There is a possibility that acculturation processes may not play a key role in the adaptation of sojourners, because in general, they plan to return to their countries of origin in the nearest future (e.g. Safdar & Berno, 2016).

There are several noteworthy limitations of this research. Firstly, the group was heterogeneous in terms of the participants' nationality, although a recent meta-analysis of dispositional predictors of expatriate adjustment (Han et al., 2022) reveals that studies examining this group often focus on individuals originating from different countries. In the context of the adjustment index itself, it is also worth considering the introduction of alternative tools for measuring well-being, including those consisting of fewer items. The study would also benefit from the use of indicators of socio-cultural adjustment.

Finally, the sample covered sojourners, who are a very particular type of migrants, and in the case of Mexico are regarded as a high-status group. It can be assumed that different results would have been obtained if the participants had been immigrants or refugees, who in Mexico are a much more numerous group than sojourners. For that reason, it is important to consider the cultural context and be mindful when generalising the study findings.

References

Allport, G. W. (1954). *The nature of prejudice*. Addison-Wesley.

Bak-Klimek, A., Karatzias, T., Elliott, L., & Maclean, R. (2015). The determinants of well-being among international economic immigrants: A systematic literature review and meta-analysis. *Applied Research in Quality of Life*, *10*(1), 161–188. https://doi.org/10.1007/s11482-013-9297-8

Berry, J. W. (2005). Acculturation: Living successfully in two cultures. *International Journal of Intercultural Relations*, 29(6), 697–712. https://doi.org/10.1016/ j.ijintrel.2005.07.013

Buckingham, S. L., & Suarez-Pedraza, M. C. (2019). 'It has cost me a lot to adapt to here': The divergence of real acculturation from ideal acculturation impacts Latinx immigrants' psychosocial wellbeing. *American Journal of Orthopsychiatry*, 89(4), 406–419. https://doi.org/10.1037/ ort0000329

Canales, A., & Rojas, M. (2018). *Panorama de la migración internacional en México y Centroamérica* [Overview of international migration in Mexico and Central America]. CEPAL. https://www.cepal.org/es/publicaciones/43697-panorama-la-migracion-internacional-mexico-centroamerica

A 10 A 10

.

Carstensen L. L., Mayr, U., Pasupathi, M., & Nesselroade, J. R. (2000). Emotional experience in everyday life across the adult life span. *Journal of Personality and Social Psychology*, *79*(4), 644–655. https://doi.org/10.1037/0022-3514.79.4.644

Chan, D. K.-S. (1994). COLINDEX. A refinement of three collectivism measure. In U. Kim, H. Triandis, Kagitcibasi, S.-C. Choi, & G. Yoon (Eds.), *Individualism and collectivism. Theory, method, and applications* (pp. 200–210). SAGE Publications.

Cheung, B. Y., Chudek, M. & Heine, S. J. (2011). Evidence for a sensitive period for acculturation: Younger immigrants report acculturating at a faster rate. *Psychological Science*, 22(2), 147–152. https://doi.org/10.1177/0 956797610394661

Diener, E., Suh, E. M., Lucas, R. E., & Smith, H. L. (1999). Subjective well-being: Three decades of progress. *Psychological Bulletin*, *125*(2), 276–302. https://doi.org/10.1037/0033-2909.125.2.276

Furnham, A., & Bochner, S. (1986). *Culture shock: Psy-chological reactions to unfamiliar environments*. Methuen & Co. Ltd.

Golińska, A. (2022). Strategie i preferencje akulturacyjne studentów międzynarodowych w Meksyku. [Acculturation strategies and preferences of international students in Mexico]. *Psychologia Wychowawcza*, *67*(25), 43–65. https://doi.org/10.5604/01.3001.0016.2330

Golińska, A., & Kwiatkowska, A. (2024). Orientacje akulturacyjne Meksykanów w stosunku do migrantów pochodzących z USA, Francji, Polski, Hiszpanii, Korei Południowej i Ekwadoru [Acculturation orientations of Mexicans toward migrants from the USA, France, Poland, Spain, South Korea, and Ecuador]. *Studia Migracyjne – Przegląd Polonijny, 1*, 191. https://doi.org/10.4467/ 25444972SMPP.24.009.19679

Grob, A. (1995). Subjective well-being and significant life-events across the life span. *Swiss Journal of Psychology*, *54*(1), 3–18.

Gustafson, P. (2001). Retirement migration and transnational lifestyles. *Ageing and Society, 21(4)*, 371–394. https://doi.org/10.1017/S0144686X01008327

Han, Y., Sears, G. J., Darr, W. A., & Wang, Y. (2022). Facilitating cross-cultural adaptation: A meta-analytic review of dispositional predictors of expatriate adjustment. *Journal of Cross-Cultural Psychology*, *53*(9), 1054–1096. https://doi.org/10.1177/00220221221109559

InterNations. (2022). *Expat City Ranking 2022*. Internations GmbH.

Kwiatkowska, A. (2019). *Wielokulturowość w ujęciu interdyscyplinarnym [Multiculturalism in an Interdisciplinary Perspective]*. Wydawnictwo Naukowe PWN.

López-Rodríguez, L., Bottura, B., Navas, M., & Mancini, T. (2014). Acculturation strategies and attitudes in immigrant and host adolescents. The RAEM in different national contexts. *Psicologia Sociale*, *9*(2), 133–157. https:// doi.org/10.1482/77473

McAuliffe, M., & Triandafyllidou, A. (Eds.). (2021). *World Migration Report 2022*. International Organization for Migration (IOM).

Meza-Gonzailez, L., & Orraca-Romano, P. (2022). Anailisis del ingreso laboral de los joivenes estadouni-

denses en Meixico [Analysis of the labor income of young Americans in Mexico]. Migraciones Internacionales, 13. https://doi.org/10.33679/rmi.v1i1.2478

Navas, M., García, M. C., Sánchez, J., Rojas, A. J., Pumares, P., & Fernández, J. S. (2005). Relative Acculturation Extended Model (RAEM): New contributions with regard to the study of acculturation. International Journal of Intercultural Relations, 29(1), 21–37. https://doi. org/10.1016/j.ijintrel.2005.04.001

Navas Luque, M. & Rojas Tejada, A. J. (2010). Aplicación Del Modelo Ampliado de Aculturación Relativa (MAAR) a nuevos colectivos de inmigrantes en Andalucía: Rumanos y Ecuatorianos Application of the Relative Extended Acculturation Model (RAEM) to new immigrant Groups in Andalusia: Romanians and Ecuadorians]. Junta de Andalucía.

Nguyen, A. M. T. D., & Benet-Martínez, V. (2013). Biculturalism and adjustment: A meta-analysis. Journal of Cross-Cultural Psychology, 44(1), 122-159. https://doi. org/10.1177/0022022111435097

Nunnally, I. H., & Bernstein, I. (1994). Psychometric theory (3rd ed.). McGraw-Hill.

Organization of America States. (2017). International Migration in the Americas. Fourth Report of the Continuous Reporting System on International Migration in the Americas (SICREMI). OAS, OECD.

Pavot, W. (2018). The cornerstone of research on subjective well-being: Valid assessment methodology. In R. Diener, S. Oishi, & L. Tay (Eds.), Handbook of well-being (pp. 1–11). DEF Publishers.

Pettigrew, T. F., & Tropp, L. R. (2006). A meta-analytic test of intergroup contact theory. Journal of Personality and Social Psychology, 90(5), 751-783. https://doi. org/10.1037/0022-3514.90.5.751

Rodriguez Chavez, E., & Cobo, S. (2012). Extranjeros residentes en México. Una aproximación cuantitativa con base en los registros administrativos del INM [Foreign residents in Mexico: A quantitative approach based on administrative records from the INM]. Centro de Estudios Migratorios Instituto Centro de Estudios Migratorios, Instituto Nacional de Migración. https://doi. org/10.13140/2.1.1094.4801

Rudmin, F. (2009). Constructs, measurements and models of acculturation and acculturative stress. Inter-

.

. .

10

national Journal of Intercultural Relations. 33(2), 106–123. https://doi.org/10.1016/j.ijintrel.2008.12.001

Ryff, C. D., Dienberg Love, G., Urry, H. L., Muller, D., Rosenkranz, M. A., Friedman, E. M., Davidson, R. J., & Singer, B. (2006). Psychological well-being and ill-being: Do they have distinct or mirrored biological correlates? Psychotherapy and Psychosomatics, 75(2), 85–95. https://doi. org/10.1159/000090892

Safdar, S., & Berno, T. (2016). Sojourners. In D. L. Sam, & J. W. Berry (Eds.), The Cambridge handbook of acculturation psychology (pp. 173-196). Cambridge University Press.

Schwartz, S. H., & Bilsky, W. (1990). Toward a theory of the universal content and structure of values: Extensions and cross-cultural replications. *Journal of Person*ality and Social Psychology, 58(5), 878-891. https://doi. org/10.1037/0022-3514.58.5.878

Schwartz, S. J., Unger, J. B., Zamboanga, B. L., & Szapocznik, J. (2010). Rethinking the concept of acculturation: Implications for theory and research. American Psychologist, 65(4), 237-251. https://doi.org/10.1037/a0019330

Schwartz, S. J., Walsh, S. D., Ward, C., Tartakovsky, E., Weisskirch, R. S., Vedder, P., Makarova, E., Bardi, A., Birman, D., Oppedal, B., Benish-Weisman, M., Lorenzo-Blanco, E., Güngör, D., Stevens, G., Benet-Martínez, V., Titzmann, P. F., Silbereisen, R. K., & Geeraert N. (2020). The role of psychologists in international migration research: Complementing other expertise and an interdisciplinary way forward. Migration Studies, 10(2), 356-373. https://doi.org/10.1093/migration/mnz054

Spiess, E., & Wittmann, A. (1999). Motivational phases associated with the foreign placement of managerial candidates: An application of the Rubicon model of action phases. International Journal of Human Resource Management, 10(5), 891-905. https://doi.org/10.1080/09 5851999340215

Szabo, A. (2023). Growing old in adopted lands: The nexus of ageing and acculturation research. Online Readings in Psychology and Culture, 8(2). https://doi. org/10.9707/2307-0919.1180

United Nations. (2019). Trends in International Migrant Stock: The 2015 Revision. United Nations, Department of Economic and Social Affairs.

The full list of references is available in the online version of the journal.

. Agnieszka Golińska is an assistant professor at the Faculty of Social Sciences at SWPS University and Head of the Management and Leadership II degree program. For several years, she lectured and conducted research at Tecnologico de Monterrey in Mexico. Her research areas include organisational behaviour, diversity and inclusion, and cross-cultural management. She is interested in acculturation of international professionals, multiculturalism in the workplace, and the acculturation expectations of the host society. She has participated in research projects in Poland, Mexico, the United Kingdom, and the United States.

Anna Kwiatkowska is a professor at the Institute of Psychology Polish Academy of Sciences, where she works as the Head of the Cultural Psychology and Cross-cultural Research Laboratory. Her research areas include social psychology, cross-cultural and cultural psychology, and environmental psychology. She explores psychological and social processes from both a gender perspective (such as identity problems of immigrant women), and a cross-cultural perspective (including acculturation, cultural identity, aggression, interpersonal violence, deception, coping with stress, pro-environmental attitudes, etc.). She is the author of numerous papers published in international journals, chapters, and monographs, such as Wielokulturowość w ujęciu interdyscyplinarnym (2019); The small and big deceptions: in psychology and evolutional science perspectives (2015) with A. Łukasik, Mężczyzna polski: psychospołeczne czynniki warunkujące pełnienie ról zawodowych i rodzinnych (2006), with A. Nowakowska.

. . . .



Monika Szczerbak



Paweł Dec

Managing selected types of costs related to ESG implementation in enterprises

Abstract

In the current global business environment, the key factor influencing the success and sustainability of enterprises are the ESG assumptions, which aim to take into account environmental, social, and governance aspects in the decision-making process and when conducting business activities. This concept is not only gaining in importance but also penetrates deeply into an organisation's strategy, defining how companies should manage resources, product quality, and their impact on the surrounding world. Authors show how ESG is becoming an integral part of enterprise management, especially with respect to quality and environmental protection cost management. They focus on specific Lean Accounting tools and integrated quality and environmental cost accounting that can be used when implementing ESG assumptions. The proposed solutions result in a reduction in the use of raw materials and other resources, which is beneficial both for the planet and the company's financial results.

Keywords: ESG, enterprise value, cost management, quality costs, environmental protection costs, integrated quality, and environmental protection cost accounting

Introduction

Keeping up with the pace, meeting and often exceeding customer requirements, and at the same time pressure to reduce costs without affecting the quality of the products offered or services provided, and environmental protection are just some of the variables forcing enenterprises to search for increasingly sophisticated, holistic management strategies, including the implementation of environmental management and quality best practices. In such economic conditions, the concept of environmental, social, and governance (ESG) assumptions becomes more important and assumes consideration of environmental and social aspects and management in making decisions and running a business. Within the ESG assumptions, the costs of quality and environmental protection are important factors influencing a company's strategy. Their detailed verification and monitoring can more accurately reflect the risk facing the business on the one hand, and on the other hand identify costs in many areas. It can integrate environmental, quality, and social data in a financially relevant way. Traditional financial accounting allows stakeholders to evaluate the company's activities, but without taking into account the impact of environmental, qualitative, and social factors, the picture is incomplete. Efforts to achieve a greater balance between financial reporting and environmental and quality reporting have become increasingly important in recent years.

The aim of this article is to describe the impact of the ESG concept on cost management in enterprises, including quality and environmental protection costs, as well as the benefits resulting from applying this concept. The subject of the research includes quality costs, environmental protection costs, and tools aimed at their reduction and improvement of financial results. An attempt was made to show the benefits that a company can achieve by utilising the model of integrated accounting for quality and environmental protection costs, using a service enterprise as an example.

A critical analysis of the literature on quality management, environmental protection, and accounting was conducted. This analysis covered both classical approaches to these issues and the latest publications that take into account trends related to the increasing importance of ESG in corporate management. Induction methods were used, which involve drawing general conclusions from the observation of a specific case, as well as

Monika Szczerbak, Military University of Technology in Warsaw, Poland, D https://orcid.org/0000-0001-8073-7122 Paweł Dec, Warsaw School of Economics, Poland, D https://orcid.org/0000-0001-8460-2591

A 44 A 44

deduction, which meant that recommendations could be formulated based on existing theories.

The research adopted a case study approach, enabling an in-depth analysis of the service enterprise, allowing a detailed examination of the implementation of the integrated accounting model for quality and environmental protection costs in practice, in order to demonstrate how it improves operational efficiency, cost transparency, and the company's sustainable development. The study aimed to identify the benefits that a company can obtain through the implementation of this model, such as cost optimisation, better management of environmental risks, enhanced service quality, and increased competitiveness in the market.

The essence and importance of the ESG concept

The concept of ESG assumptions is becoming increasingly important and has developed in response to global challenges such as climate change, social inequality, and the need for more responsible corporate management. This trend is intensified by growing environmental pressure, including changing expectations of investors and the financial sector, legislative changes, growing social awareness, and the resulting fear of deterioration of the company's image. Introduction of 17 Sustainable Development Goals (SDGs) and 169 related actions to be achieved by all parties - state governments, international organisations, non-governmental organisations, science and business sectors, as well as citizens, which focus on the five Ps: people, planet, prosperity, peace, and partnership, not only increased interest in the ESG concept but also gave investors an additional tool in the form of sustainable financing (Biermann et al., 2017). Interest in products such as green or blue bonds has increased significantly (Flammer, 2021). The ESG approach focuses on all market participants actively contributing to positive changes in society and the environment. ESG is an important factor taken into account when making business decisions in many enterprises around the world (Whelan et al., 2020). More and more investors choose to invest in companies that consistently implement ESG principles (Johnson, 2020). Currently, these are the aspects to which companies that care about their reputation in the eyes of customers and investors, for whom sustainable development policy plays an increasingly important role, should pay attention. On this basis, investors often choose companies that correspond to their values (van Duuren et al., 2016). Environmental issues such as energy consumption, waste management, pollutant emissions, testing products on animals, compliance with government environmental regulations, social factors, and corporate policy are important and increasingly publicised today (Velte, 2017).

Bofinger et al. (2022) identify several key areas of emphasis in the area of corporate social responsibility, including employee relations, working conditions, organisational diversity, human rights, employee equality

and justice, product liability, and community health and safety. Corporate governance, as one of the three pillars of the ESG concept, is an integral part of the way companies are managed, controlled, and reported. It focuses on governance structure, transparency, business ethics, the board of directors, and relationships with shareholders. It is the company's internal supervision system. It consists of procedures, standards, and control mechanisms implemented to ensure effective management, improve decision-making processes, and comply with legal regulations, taking into account the needs of external stakeholders, in particular investors (Khan, 2019; Zhang et al., 2021). Virtually every entity needs efficient corporate governance rules adequate to its size, individual conditions, and strategic goals. Gyönyörová et al. (2021) point out that this ESG pillar assesses the way a company's management exercises control and supervision over organisational allocation, and whether companies' decisions are ethical, environmentally conscious, and forward-thinking. It examines the functions and role of the board of directors, remuneration policy, lobbying activities, corruption, donations, and strategic goals and approaches (Gyönyörová et al., 2021). Lee and Isa (2023) find that companies that follow ESG principles have stronger governance and care more about the company, the environment, and sustainability. They have less variable income and access to lower financing costs (Lee & Isa, 2023).

As a subject of scientific discussion and practical activities, ESG has become particularly important in the last few years. Many authors present definitions and meanings of this concept. According to Amel-Zadeh and Serafeim, ESG means implementing environmental, social, and corporate governance in enterprises and changing the way enterprises can be analysed and assessed (Amel-Zadeh & Serafeim, 2018). Rau and Yu (2024) define ESG as going beyond financial issues in the assessment of companies and the need to measure, report, and improve performance relating to environmental footprint, social impact, and governance. Rau and Yu show that the ESG approach requires investors to prefer projects that help to solve global environmental and social challenges or do not exacerbate existing problems. Wróbel and Kowalski (2022) analyse the definition of ESG in the context of the market position of enterprises, indicating that the application of ESG principles applies not only to investors but also to enterprises that try to improve their environmental, social, and management indicators to strengthen their competitive position. Inderst and Stewart (2018) say that ESG is a term that describes a company's responsibility to advance well-being and provide stakeholders with equitable and sustainable long-term wealth. They also state that investors, lenders, and other sources of capital use ESG to evaluate the ethical and sustainable business practices of borrowers.

The presented definitions complement each other and all highlight the importance of environmental, social, and governance factors in shaping sustainable business activities, which mutually interact and support the overall sustainability of the enterprise.

Pro-environmental actions such as reducing greenhouse gas emissions, efficient resource management, and the introduction of sustainable technologies not only minimise the company's impact on the environment but also improve its reputation in the eyes of customers, investors, and business partners. This, in turn, leads to better relationships with communities, who view the company as an entity committed to the common good, engaging in efforts to improve quality of life, supporting diversity and inclusivity, and providing appropriate working conditions for its employees. Such a socially responsible approach not only builds loyalty but also promotes the implementation of further ecological and social initiatives, thanks to greater employee engagement, as they feel they are working for a company guided by higher values. Strong governance structures, based on transparency, accountability, and corporate ethics, play a key role here, ensuring that the company's decisions comply with legal regulations and meet stakeholder expectations. Good governance also helps to minimise regulatory and financial risks, making the company better prepared for market and social changes. In this way, all ESG elements work together, contributing to the company's long-term success, improving its financial performance, and increasing its resilience to external fluctuations, ultimately leading to the development of a stable and sustainable organisation that enjoys the trust and support of a wide range of stakeholders.

ESG reporting – disclosure of non-financial information

ESG reporting is one of the elements of the management process. Recognising the value that comes from integrating ESG factors into key business processes by the company's management and understanding the need to assume responsibility for its actions, also in the social and environmental areas, is of fundamental importance for building a more sustainable business model. According to Ackah and Lamptey (2017), the use of ESG reporting is perceived as a management instrument that facilitates the restoration of credibility and trust and reflects the process of continuous improvement of the company. Krzysztofik and others (2021) emphasise that the information included in the ESG report should be relevant, objective and balanced, clear and concise, comparable and reliable, strategic and forward-looking, and verifiable. Presenting clearly and comprehensibly how an organisation incorporates ESG issues into its strategy and business activities is the basis for effective ESG communication.

ESG reporting in the EU has been mandatory for the largest entities since 2017 under the Non-Financial Reporting Directive (European Union, 2014). Under this directive, large public interest entities, (listed companies and financial institutions employing over 500 employees and meeting one of two criteria – balance sheet total greater than EUR 20 million and net sales revenues greater than EUR 40 million) are required to submit non-financial information every year, such as: • description of the business model;

.

- description of policies and their results regarding environmental, social, and labour issues, regarding human rights and counteracting corruption and bribery (Dec & Wysocki, 2022);
- description of significant types of risk (and due diligence procedures) concerning the above issues;
- key performance indicators (KPIs).

Entities subject to this obligation submit non-financial information (information on ESG factors) in a report on activities or in a separate report containing non-financial information. In December 2022, a new Directive on Corporate Sustainability Reporting (European Union, 2022) was enacted. Other important legal acts regarding ESG issues are the Regulation of the European Parliament and of the Council on establishing of a framework to facilitate sustainable investments - EU Taxonomy Regulation (European Union, 2020) and the Sustainable Finance Disclosure Regulation (SFDR) (EU) 2019/2088 of the European Parliament and the Council in on the disclosure of information related to sustainable development in the financial services sector European Union, 2019). The EU Taxonomy Regulation aims to support investors in making investment decisions. The main environmental objectives under this regulation are:

- climate change mitigation;
- adaptation to climate change;
- sustainable use and protection of water and marine resources;
- transition to a circular economy;
- pollution prevention and control;
- protection and restoration of biodiversity and ecosystems.

A business must meet four requirements to qualify for the EU taxonomy framework (European Union, 2020):

- Significant Contribution to at least one of the above six environmental purposes;
- DNSH Do No Significant Harm rule;
- compliance with technical selection criteria (established by delegated acts);
- compliance with minimum social security guarantees and management.

The CSRD modernises and strengthens the rules on social and environmental information that companies must publish. The publication obligation covers a wider range of large companies, as well as small companies listed on stock exchanges and medium-sized enterprises – SMEs (approximately 50,000 companies in total in the EU). The new rules aim to ensure that investors and other interested parties have access to the information needed to assess investment risks arising from climate change and other sustainability issues. The current scope of ESG reporting specified in the NFRD directive will be expanded to include the need to provide data such as the degree of compliance of the company's activities with the six environmental objectives of the EU taxonomy. Concerning large companies that are public interest

entities, as defined in the NFRD, there is an obligation to disclose whether and to what extent their business activities are consistent with the assumptions of the taxonomy. Companies are also required to determine the percentage of turnover, investments (CAPEX), and expenses (OPEX) in a given reporting year concerning assets or processes contributing to the achievement of the objectives specified in the taxonomy (Krzysztofik, 2021). At the core of ESG, the assumption made when investing is the pursuit of value creation over time, sustainable development, and a positive impact on the environment and society, and not short-term profitability as in the past. There will be a requirement for mandatory verification of disclosed ESG information by a statutory auditor or another authorised entity and an obligation to present the disclosed information in a structured electronic format for ease of presentation and comparison. A description of the business model and the ESG management system is necessary to understand whether and to what extent the company is prepared to respond to sustainable development challenges and opportunities (Maniora, 2017).

.

Including environmental and social risks in the overall risk management process helps embed ESG considerations more deeply into a company's operations and strategic business decisions. It is important to take into account both the risks within one's own business and in the supply chain. Implementing due diligence procedures concerning areas that may have a negative impact on sustainable development factors is an effective tool for mitigating potential and actual types of risk. Environmental indicators concern a company's impact on the natural environment and, depending on the nature of the business, some companies may have a significant impact on natural resources. The lack of appropriate management systems in these areas may result in increased regulatory risk or loss of reputation and opposition from local communities.

Environmental issues can cause operational disruptions, financial penalties, and challenges in maintaining stakeholder trust and sustainability compliance. Appropriate management of hazardous waste and measures to reduce waste production, reuse, and recycling is particularly important for companies whose activities involve significant waste generation. The lack of an appropriate management system may have negative consequences in the form of financial penalties or harm to image. Waste management is a series of activities aimed at monitoring, managing, and reducing waste (including reuse or recycling) produced within an enterprise. The quality of corporate governance is demonstrated by factors such as professional management staff, the structure of the management board and supervisory board, and a well-organised management system. Good corporate governance reduces the risks the company faces and is intended to ensure that key decisions are made in the interests of the company and its shareholders.

The ESG report is currently the preferred type of non-financial report, which is the culmination of the

process during which a company analyses its activities, shares results, and sets new goals. The report is an important communication tool between the company and its stakeholders, e.g. investors, business partners, customers, or the state. The concept of ESG is related to the idea of corporate social responsibility (CSR), which also includes the entity's impact on social and environmental issues. The main difference lies in the regulatory context. The definition of CSR indicates that an enterprise voluntarily takes into account interests other than its own, while ESG translates into a change in entrepreneurial practice because it is intertwined with legal requirements that are intended to make it mandatory to take care of the social interest. A study conducted on a sample of companies listed on the Warsaw Stock Exchange showed that the introduction by the EU of the ESG reporting obligation contributed in particular to the environmental and social responsibility measures taken by listed companies (Aluchna et al., 2023). Traditionally, ESG issues have been seen as a way to reduce risk and fully comply with best sustainable practices in companies (Firlej, 2018; Zukowska et al., 2016). The introduction of regulations and the obligation to report and present ESG results ensures a consistent methodological approach to climate-related risk management and helps companies avoid problems related to social changes. In this context, sustainable development is not only perceived as a market requirement but also as a factor in strengthening competitive advantage (Kolasiński, 2023).

Cost management in the context of ESG

The primary goal of cost management is to increase financial results and value for stakeholders, especially the value of the enterprise for owners and value for customers. This goal is achieved by increasing the effectiveness and efficiency of the resources used, which consequently helps to reduce costs. This improvement is facilitated by the use of appropriate cost management techniques, methods, and tools in various areas of the company's operations. The essence of cost management in an enterprise is accurately reflected in the definition framed by Van-Derbeck, who defined cost management as a set of techniques and methods for controlling activities and improving company processes and products. In this concept, managers are focused on optimal allocation of all resources owned by the enterprise and using them more efficiently (Nowak, 2015; VanDerbeck, 2013). According to the authors, the concept of cost management should be understood as measures taken by managers intentionally, aimed at continuous analysis of the level and structure of costs in all areas of the company's activity, to put its human, material, financial and information resources to more efficient use. Importantly, for these activities to be effective, managers need to obtain reliable, useful information with specific qualitative features (Szczerbak, 2022; Wysocki & Dec, 2021).

.

.

New development paradigms, ESG, global changes in the economy, and technological development have resulted in a new environment requiring entrepreneurs to use modern management tools in the management process, including Lean Accounting tools such as target costing, product life cycle accounting, the cost reduction account (Kaizen costing), value stream cost and results account, cost account of product features and characteristics and activity-based costing (Sobańska, 2010). The above-mentioned Lean Accounting tools create a cost accounting system integrated with the production system and management system based on lean enterprise principles. Comprehensive implementation of Lean Accounting methods, while applying the principles of the Lean approach in management systems, improves the quality of information and increases customer value at both the strategic and operational levels, thus enabling the implementation of strategic goals. Lean Accounting provides new tools for measuring not only the profitability of the value stream. These tools ensure maintaining the required process control in the future, and are an integral part of the comprehensive implementation of the Lean approach in the organisation. They also serve to motivate employees to continuously improve processes, understand the value created for the customer, and analyse financial results achieved due to the use of lean management methods. The overarching principle of Lean Accounting in generating and communicating financial and non-financial information is the concept of the product flow path adopted in the production and management processes. Hence, the main object of cost measurement in LA is the value stream of a product group, and not every product is included in such a group.

In Lean Accounting, information about the unit cost of a product created in the management accounting system of traditionally managed enterprises is eliminated, as is thinking about cost reduction in the short term. The unsuitability of this information results from the fact that in the Lean approach, sales prices are estimated based on the product value, and not on unit cost, - minimum inventories in the JIT or Kanban system are valued based on information about product costs determined using methods that are less complicated than standard cost accounting, - the optimisation criterion in accept or reject, buy or produce in-house decisions is the profitability of the value stream, not individual products; the effects of eliminating waste and the process of continuous improvement from top to bottom must be assessed on an ongoing basis, and not after a month (analysis of deviations in standard cost accounting) (Ofileanu & Topor, 2014).

Lean Accounting tools are designed to deliver real value in lean environments, contributing to improved resource management, better cost management, and more effective decision-making. Due to the increased focus on the efficiency of the raw materials and materials used, waste minimisation, and energy efficiency, Lean Accounting tools enable the identification and management of costs related to environmental protection. Lean Accounting also highlights the costs of quality by focusing on preventing defects and improving the quality of products or services. Lean Accounting also supports social aspects by increasing work efficiency and creating better conditions for employees, which translates into improved quality of life (Chanegrih & Creusier, 2016). Lean Accounting tools not only help identify and control quality and environmental costs, but also support efforts to achieve sustainable development and meet ESG criteria by focusing on efficiency, eliminating waste, and improving quality, which is consistent with the ESG philosophy.

Quality costs

.

The need to meet increasing quality requirements in the context of ESG results in new tasks for the company. Its management is forced to exercise the highest management diligence with regard to quality. Activities in this regard are aimed not only at searching for ways to optimise costs. Above all, it is necessary to know the amount of costs and the basic relationships between them. Quality costs are not a precisely and clearly defined concept. As Ciechan-Kujawa (2005) points out, this is due to differences in the approach to quality and the fact that in companies the areas of activities related to quality and other processes interpenetrate. For quality management experts, quality costs are an element, a separate part of an entity's own production costs, which can be a resource used to reduce total production costs. For economists, quality costs may mean the sum of costs incurred to produce a specific product of a specific quality that meets the customer's requirements and expectations (Balon, 2006). Quality costs are also defined as all expenses aimed at maintaining, ensuring, and improving the level of quality of products and services that is expected by the customer or agreed with the customer in binding fashion (Fajczak-Kowalska, 2004).

Petrus (2019) emphasises that the philosophy of comprehensive quality management aims at the most effective use of all the resources of a given organisation to achieve its goals. Separate records of quality costs help the organisation control and optimise costs related to the quality of products or services provided. This is important not only from a financial perspective but also under ESG principles, which emphasise the importance of quality, safety, and regulatory compliance. Therefore, companies should consider recording quality costs separately in accounting records as an element of effective management.

One way to confirm that the organisation meets high-quality requirements is to hold a certificate of compliance with the PN-EN ISO 9001:2015 standard. This certificate improves the company's image and confirms that the organisation operates correctly in terms of international standards. More importantly, it confirms the practical implementation of principles related to management culture in the organisation. This standard aims to ensure the stability and repeat-

. . .

ability of processes conducted in the organisation. Its universality lies in the fact that the written rules of conduct will be appropriate for an organisation offering services and an organisation whose main process is the production process.

.

Information on quality costs undoubtedly has a major impact on decision-making processes. However, with economic development, the demand for information among internal and external stakeholders in the implementation of the company's environmental activities also increases. For a modern enterprise, an important area of cost management is not only quality cost management but also environmental protection cost management. The link between this and meeting customer expectations and needs is unquestionable.

Karmańska (2007) and Sadkowski (2020) emphasise that the more detailed the classification of costs, the greater the potential for minimising waste, optimising resource management, and achieving better financial results. Information about environmental costs is important for internal recipients in terms of future measures to reduce these costs and knowledge of the impact of the business on the quality of the surrounding environment. This data also serves the company's external needs. Dobija and Kucharczyk (2014) point out that environmental protection should be a central part of a company's strategic policy. Those companies that use Lean Accounting tools such as continuous improvement accounting, Poka-Yoke product life cycle accounting, TPM, JiT, Kanban, and others can achieve better financial results, a more positive impact on the environment, and more favourable social effects.

Environmental protection costs

Due to the rapid development of the concept of environmental costs, there are many approaches and definitions in the literature. The costs of environmental protection may be expressed in pecuniary terms – the deliberate use of material resources, labour, and external services, due to which ecological balance is maintained (optimal state of the environment with the possibility of self-cleaning) (Stępień, 2002). In practice, environmental costs usually include various categories of costs related to environmental management, environmental protection activities, and environmental impacts (Małecki & Urbaniec 2014, p. 90).

At the enterprise level, external environmental costs can be defined as pollution caused by enterprises that has not been internalised, reduced, eliminated, or processed, and as a result has not yet been included in the economic calculation of the perpetrator's enterprise, but is a burden borne by others in the form of material or intangible costs (Seidel, 2005, p. 364). According to Szadziewska, the category of environmental costs at the enterprise level should include (2014):

current costs of environmental protection

 costs of operation and maintenance of activities aimed primarily at preventing, neutralising, reducing or eliminating pollution and other

impacts on the environment, and fees and purchase of environmental services aimed at reducing the negative impact on the environment;

- costs incurred for environmental protection projects, which constitute the sum of financial outlays on pollution prevention and neutralisation;
- internalised external costs ecological fees and taxes, including emissions trading fees for substance emission permits, including integrated permits.

Broadly speaking, the costs of environmental protection can be defined as the equivalent of the sum of the most valuable other economic and social benefits that must be foregone in exchange for taking protective measures (Górka et al., 2001, p. 196).

The definitions presented have common areas, which include inclusion in environmental costs of resource use, pollution prevention, and restitution. As interest in quality and environmental protection costs has increased, various cost categorisations have emerged, the types of which overlap in the structure, and new elements used for division have appeared, such as the costs of lost benefits and the so-called hidden cost estimates. The most important criterion for the division of costs related to quality or environmental protection should be their availability. Most cost items are hidden costs, and there are relatively few visible and easily measurable ones, especially quality costs. This is crucial and is most problematic from the point of view of an enterprise that strives to increase the efficiency of management systems, improve quality, and optimise related costs to identify where they are created, so that they are recorded according to the actual places of creation, not the places of disclosure (Sadkowski & Kołodziejczuk, 2017, p. 374).

Lean Accounting tools enable the optimisation of raw material supplies, elimination of all waste, reduction of consumption of materials and raw materials, reduction of transport costs, and reduction of consumption of fuel, energy, water, etc. Although these tools are not directly focused on protecting the environment, their effectiveness in eliminating mismanagement, reducing errors, and process optimisation can help reduce the negative impact of business activities on the natural environment. The growing environmental trend within ESG is very important and reflects the expectations that investors, customers, employees, and society as a whole have of companies and organisations. For this reason, it is essential in the long run to try to identify all possible environmental costs and quality costs.

Lean Accounting tools enable the optimisation of raw material supplies, elimination of all waste, reduction of consumption of materials and raw materials, reduction of transport costs, and reduction of consumption of fuel, energy, water, etc. Although these tools are not directly focused on protecting the environment, their effectiveness in eliminating mismanagement, reducing errors, and process optimisation can help reduce the negative impact of busi.

ness activities on the natural environment. They also provide valuable support for identifying and managing the costs of quality and environmental protection.

Integrated cost accounting for quality and environmental protection

Both the increase in the importance of reporting non-financial data regarding, in particular, environmental protection in enterprise operations, and the expected increase in the quality of manufactured products or services provided mean that information has to be obtained regarding the impact of the enterprise's activities on the natural environment, including environmental costs and knowledge of the costs of maintaining quality.

According to the authors, the integrated quality and environmental protection cost account (IQEPCA), which is part of the Lean Accounting subsystem, may play a special role in providing this type of data. Its tasks include primarily providing information necessary for:

- external assessment (i.e. carried out by the environment (by the surrounding community/by external organisations)) of the company's activities in terms of their impact on the environment;
- determining the burden incurred due to the use of or pollution of the environment in the form of ecological fees and taxes, emissions trading fees, compensation fees, and product and deposit fees;
- monitoring and actions aimed at minimising emerging pollution; identifying the company's environmental costs that may be hidden in overhead costs and allocating them to products;
- designing pro-ecological products, processes and services;
- determining the quality costs of new products and their production process or services provided;
- assessing the quality of new products or services provided;
- calculating the costs related to the prevention and detection of internal non-compliance;
- assessing opportunity cost;
- assessing the impact of the costs of quality and environmental protection on the economic efficiency of the enterprise (Szczerbak & Wikarczyk, 2023).

Performing the above-mentioned tasks through integrated cost accounting for quality and environmental protection involves the adoption of appropriate solutions in the entity to measure environmental costs, quality costs, their grouping, and inclusion in the records. To determine them, the impact of the business entity's activities on the natural environment and the needs related to the implementation of its environmental protection and quality objectives have to be ascertained, and those activities and processes in which these costs occur have to be isolated. Processes and activities will generate quality costs or environmental protection costs to varying degrees. Some are more noticeable, others more difficult to identify. In each enterprise, the strength of this relationship will vary depending on the type of business, its scope, and the activities performed in the organisation.

.

To date, quality costs and environmental protection costs have been an element often treated superficially in corporate accounting, due to the low and insufficient level of knowledge in this area and the lack of implementation of integrated management systems. The current situation in the markets is forcing enterprises to implement integrated cost accounting for quality and environmental protection to make it easier to exercise control over their activities and compete with other entities by improving the quality of the products/services offered in line with the concept of sustainable development.

The purpose of this integrated quality and environmental protection cost accounting is primarily to provide information on the development of quality and environmental protection costs in various areas, and to show the impact of isolated costs on the company's financial results and the possibility of using this data for an in-depth financial analysis of the company (Szczerbak & Wikarczyk, 2023). These assumptions can be used in the ESG concept. Thanks to IQEPCA, enterprises can better manage costs, including quality and environmental protection costs, which translates into benefits for society and the environment. This can help improve the company's image.

To show the validity of the implementation and benefits of integrated quality and environmental protection cost accounting (IQEPCA), the example of a limited liability company was used from the service sector, using selected components of IQEPCA appearing in the business profile of the enterprise in question. The analysed company provides consulting services in accounting, human resources, payroll, and tax advisory, operating in the Masovian and Łódź Voivodeships. It serves over 120 clients. In 2007, a quality management system compliant with the ISO 9001:2015 standard was implemented, with costs amounting to only 2% of operating expenses, indicating low implementation costs. This system enables continuous improvement of services and cost monitoring, supporting the company's financial stability. Despite the 15 years of system operation, up until 2022, the company did not separate quality costs or environmental protection costs in its accounting system, which also applied to its clients. Only in the integrated account of quality and environmental protection costs (IQEPCA) for the years 2021-2022 were these costs identified.

The company is implementing a new tool, which is an integrated cost account for quality and environmental protection (Table 1)¹ with obtained additional information.

¹ A shortened version of IQEPCA was presented due to the profile of the company's service activities.

.

The presented data shows that the company effectively manages the quality of its services, and minimises non-compliance, complaint costs, and other related expenses. The costs incurred also show that the audited company focuses on activities to prevent non-compliance: it hires a quality management rep-

resentative, organises internal and external training, conducts internal audits, and manages risk. It is also worth emphasising that lower quality costs are characteristic of the service industry because there is no risk of physical defects or complicated production processes. In the consulting industry represented by the

Table 1

Integrated Quality and Environmental Protection Cost Account (IQEPCA) for the period 2021–2022 (simplified version)

COST ITEMS	CURRENT	PAST
I. QUALITY COSTS	2022	2021
A. Costs of prevention/preventative activities	PLN	PLN
1. Development of quality programs – internal costs (hourly rate* x number of hours)	3,570	2,460
 Implementation of the ISO 9001–2015 quality management system (development of full documentation, including the organisational context of the entity) 		
3. Remuneration of the quality management representative	36,000	36,000
4. Supplier evaluation	2,976	2,880
5. Process quality control	4,284	4,920
6. Maintaining and developing the quality management system	7,500	5,500
 Training and development of employee awareness – internal training (hourly rate of the manager conducting training^{**} x number of hours) 	1,460	1,400
B. Quality assessment costs		
1. Document reviews/man-hours (internal auditor)	5,450	4,540
2. Internal audits (valuation using used man-hours)	5,600	5,180
3. External audit – invoice	2,500	2,800
4. Other costs		
C. Costs of internal non-compliance		
1. Fixing defects (quoting using man-hours used)	4,800	4,368
2. Unplanned breaks		
3. Repeated service/processing	6,000	5,460
4. Implementation of preventative measures, valuation using man-hours used	3,000	2,730
5. Other costs		
D. Costs of external non-compliance		
1. Creation of a complaints department		
2. Replacement of damaged products/part		
3. Repetition of service (price based on used man-hours)	550	400
4. Correcting a defect		
5. Discounts, rebates	3,800	2,400
6. Reimbursement		
7. Costs of specialists' opinions		
8. Implementation of preventative measures – valuation of employee training	9,500	21,500
9. Other costs		
E. Opportunity costs		
1. Loss of customer loyalty*** (total revenue in year n / number of customers in year n)	4,980	3,830

Note. * Average hourly rate in 2022 = total staff cost / number of employees / 168 hours. ** Average hourly rate in 2022 = total cost of management / number of managers / 168 hours. **** Total revenue / number of customers.

.

Table 1 – continue

COST ITEMS	CURRENT	PAST
TOTAL QUALITY COSTS (A+B+C+D+E)	101,970	78,370
II. ENVIRONMENTAL PROTECTION COSTS		
A. Costs of using the environment		
1. Fees for using the environment		
2. Eco taxes		
3. Charges for waste storage	1,164	1,164
4. Water consumption charges	7,560	6,132
5. Charges for electricity consumption	36,160	12,200
6. Other fees for using the environment (gas)	14,800	12,900
7. Consumption of office supplies	11,400	8,946
8. Consumption of household materials	6,450	5,800
9. Car lump sum	25,283	17,004
10.0ther costs		
B. Costs of prevention for environmental protection		
1. Employee training on environmental protection		
2. Ecological risk insurance costs		
3. Amortisation of fixed assets with a role in preventing environmental non-compliance (photovoltaic panels)	41,000	
4. Other costs		
C. Environmental protection assessment costs		
D. Costs of non-compliance with environmental protection requirements		
E. Restitution costs		
Ten	143,817	64,146
TOTAL QUALITY COSTS (A+B+C+D+E)	101,970	78,370
TOTAL QUALITY COSTS END ENVIRONMENTAL PROTECTION COSTS	245,787	142,516
I. TOTAL OPERATING COSTS	3,433,667	3,241,800
II. TOTAL REVENUE OF THE COMPANY INCLUDING REVENUE FROM ENVIRONMENTAL PROTECTION: SUBSIDIES, AWARDS, REVENUE FROM WASTE RECYCLING	3,894,099	3,488,313
III. NET PROFIT/LOSS	365,551	194,551
IV. PERCENTAGE SHARE OF QUALITY COSTS IN TOTAL COSTS	3.00%	2.0%
V. PERCENTAGE SHARE OF ENVIRONMENTAL PROTECTION COSTS IN TOTAL COSTS	4.20%	2.40%
VI. PERCENTAGE SHARE OF QUALITY AND ENVIRONMENTAL PROTECTION COSTS IN TOTAL REVENUE	7.20%	4.40%

.

Source: authors' own work based on the systematics of costs presented in "Managing the costs of quality and environmental protection as an imperative of financial security of a modern enterprise", M. Szczerbak & A. Ostanek, 2023, *International Journal of Legal Studies, 2*(14), pp. 344–348. (https://doi.org/10.5604/01.3001.0054.2719 335).

examined company, there is a relatively frequent risk of non-compliance related to frequently changing legal regulations. The analysis of the provided documents, reports, and financial statements shows that the audited company is improving and optimising its processes to also reduce this risk (Szczerbak & Ostanek, 2023).

The information presented in part E includes the quality cost share index and environmental protection

costs as a share of total costs, allowing customers to assess how important it is for the company to take care of quality and environmental protection in total costs. Such information may help to increase trust in the company, which in turn may translate into greater customer interest and positive relations with other stakeholders, such as employees, suppliers, and investors. In addition, customers increasingly . . .

demand that companies produce their products and services according to quality and ecological standards. In practice, it is assumed that the share of quality and environmental protection costs in total costs may have a significant impact on the company's financial results (Żukowska et al., 2016, p. 13).

The company's managers, analysing IQEPCA information, have taken steps to improve work before the next IQEPCA, which the company will prepare for 2023. Firstly, accounting systems and processes will be supplemented with items of quality and environmental protection costs included in IQEPCA. Secondly, formulas will be introduced for calculations/estimates of difficult-to-measure costs, especially opportunity costs, and calculated quality and environmental protection cost indicators. Quality cost items related to the prevention of non-compliance and opportunity costs, on the one hand, raised doubts among the management staff of the audited company as to the estimated levels. On the other hand, these costs were considered important because they affect the results achieved, especially in the case of high-risk decisions and volatile market conditions. They will therefore be estimated and compared to previous years. Additionally, IQEPCA can provide comprehensive and reliable data that is key to preparing an ESG report, enabling the company to monitor and report its impact on the environment, society, and management. This means that the company can better communicate its commitment to ESG issues and build a positive image among stakeholders.

Conclusion

The growing significance of ESG issues presents both challenges and opportunities for organisations. Recent years have clearly indicated the emergence of a new trend where market participants, including financial ones (investors, lenders), expect companies to provide additional ESG data. ESG reporting is essential not only for the further development of modern capital markets but also necessary for businesses operating within the value chain. The increasing number of regulations in this area, the gradual direction of financial flows towards sustainable investments, and social pressure contribute to a systematic rise in the importance of sustainable development.

This study highlights selected Lean Accounting tools such as continuous improvement cost accounting, product life cycle costing, target costing, activity-based costing, and value stream costing, which have significant potential to impact ESG goals. It also presents an integrated cost accounting system for quality and environmental protection. This accounting approach comprehensively addresses economic issues related to the company's actions with regard to the quality of services provided or products manufactured and environmental protection, proposing a financial reflection of complex ecological processes and quality processes within the accounting system. Its implementation enables identification and separation of quality and environmental protection costs, which enhances transparency and control over these costs and minimises the risk associated with improper management of these expenses. Furthermore, it helps identify activities that do not add value to the services provided from the client's perspective, leading to resource waste, and generating additional costs. Additionally, the accounting system reveals areas where environmental protection measures are needed, diagnosing areas for improvement in quality and operational efficiency.

The integrated cost accounting system for quality and environmental protection serves as a valuable tool, particularly beneficial for the small and mediumsized enterprise (SME) sector. With this tool, these companies can streamline the implementation of ESG principles, especially concerning environmental data reporting and corporate governance. The integrated system allows these firms to gain a more comprehensive view of their operations, taking into account quality costs and environmental impacts. It also aids in identifying areas that require improvements and in creating more transparent and sustainable business strategies. As a result, it supports goals related to sustainable development, social responsibility, and a more comprehensive approach to management aligned with ESG principles.

Implementing the Integrated Cost Accounting System for Quality and Environmental Protection (IQEPCA) in the analysed company yields tangible benefits that can inspire other businesses, particularly in the service sector. An essential measure is the quality management system, which supports data identification in (IQEPCA). Companies, especially SMEs, should start with this system to effectively implement quality and environmental processes.

Regular internal audits allow early detection of problems and monitoring compliance with established standards, facilitating continuous process improvement. Introducing risk management procedures that identify and assess risks associated with quality and environmental issues helps minimise potential losses and increases operational stability.

Enhancing accounting systems with quality and environmental cost items improves transparency and enables better financial management. The introduction of specific formulas for calculating costs, such as opportunity costs, makes cost management more accurate and efficient.

Given the specific solutions that contributed to the success of the analysed company, other businesses should consider implementing IQEPCA. These actions not only reduce quality-related costs but also build trust among stakeholders and enhance market competitiveness. In light of increasing ESG reporting requirements, adopting IQEPCA is becoming a critical step toward sustainable development and responsible management.

Accounting firms can provide valuable support in implementing IQEPCA by offering assistance in accounting and finance. External funding sources,

such as budget grants, can facilitate the implementation process.

In view of the benefits of applying IQEPCA, continued research to identify quality and environmental costs and their impact on company performance is recommended. Future studies should focus on analysing differences in the application of IQEPCA across various industries and economic sectors, which would provide a better understanding of the most effective tools and methods in specific operational contexts.

Additionally, it is recommended to isolate quality and environmental protection costs in the profit and loss account, enabling external users to better understand companies' commitments to ESG activities. Such an approach would not only facilitate comparative analysis of companies regarding sustainable development, but also help in a more precise evaluation of a company's long-term ESG strategy.

Research should concentrate on developing advanced formulas and indicators for better measurement of hard-to-measure costs, such as opportunity costs, which is particularly important in volatile market conditions.

References

Ackah, P., & Lamptey, L. L. (2017). Corporate Social Responsibility Reporting (CSRR) by the banking industry in a developing economy. Asian Journal Of Economics, Business And Accounting, 2(3), 1-10. https://doi.org/10.9734/ AJEBA/2017/32353

Aluchna, M., Roszkowska-Menkes, M., & Kamiński, B. (2023). From talk to action: the effects of the non-financial reporting directive on ESG performance. Meditari Accountancy Research, 31(7), 1-25. https://doi.org/10.1108/ MEDAR-12-2021-1530

Amel-Zadeh, A., & Serafeim, G. (2018). Why and how investors use ESG information: Evidence from a global survey. Financial Analysts Journal, 74(3), 87-103. https:// doi.org/10.2469/faj.v74.n3.2

Balon, U. (2006). Przegląd wybranych modeli klasyfikacji kosztów jakości. Problemy Jakości, 6, 15-19.

Biermann, F., Kanie, N., & Kim, R. E. (2017). Global governance by goal-setting: the novel approach of the UN Sustainable Development Goals. Current Opinion in Environmental Sustainability, 26, 26-31. https://doi. org/10.1016/j.cosust.2017.01.010

1.0

100

Bofinger, Y., Hevden, K. I., & Rock, B. (2022). Corporate social responsibility and market efficiency: evidence from ESG and misvaluation measures. Journal of Banking & Finance, 134. https://doi.org/10.1016/ j.jbankfin.2021.106322

.

Chanegrih, T., & Creusier, J. (2016). The effect of internal and external Lean Practices on performance: A firm-centered approach. International Management, 21, 114–125.

Ciechan-Kujawa, M. (2005). Rachunek kosztów jakości. Oficyna Ekonomiczna.

Dec, P., & Wysocki, J. (2022). In search of non-obvious relationships between greenhouse gas or particulate matter emissions, renewable energy and corruption. Energies, 15(4), 1347. https://doi.org/10.3390/en15041347

Dobija, D., & Kucharczyk, M. (Eds.), (2014), Rachunkowość zarządcza: analiza i interpretacja. Wolters Kluwer Polska.

European Union. (2014). Directive 2014/95/EU of the European Parliament and of the Council of 22 October 2014 amending Directive 2013/34/EU as regards disclosure of nonfinancial and diversity information by certain large undertakings and groups Text with EEA relevance. http://data.europa. eu/eli/dir/2014/95/oj

European Union. (2019). Regulation (EU) 2019/2088 of the European Parliament and of the Council of 27 November 2019 on sustainability-related disclosures in the financial services sector (Text with EEA relevance). https://eur-lex.europa. eu/eli/reg/2019/2088/oj

European Union. (2020). Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088 (Text with EEA relevance). https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32020R0852

European Union. (2022). Directive (EU) 2022/2464 of the European Parliament and of the Council of 14 December 2022 amending Regulation (EU) No 537/2014, Directive 2004/109/EC, Directive 2006/43/EC and Directive 2013/34/EU, as regards corporate sustainability reporting (Text with EEA relevance). https://eur-lex.europa.eu/eli/ dir/2022/2464/oj

Fajczak-Kowalska, A. (2004). Koszty jakości oraz ich rachunek. Problemy Jakości, 8, 33-35.

Firlej, K. (2018). Corporate Social Responsibility as a challenge in the agri-food sector. Corporate Social Responsibility as a Challenge in the Agri-Food Sector, 20(4), 47–53. https://doi.org/10.5604/01.3001.0012.2942

Flammer, C. (2021). Corporate green bonds. Journal of Financial Economics, 142(2), 499-516. https://doi. org/10.1016/j.jfineco.2021.01.010

The full list of references is available in the online version of the journal.

. Monika Szczerbak is a doctor of economics, academic lecturer and research and teaching assistant at the Faculty of Security, Logistics and Management at the Military University of Technology in Warsaw, Poland. Specialist in a management control and internal audit. Member of the International Network of Accountants and Auditors. Author and co-author of numerous articles and books in the fields of accounting, auditing, and management.

E Paweł Dec is a professor at the Warsaw School of Economics, SGH Warsaw School of Economics, habilitated doctor of social sciences in the discipline of economics and finance. Head of the Department of Research on Corporate Bankruptcy at the Institute of Corporate Finance and Investment at the Warsaw School of Economics. Head of Postgraduate Studies in Internal Audit and Management Control in Public Finance Sector Units. Expert in the assessment of the economic and financial condition of enterprises, restructuring and prediction of bankruptcy of economic entities.

e-mentor

FOR THE AUTHORS

"E-mentor" is the academic journal included in the current Ministry of Science and Higher Education journal list. The authors of scientific peer-reviewed paper published in "e-mentor" gain 40 points.

"E-MENTOR" JOURNAL - WWW.E-MENTOR.EDU.PL

Publishers: SGH Warsaw School of Economics and Foundation for the Promotion and Accreditation of Economic Education Editor's office: al. Niepodległości 162/150, 02-554 Warsaw, Poland, phone +4822 5647831, e-mail: redakcja@e-mentor.edu.pl

The journal is being published since 2003 in electronic (online and pdf) and printed form. All the scientific articles undergo the peerreview process by the experts in the corresponding areas of knowledge. We publish the list of the reviewers once a year, usually in the last volume. Resulting from our internationalization efforts, from 2017 two out of five issues every year were published in English, and since 2025 all the articles are published in English only.

PUBLISHING POLICIES

"E-mentor" journal is registered in the Crossref database, and every article published gets an individual DOI. Our journal is also indexed in the ESCI Web of Science database, as well as CEJSH, EBSCO, BazEkon, CEEOL, and EuroPub. It is included on POL-index and Index Copernicus Journals Master List. Since the first issue of "e-mentor," we apply the open access policy. Publishing in "e-mentor" is free of charge. Every submitted article undergoes a double-blind peer-review procedure. Such practices as plagiarism, ghost-writing, and guest writing are unacceptable. Every scientific paper must be the original, not previously published work. It cannot infringe the third parties' copyright and may not be the subject of the editorial procedure elsewhere at the same time.

ARTICLES' PROFILE AND SCOPE

We accept original scientific papers which must successfully pass the review process, book reviews, conference reports, and feuilletons. The thematic scope of the journal covers teaching and learning in management and economics higher education. We aim to provide a platform for the exchange of knowledge and insights on the use of technology in education, including e-learning, forms and methods of education, the verification of learning effects, and the integration of new trends in management and economics into higher education.

AUTHOR GUIDELINES

The manuscript submitted for publishing in "e-mentor" should not exceed 35–40 thousand characters, including spaces, conform to the APA style for references and in-text citations. The author(s) should submit the paper written in British English followed by the abstract and at least five keywords. Upon acceptance, please supply figures/graphics/images in at least 300 dpi. Please remember that indicating the source of the graphics or data is compulsory.

Detailed instructions for authors and the article template are available at: https://www.e-mentor.edu.pl/eng/page/8

Authors retain the copyright of their work, with first publication rights granted to the "e-mentor" journal. Reprinting any article or its part is possible under permission only. The editorial office reserves the right to make necessary changes to the materials qualified for publication.







SGH shapes leaders

We offer full-time studies in English

First-cycle programmes:

- Global Business, Finance and Governance
- International Economics
- Management
- Quantitative Methods in Economics and Information Systems

www.sgh.waw.pl/admission

Second-cycle programmes:

- Advanced Analytics Big Data
- Finance and Accounting with ACCA Qualification
- Global Business, Finance and Governance
- International Business















