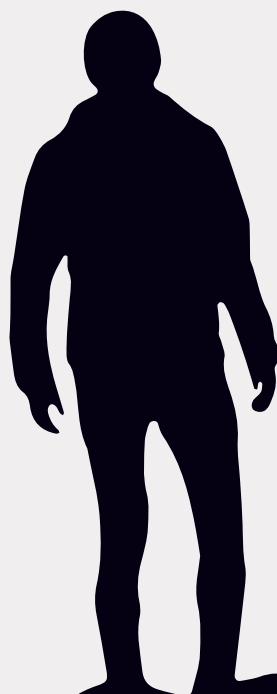


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#GJSD. Sharing today. Shaping tomorrow.

SUBMIT

Dear Reader,

"*Non scholae, sed vitae discimus.*" (We do not learn for school, but for life.) – Seneca

As we celebrate the fifth volume of the GILE Journal of Skills Development (GJSD), I find myself reflecting on how profoundly Seneca's words resonate today. The world of education and work is evolving at an unprecedented pace, driven by technological advancements, shifting employer expectations, and the growing need for adaptability. More than ever, learning is not just about acquiring knowledge - it is about resilience, innovation, and a lifelong commitment to growth. With this issue, we continue our mission to explore these critical themes, bringing together research and perspectives that inform, inspire, and spark meaningful dialogue.

This issue brings together a diverse collection of research and perspectives that explore how we learn, teach, and adapt. From workforce readiness and leadership in education to innovative pedagogical approaches these studies provide valuable insights into the challenges and opportunities that are shaping the future of learning and employability. Beyond research, we also engage with pressing contemporary discussions, such as the impact of Generative AI on student learning and the evolving role of resilience in career success.

The Research Papers section brings together nine studies, categorised into four key themes: **Skills Development and Workforce Readiness, Leadership and Education, Pedagogy and Learning Approaches, and Higher Education and Motivation.**

In the first category, Skills Development and Workforce Readiness, we present two papers. The study by **Megashnee Munsamy and Arnesh Telukdarie** uses Big Data Analytics to predict the skills for South Africa's food and beverages manufacturing sector, drawing insights from two decades of research published in the Scopus database. Identifying four key areas - entrepreneurship with digital expertise, data analytics, digital tool implementation, and sustainable operations, aligning with global trends. The paper titled *Skills Prediction for the South African Food and Beverages Manufacturing Sector: A Big Data Analytics (BDA) Approach*, offers a forward-thinking approach to workforce planning in an increasingly digital and sustainability orientated era.

As the Fourth Industrial Revolution reshapes the world of work, how can organisations future-proof their workforce? **Ian Fellows's** paper *We Have Enough Neurotypical Thinkers Already. Why Accommodating and Developing a Neurodiverse Workforce Is the Right Strategic Approach to Navigating the Fourth Industrial Revolution* argues that embracing neurodiversity is not just an ethical imperative but a strategic necessity. The paper highlights how organisations can harness the potential of neurodiverse employees to navigate an increasingly VUCA economy.

In the next category, Leadership and Education, **Ian Fellows** examines how academics' views on leadership align with the literature, particularly in supporting widening participation students in developing leadership skills. The paper titled *Do Academics' Views on Leadership Align with the Literature, and How Does This Impact Their Teaching of Widening Participation Students?* highlights the importance of a clear, coherent leadership framework for teaching and suggests further research to improve academic practice in this area.

In their study *Understanding the Early Impacts of School Mentors' Ethics of Care on Filipino Gen Z Novice Science Educators' Informal Professional Learning* **Marwin E. Obmerga and Francis Michael P. Yambao** explore the early impacts of care-driven mentorship on the informal professional learning of Filipino Gen Z novice science teachers, highlighting three learner personas shaped by their interactions with mentors. The findings offer insights for improving mentorship strategies and professional development to support this cohort's transition into the teaching profession.

In the category Pedagogy and Learning Approaches, we present three papers. **Natia Bendeliani and Tibor Bors Borbély-Pecze** in their study titled *University Teachers' Conceptions of Their Role in Teaching Problem-Solving* explore how university tutors perceive their role in teaching problem-solving within a problem-based learning (PBL) environment, highlighting a progression from creating a safe learning space to fostering independent learners. The findings offer valuable insights for improving tutor training and enhancing student-centred learning in higher education.

The literature review, *The Practice of Implementing Project-Based Learning in the EFL Classroom*, written by **Irén Nagy** examines the effectiveness of Project-Based Learning (PBL) in teaching English as a foreign language, highlighting its role in developing both language and 21st-century skills like critical thinking, cooperation, and digital skills. The findings suggest that while PBL can enhance student engagement and skill development, it presents challenges due to time demands and insufficient teacher training.

We are happy to feature a pilot study that explores how object-based and collaborative learning in art galleries and museums can help university students develop transferable skills, such as critical thinking and collaboration. The findings of the paper *Developing University Students' Transferable Skills Through Object-Based and Collaborative Learning. An Exploration into the Role of Art Galleries and Museums* by **Viktoria Jackson** highlight the value of these informal learning environments in fostering student engagement, reflection, and deeper discussions, complementing traditional classroom education.

In the last category, Higher Education and Motivation, we feature two papers. **Daria Borodina and Adrian Estrela Pereira** in their paper titled *Domestic and International Doctoral Students' Motivation to Study at Hungarian University: A Comparative Study* compare the motivations of domestic and international doctoral students at Hungarian universities, using the self-determination theory to examine intrinsic and extrinsic factors. The findings reveal that domestic students are more motivated by gaining knowledge, while international students experience higher levels of amotivation, offering valuable insights for developing more tailored doctoral programmes.

The comparative pilot study written by **Ei Phyo Maung, János Gordon Györi, and Csaba Kálmán** explore the motivational disposition of EFL pre-service teachers in Myanmar and Hungary, focusing on English writing skills development. The findings of their paper *Motivational Disposition in English Writing Skills Development for EFL Pre-service Teachers. A Comparative Pilot Study of Myanmar and Hungary* highlight differences in motivational factors between the two countries, offering recommendations to enhance motivation and improve writing performance in teacher training programmes.

In addition to research-driven studies, Volume 5. No. 1. includes three thought-provoking Food for Thought contributions that encourage dialogue on contemporary challenges in education, skills development, and society.

As Generative AI reshapes industries and education, many are asking: How should we integrate these technologies into academic writing? **Ian Fellows's** paper *Generative AI Robs Students of the Joy of Learning* examines the impact of Large Language Models (LLMs) on student learning, arguing that their use beyond grammar-checking hinders the development of essential thinking and writing skills. Grounded in the Basic Model of Learning to Write Well, it highlights higher-order thinking as the core of education and celebrates the joy of learning as an irreplaceable human experience.

Meanwhile, the conversation around employability and resilience continues to evolve. **William E. Donald and Michael Healy's** paper *We Need To Talk About Resilience: The Case for a Pragmatic and Holistic Perspective* explores resilience as a key component of employability. Moving beyond simplistic positive psychology views, it presents a nuanced approach underpinned by the Employability Capital Growth Model (ECGM) and sustainable career theory. By likening resilience to strength training - emphasising adaptability, support systems, and recovery - the authors offer a fresh perspective on how students and graduates can navigate career challenges while maintaining well-being.

How can Open Science (OS) shape the future of innovation, economic growth, and career opportunities for young professionals? As knowledge creation evolves, the European Union is embracing OS to drive research and competitiveness - but is it working? In *Effectiveness of European Open Science Policies on Improving Economic Competitiveness*, **István Kárász** evaluates the European Commission's approach, highlighting both its transformative potential and the barriers that remain. Just as AI is reshaping education and resilience is redefining employability, OS is revolutionising access to knowledge. Using insights from the European Innovation Scoreboard and key policy reports, this paper examines how stronger governance and harmonised policies could create a more dynamic, opportunity-rich environment for the next generation of researchers, entrepreneurs, and skilled professionals.

As lifelong learners, we rely on research not only to generate new knowledge but also to refine the way we think, teach, and engage with the world. With this in mind, we are pleased to feature **Brigitta Czók's** Book Review of *Research Done Right: A Practical Guide to Social Science Research* by Paul Delnooz. This comprehensive guide offers researchers and educators practical insights into methodology, data analysis, and ethical considerations. By providing essential tools for conducting rigorous and impactful research, it serves as a valuable resource for those committed to continuous learning and scholarly excellence.

This volume is an invitation - to foster dialogue, challenge assumptions, and spark new ideas. Whether you are a researcher, educator, policymaker, or lifelong learner, I encourage you to dive into these contributions with curiosity. May they inspire new conversations and fresh perspectives.

Happy reading!

Warm regards,

Dr habil. Judit Beke

Dr habil. Judit Beke is the Editor-in-Chief at GJSD



GILE Journal of Skills Development

Skills Prediction for the South African Food and Beverages Manufacturing Sector: Towards Addressing the High Youth Unemployment

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Abstract

The high unemployment rate, especially among the youth in South Africa, necessitates addressing the skills requirements to meet the labour market demands. In South Africa, the Sector Education and Training Authorities are mandated to identify and provide the skills demanded. A quantitative approach of big data analytics is proposed for predicting the future skills of the South African food and beverages manufacturing sector. The source of big data is skills-related publications from the Elsevier Scopus database, for the period 1999 to 2020. Natural language processing, and word representation technique was applied to quantify and analyse year-on-year change of author and index keywords, subject areas and number of publications towards the determination of the future skills requirement. The analysis identified four vital skills: (1) entrepreneurship inclusive of digital skills; (2) data analytics inclusive of AI, simulation, and modelling; (3) digital tools and technologies implementation, and operation; and (4) sustainable operations skills of advanced process control, and energy, water, and resource optimisation. The identified skills were comparatively analysed with the World Economic Forum predictions for skills requirements for 2025, with the results aligning to the findings and validating the approach. The approach is applicable to any Sector Education Training Authority in South Africa. This enables enhanced skills planning to better prepare the South African workforce, especially youth, given the persistent challenges to completion of Grade 12 leading to access to higher education. It is acknowledged that youth with tertiary qualifications have a better chance of employment than those without, thus skills planning initiatives is essential. The skills gap cannot be instantaneously addressed but requires a long-term strategic effort from all stakeholders in the skills ecosystem. As a starting point in youth skills development, short courses to workshops to workplace training is a feasible option.

Keywords/key phrases: big data analytics, skills prediction, food and beverage, fourth industrial revolution, digital skills

1. Introduction

The ability to accurately predict future skills is a key strategy of governments the world over with the objective of sustaining economies and seeking key differentiators for growth. The highly competitive global skills space is influenced by various domestic and international factors. With the onset of the fourth industrial revolution, the pace of change of skills is accelerating, making predicting skills requirements an interesting opportunity. Country specific protocols of skills prediction, together with regional and global organizations protocols exist and are diverse. The skills predicted by these countries and regional groups have matured over the years, with the prediction cycle requiring many years for verification with multiple variables considered.

Skills forecasting is a systematic method to derive quantified projections of future skills needs by using labour market and skills information (British Council, 2018). Skills forecasting enables informed decision-making by policymakers and improves labour market operations (ILO-OECD, 2018). It enables the education and training systems to strategically respond and prevent skills shortages and mismatches (ILO, 2020). The availability of the required skills by the labour market facilitates economic growth (ILO, 2020).

The key drivers of the rapidly evolving skills requirements of the labour market are the fourth industrial revolution (4IR), globalisation, climate change, and demographic changes (ILO-OECD, 2018). The 4IR and its disruptive nature make future skills forecasting even more critical, but also more complex and challenging (ILO-OECD, 2018). Within the global manufacturing industry, 13.2% of workers are at risk of displacement due to digitization, with only 44.6% of the displaced workers expected to be successfully redeployed (World Economic Forum, 2020). The skills required influence occupational standards, apprenticeship as well as learnership designs, training programmes, national and sectoral employment and skills strategies, curriculum development, and career guidance (ILO-OECD, 2018).

South Africa has one of the highest unemployment rates in the world of 34.5%, which requires systematic and aggressive measures to address (Statistics South Africa (a), 2022). In addressing the high unemployment rate, the provision of future skills is critical. However, South Africa lacks a skills forecasting model (DHET, 2019), which is detrimental to its economic growth and addressing of the present inequalities. Thus, skills forecasting is a priority for South Africa. The South African food and beverages manufacturing sector, a key contributor to Gross Domestic Product GDP and employer of the labour force, lacks a tool for skills forecasting. The sector is in transition driven by the 4IR, the COVID-19 pandemic, climate change and evolving customer requirements. To remain competitive in the global marketplace, the sector needs to transform faster. In some countries the sector has advanced via adoption of digital transformation in addressing climate change and evolving customer requirements. Understanding and learning from these advancements is an opportunity to propel the digital advancement of the South African food beverages manufacturing sector. But this advancement is reliant on the availability of required skills.

The existing skills model are typically country specific, focusing on either skill supply or demand, data intensive, requiring extended periods of quality data, and requiring a high level of technical proficiency, which is limiting to a developing country such as South Africa. In developing a South African skills forecasting model key considerations include practicality and accessibility of the results, and the costs of the exercise (ILO-OECD, 2018). Big data analytics (BDA) was identified as an accepted to forecasting, that is especially applicable to a developing country. This study adopts a BDA approach to predict the skills demand of the food and beverage manufacturing sector.

2. Literature Review

Every country has a specific set of internal and external drivers impacting skills demand; hence skills prediction models are typically country specific. Some countries conduct occupational projections instead of skills forecasting, but in identifying future occupations the skills requirements are inherently defined. Globally, skills forecasting approaches are qualitative, quantitative, or integrated. Qualitative approaches range from surveys to sector studies to expert discussion forums, whilst quantitative approaches are modelling, or simulation based. An integrated approach merges the quantitative and qualitative methods; the use of qualitative results in the quantitative models addresses issues such as missing data or breaks in time series, incorporates the tacit knowledge of experts, and the use of past trends and current drivers (ILO-OECD, 2018). Skills and occupations forecasting can be at a macroeconomic, regional, or sectoral level.

2.1. South African Status

South Africa is experiencing persistently high unemployment rates as demonstrated for the period 2018-2023, where unemployed people increased from 6.1 million in 2018 to 7.9 million in 2023 (Statistics South Africa (b), 2024). Of the 7.9 million unemployed, 3.4 million had matric while 4 million did not have matric. However, only 9.4% of the total unemployed had tertiary education, (Statistics South Africa (b), 2024).

The youth in South Africa are disproportionately affected by the high unemployment rate. For the period 2018 – 2023, youth unemployment was almost twice that of adults (Statistics South Africa (b), 2024). In Quarter 3 of 2024, it was observed that 10.3 million people aged between 15 and 24 were not in employment, education, or training (Statistics South Africa (c), 2024). The youth are primarily employed in low and semi-skilled occupations due to lack of education and skills (Statistics South Africa (b), 2024). For 2023, 44% of unemployed youth did not complete matric, 45.3% completed matric and 10.1% had a tertiary qualification.

Based on the data from above, education and training are critical factors in unemployment, especially among youth, who do not have on-the-job training of adults. Given the importance of education and training on unemployment, it becomes essential that Higher Education Institutions (HEIs) and Sector Education Training Authorities (SETAs) provide the necessary skills set to youth to meet the demands of the labour market. Similarly, policies promulgated by the government should focus on the support and development of youth, facilitating the completion of matric at a minimum and access to tertiary and vocational training and other learning initiatives. Thus, skills forecasting is essential in identifying initiatives to support the skilling of youth to improve employability.

2.2. South African skills forecasting approach

In South Africa, the provision of skills is the mandate of SETAs. There are 21 SETAs in South Africa, and each is specific to a particular economic sector. The mandate of the SETAs is to analyse sector priorities via the collection of data from companies in the sector, interpretation of data, and support of emergent skills profile through learnerships and other mechanisms. Each SETA independently defines its skills requirement for its sector based on the analyses of workplace skills plans submitted by companies comprising the sector and interviews with said companies. The workplace skills plan is submitted annually by companies and defines the current occupations and skills requirements of the said company. Thus, in the current skills cycle, the economic sectors, chambers, and companies influence the skills development process. The primary challenge is the limited future skills forecasting, including digital and technological skills. In South Africa, the current skills do not meet industry demands, resulting in a skills mismatch and intensifying the current high unemployment rate. Based on the findings of the 2020 World Economic Forum (WEF) report, the anticipated future skills in South Africa are analytical and critical thinking, problem-solving, innovation, resilience, quality control, technology use, design and programming, and emotional intelligence (World Economic Forum, 2020).

2.3. Global review of skills forecasting

A review of the approaches adopted by various countries was conducted. The countries were selected based on their established system of skills and/or occupation predictions. Most countries adopt a semi-integrated approach, with qualitative and quantitative approaches conducted independently with none to limited integration. The quantitative approaches adopted typically comprises of:

1. Surveys/questionnaires for employers, workers, and graduates on qualifications, skills, occupations, and occupational growth
2. Census or population data
3. Statistical documents on the labour force (current and future, if available)
4. Business surveys

The quantitative approach is fundamentally based on an economic approach, which varies from regression to econometric models. The models commonly utilise historical data in terms of occupation trends, population data and economic data. The models typically determine the demand of skills/occupation, with some models determining the supply and demand side and other model determining an equilibrium state of supply and demand.

In a review of countries with established skills forecasting approach, as presented in Table 1, it is notable that all countries except Brazil (a developing country) are categorised as first-world countries. The approaches of both developed and developing countries are analysed to identify an approach appropriate to South Africa, which is at the infancy stage of skills forecasting. In review of the skills and/or occupations forecasting approach of India and China, there is limited to no information from either public or private institutions on skills or occupation prediction. Thus, an approach to skills or occupation prediction could not be determined for either country

(British Council, 2018). However, it should be noted that both countries have several initiatives on skills development including upskilling.

TABLE 1. CHARACTERISTICS OF THE VARIOUS COUNTRY SPECIFIC SKILLS/OCCUPATIONS MODEL

Country	Approach	Skill/occupations	Time span of prediction	Frequency of update	Models feature	Survey Types
Canada	Quantitative (Government of Canada, 2023), (Employment and Social Development Canada, 2022) and Qualitative (OECD, 2016)	Forecasts 292 occupational groupings and skills	10 years national level	2 years	• Macroeconomic model • Considers 42 industries • Supply side estimation • Data intensive	Employers, and workers, or graduate surveys
USA	Quantitative (U.S. Bureau of Labor Statistics, 2021) and Qualitative (OECD, 2016)	Occupations projections	10 years national level	2 years	• Macroeconomic model • Inclusion of 205 commodities • Follows a six-step process, which examines: ○ Size and demographic of labour force ○ Aggregate economic growth ○ Commodity final demand ○ Input-output ○ Industry output & employment ○ Occupational employment and openings • The model is designed to achieve full employment in the target years • Data intensive	Workers or graduate surveys
UK	Quantitative (Wilson, Barnes, May-Gillings, Patel, & Bui, 2020) and Qualitative (OECD, 2016)	Projects occupational employment for each industry	• 10-year national and regional level • National level - 87 industries • Regional level - 46 industries		• Multisectoral dynamic model (MDM-E3) • A macroeconomic model, which links with a qualification supply model and main occupation model. These models link to other models. • Requires long times series data set • Complex	Employer and national surveys on occupational and qualification structures; labour force survey; annual employment survey; annual business survey, and population and census survey

Australia	Quantitative (National Skills Commission, 2022)	Occupations and skills prediction	5-year employment forecasts by industry, occupation, skill level and region	Yearly	- Derived from time series models. - Combines forecasts autoregressive integrated moving average (ARIMA) and exponential smoothing with damped trend (ESWDT) models	Australian Bureau of Statistics labour force survey
	Quantitative (CoPs, 2022)	341 occupations predictions		Yearly	- General Equilibrium model of the Australian economy - Required up-to-date data - Utilises information from specialist forecasting organisations and historical trends	
	Qualitative (OECD, 2016)					Employers, and workers, or graduate survey
Germany	BIBB-IAB qualification and occupational field projections (Quantitative) (Maier, 2017) and Qualitative (OECD, 2016)	Occupations prediction	15–20 years	2 years	- QINFORGE econometric model - Determines both supply and demand at the occupation level - Data intensive - micro census data is used as well as data from education institutions	Micro census data and employer and workers or graduate surveys
Brazil	Senai Model (Quantitative and Qualitative) (ETF, 2016)	Skills prediction at the national level	5–10 years		- Identifies emerging technologies that will influence the occupations demand and the associated skills - Analysis of occupational trends via two models; an input-output model and analysis of the database of the Ministry of Labour and Employment - The results are compared to the sector occupational demand/changes of USA, Canada, Australia, New Zealand, and the UK	

Source: own compilation

All the countries reviewed adopt both qualitative and quantitative approaches for skills and occupation predictions, but not necessarily an integrated approach. Common characteristics among the models include:

- Updating the model bi-annually, with Australia updating its model annually. The frequency of the updates enables the system to moderate the impacts of shocks to the system such as COVID-19, whilst allowing the longer-term drivers of skills and

occupation changes to be understood and defined such as 4IR, globalisation, and climate change.

- b. A macroeconomic structure
- c. Requiring time series data for aggregated and disaggregated model input variables

The challenge of these forecasting models is the data requirements, extended periods of data, and the quality of the data. This is especially challenging for developing economies, where data availability and quality are limited. The Brazilian approach is distinctive, with a focus on emerging technologies. The key emerging technologies are identified together with their impact on occupations (current and new), thereby allowing the identification of the required skills. To verify the results, comparisons to the sector and occupational change predictions of the USA, Canada, Australia, New Zealand, and the United Kingdom were conducted. This is an interesting approach that could have applicability in developing countries, as key drivers of skills are globalisation, and technological advancements. This approach also negates the intensive data requirements of macroeconomic skills forecasting models.

2.4. Big data analytics

Informed decision making is essential for organisational success, which impacts a country's growth and competitiveness (Elgendy, Elragal, & Päivärinta, 2022). The fourth industrial revolution presents tools for facilitating skills forecasting, such as big data analytics (BDA). BDA is applied to define the unknown in data (Elgral & Klischewski, 2017) and to facilitate decision-making. BDA has been applied in various sectors in support of decision-making; retail, hospitality, entertainment, government, health, finance, manufacturing, and transport (Sabharwal & Miah, 2021). There are three BDA classes; descriptive, predictive, and prescriptive. Descriptive describes what has happened or what is happening, predictive defines what is to happen, and prescriptive defines what should be done, to achieve what should be happening (Sabharwal & Miah, 2021). Big data analytics (BDA) together with artificial intelligence (AI) enables the analysis of large volumes of data in short time periods of time to extract relevant labour market information (ILO, 2020). The BDA process can be broken down into the following phases: (1) big data acquisition, (2) data pre-processing, (3) data analysis, and (4) information interpretation (Elgral & Klischewski, 2017). Big data acquisition is the gathering of data. The data can be obtained from various sources such as social media platforms, IoT devices, online job vacancy sites, and databases. Information extracted from text is referred to as text mining, while information obtained from unstructured audio data is audio analytics. Similarly, information extracted from video streams and social media channels are video analytics and social media analytics respectively (Gandomi & Haider, 2015). Once the data is gathered it must be cleaned in the pre-processing stage. This encompasses all steps for ensuring consistency of data, such as removal of duplicates, and missing values, and consolidation and integration of data (Gandomi & Haider, 2015). In the data analysis step, various techniques are applied to analyse the data, ranging from simple regression algorithms to various AI techniques, such as random forests to artificial neural networks. In the final step of interpretation, the information extracted from the analysis is interpreted and visually presented to aid in decision-making.

BDA has been applied in skills and occupation forecasting, typically adopting a text mining approach of usage of data gathered from online job vacancy sites to predict skills demand. The

European Centre of the Development of Vocational Training (CEDEFOP) investigated the use of online job vacancies (OJVs) to gather intelligence on skills (ILO, 2020). It has established the skills online vacancy analysis tool for Europe (OVATE), which presents the information extracted from OJVs. The information, presented in a dashboard format, includes online job advertisements by occupation and most requested skills. It is advised that OJV analysis should not replace conventional methods but support it. The advantages of OJVs include a large volume of data, time, and cost-effectiveness as well as in-depth information on skills, whilst the disadvantages include unstructured information, non-representativeness, and advanced analytical skills (ILO, 2020). Mezzanzanica and Mercorio (2019) identified big data for predicting future skills, new and emerging occupations, and the rate of digital skills adoption by occupation. They further state that big data is critical for future skills prediction as the vacancies advertised on the internet is the only alternative source of information provided by skills survey and big data provides detailed and granular data to illustrate the variation in skills demand across occupations, sectors, and regions. Big data from an online job vacancy portal, together with AI techniques, were used to analyse the labour market and demand for jobs and employment in Malawi. The results provided various insights, including trending jobs in the labour market (Mezzanzanica & Mercorio, 2019). LinkedIn, a professional network that is employment orientated, utilizes its own data in determining how occupations are changing, the skills required by workers and identifies the key skills on a yearly basis. The similarity of the scores between the two years indicates the overlap of common skills and the relative importance of the skills. Six years of data were aggregated and analysed (LinkedIn, Future of skills, 2021). The results are presented at three resolutions of country, sector, and occupation on their website Economic Graph (LinkedIn, Future of skills, 2021).

Currently, a key characteristic of big data in skills prediction is the use of online job vacancies as the primary source of data. This can be a limitation, as there is a potential of bias in coverage of occupations, firm sizes, and regions (CEDEFOP, 2019). In developing countries, especially in Africa, the online job posting may be skewed to the requirements of businesses based in urban areas, whilst the skill demand of the rural areas is lost. Thus, necessitating the use of an unbiased source for data acquisition.

3. Methods

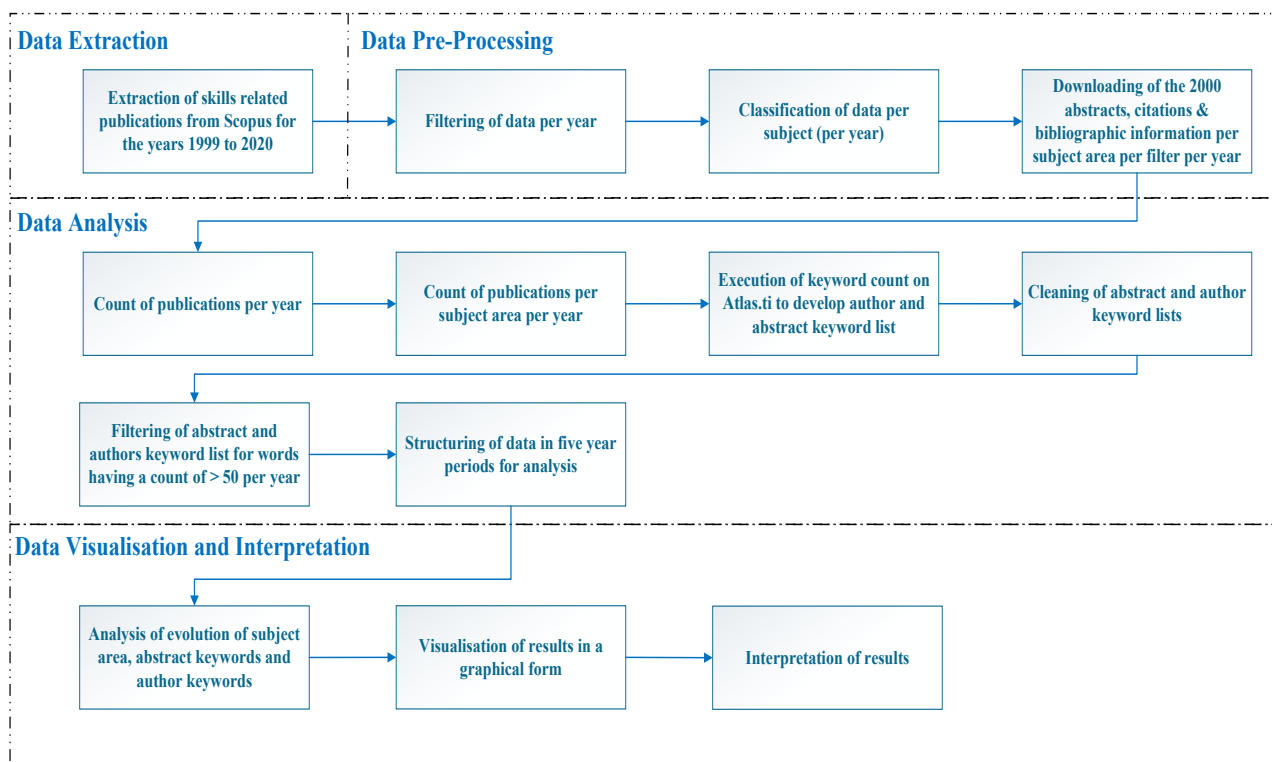
A text mining BDA approach was adopted as it enabled forecasting of future skills without the intensive data, time, and cost requirements of traditional quantitative methods. (Mezzanzanica & Mercorio, 2019), (ILO, 2020) and (LinkedIn, Future of skills, 2021) utilised online vacancy sites in their text mining BDA approach. Due to the potential biases of the South African online job sites that focuses on economic hubs and following the principle of learning from what has been achieved globally, this study adopted the Elsevier Scopus database as the source of big data.

The Elsevier Scopus database defines the skills evolution in the food and beverages manufacturing sector, the current status, and the future trajectory, which could influence the South African labour market. The information can be considered to be valid, since all Elsevier Scopus publications are peer reviewed. Further to this, the approach aligns to the methodology adopted by Brazil, which validates its occupational predictions against those of the USA, Canada, Australia, New Zealand, and the UK. The Elsevier Scopus database defines the skills

trajectory of the countries that have digitally transformed enabling alignment of the South African food and beverages manufacturing sector.

The Elsevier Scopus database contains publications from other acknowledged publishers such as IEEE, Taylor and Francis, Wiley, and Emerald Insight. Thus, Elsevier Scopus is a comprehensive source for publication on skills. The Elsevier Scopus database contains peer-reviewed abstracts on various knowledge areas spanning from engineering to health science to social science. For each abstract, the bibliographic details, citation information, publication references, and the link to the publisher are provided. The Elsevier Scopus database is filtered for publications on skills, which serves as the big data for analysis. The text mining BDA technique adopted comprises data acquisition, pre-processing, processing, and presentation, as illustrated in Figure 1.

FIGURE 1. BDA APPROACH



Source: own compilation

- **Data extraction**

The data is extracted from Elsevier Scopus for a period of 20 years from 1999 to 2020, with the search term “skills/skill” in the title, the keywords, and abstract fields. The inclusion criteria for the search were for publications in English only.

- **Filtering of data per year**

Utilising the “analyse results” functionality in Elsevier Scopus, the publications were filtered per year.

- ***Classification of data per subject area***

For each year the publications were further classified per subject area, as per the subject area analysis in the “analyse results” functionality. The subject areas include social sciences, psychology, medicine, engineering, computer science, business management and accounting, nursing, health professionals, energy, and chemical engineering, among others. This enabled analysis of the evolution of research in a particular area, indicating growth (increased publications) or decline (decreased publications). An increase in publications in a subject area, indicates an increased focus on said subject area, driven by advancements, and technological innovation. A decrease in publications in a specific subject area, indicates waning interest or a divergence to a specialised interest or a new subject area driven by disruptions such as the global financial crisis in 2010, COVID-19, or the fourth industrial revolution.

- ***Downloading of abstracts and keywords***

Elsevier Scopus has a limitation of a maximum download of 2,000 abstracts and associated citations and bibliographic information per filter. The filters include newest publications, oldest publications, highest cited, lowest cited, relevance, the first author (A-Z), first author (Z-A), source title (A-Z), and source title (Z-A). For each filter, the first 2,000 publications were downloaded to obtain a comprehensive publication list per subject area per year.

- ***Formatting of data to Atlas format***

The abstract, author keywords, and abstract keywords extracted from Elsevier Scopus in CSV format were converted to Microsoft Excel format, which is compatible with Atlas.ti. The data extracted for each of the filters (per subject area per year) were merged and duplicates removed.

- ***Atlas cleaning***

For each year, per subject area, the extracted abstracts were analysed to produce a word list and associated word count, with the results exported to Microsoft Excel. Similarly, a count of the occurrence of the author keywords (per year) was also conducted.

- ***Data cleaning***

The abstract and author keyword count lists were cleaned to remove duplicates, This was followed by removal of stop words such as is, the, and that. This was proceeded by the aggregation of synonyms and plural forms of the same word.

- ***Filtering of word count results***

For each of the word count lists (abstract and author keywords), words having a count of less than 50 per year were removed.

- ***Data structuring***

Each word count list was transformed into a $n \times m$ data matrix, with n representing the year, and m representing either the abstract keyword list or the author keyword list. The $n \times m$ data matrix detailed the count of either the abstract keyword or author keyword per year.

- **Data interpretation and visualisation**

Each matrix was individually analysed in clusters of five years to determine the trends in the abstract and author keywords. Similar to the subject area count of publications, the evolution in the abstract and authors keywords indicated growth or decline. The abstract and author keywords were skills associated and, thus, were used as an indication of the skills trends and demands.

4. Results

The food and beverages manufacturing sector is a core economic activity in South Africa. The sector is in a state of transition, driven by 4IR, the COVID-19 pandemic, globalisation, and technological advancement. Thus, the ability to accurately predict and develop the appropriate skills in the food and beverage manufacturing sector is a priority. The current approach adopted by the Food and Beverages Manufacturing (FoodBev) SETA is limited and not fully representative. Thus, the BDA approach was applied to the FoodBev sector.

TABLE 2. NUMBER OF SKILLS PUBLICATIONS PER YEAR

Year	Number of Publications	Year on Year % Difference
1999	10,810	
2000	11,535	6.71
2001	12,807	11.03
2002	13,835	8.03
2003	15,789	14.12
2004	17,394	10.17
2005	20,655	18.75
2006	22,594	9.39
2007	24,588	8.83
2008	26,905	9.42
2009	29,433	9.40
2010	33,157	12.65
2011	35,310	6.49
2012	37,638	6.59
2013	41,863	11.23
2014	43,575	4.09
2015	46,286	6.22
2016	49,531	7.01
2017	53,577	8.17
2018	58,995	10.11
2019	68,093	15.42
2020	73,341	7.71
Total	747,711	

Source: own compilation

The number of publications on skills was erratic from 1999 to 2013. Since 2014, there has been a steady year-on-year (YoY) increase of 4.09% in 2014 to 15.42% in 2019. A decrease in YoY growth was observed in 2020, which is attributed to the disruption brought upon by the COVID-19 pandemic and can thus be viewed as an outlier. Applying the YoY growth pattern from 2014 to 2019, as it can be considered the normal growth trajectory, the projected YoY increase for 2020 was 15.45%, which would have resulted in 78,616 publications. Thus, the COVID-19 pandemic reduced the number of publications by 5,275.

4.1. Subject area analysis

Table 3 details the year-on-year (YoY) percentage change per subject area, for the subject areas most relevant to the food and beverages manufacturing sector. The cells highlighted in red indicate the highest (top 33%) year-on-year increase, while the cells highlighted in green indicate the lowest (bottom 33%) year-on-year decrease.

TABLE 3. TRENDS IN PUBLICATIONS PER SUBJECT AREA

Year	Year on Year % Difference									
	Engineering	Business management & accounting	Computer science	Economic, econometrics & finance	Environmental science	Agricultural & biological sciences	Biochemistry, genetics & molecular biology	Mathematics	Materials science	Decision science
2019	-	-	-	-	-	-	-	-	-	-
2000	7.33	0.77	6.47	-29.60	-13.05	-18.98	5.76	10.31	27.67	23.39
2001	16.98	2.18	12.50	30.63	6.08	6.89	2.55	38.69	31.27	0.33
2002	0.93	-2.92	3.56	-9.97	-22.28	0.56	-11.86	-10.62	1.35	-21.11
2003	6.96	5.26	8.13	11.48	13.22	21.20	8.43	9.01	15.08	36.69
2004	19.00	3.64	-28.54	1.16	-1.33	-11.99	-6.55	-3.58	-2.32	7.07
2005	4.09	0.18	45.19	2.34	-7.03	-18.43	1.11	14.94	3.68	12.89
2006	-11.12	-12.14	12.51	-11.32	0.36	8.85	25.80	20.38	-14.89	-10.56
2007	-4.56	6.04	10.33	9.70	8.27	1.61	-13.49	-3.73	-1.30	10.67
2008	-3.94	-2.28	8.17	2.14	-12.20	2.37	8.23	-3.36	-19.47	13.19
2009	-6.45	-7.05	6.27	-2.24	-1.13	6.57	6.53	10.85	7.31	-7.91
2010	1.71	0.85	4.91	25.81	-3.34	-13.46	-19.09	4.00	-25.70	-1.44
2011	-3.45	-2.78	-5.84	-12.88	10.17	24.93	10.07	7.06	-18.15	-12.94
2012	-4.01	-1.35	-2.64	10.95	9.05	-2.55	23.72	-6.71	-100.00	-6.52
2013	-5.91	1.69	-5.24	22.34	-7.64	10.43	11.53	3.92	-	-1.39
2014	3.58	-6.90	0.48	4.47	10.84	4.57	2.95	3.08	-	11.46
2015	-4.77	-1.43	6.52	-11.01	-5.14	-11.98	-4.77	4.59	-	9.26
2016	5.45	10.65	3.62	-3.76	27.82	-2.02	-11.24	7.36	-	15.68
2017	6.36	8.68	4.28	12.43	3.03	6.80	-6.27	20.58	-	16.01
2018	4.75	-10.67	4.91	-22.96	8.47	-4.62	18.73	-11.35	-	19.76
2019	11.33	6.39	12.75	-13.66	8.91	-0.92	-15.85	6.26	-	15.18
2020	-17.60	-13.03	-18.79	-8.35	27.55	-12.23	14.58	-12.69	-	-22.88

Source: own compilation

The results were analysed in clusters of five years; 2000 to 2004, 2005 to 2009, 2010 to 2014, and 2015 to 2019. The year 2020 was analysed separately, as it is an outlier due to the disruption caused by the COVID-19 pandemic. For the 2000 to 2004 period, the publications in the relevant subject areas were erratic, with no subject area having a steady increase or decline. During this period the subject areas with the highest growth were mathematics at 38.69% in 2001, followed by decision science at 36.69% in 2003, and material science at 31.27% in 2001. Advances in material sciences influence the type of packaging utilized by food and beverage manufacturers, which impacts the process and maintenance operations, operational costs, and supply chain, as potentially new suppliers would need to be sourced to enable the use of advanced food packing material options. Decision science influences the approach to decision-making, from investment to operational strategies, hence is critical to business sectors. Thus,

for this period, the key skills focus areas were decision-making, material science, and engineering, with mathematics an inherent requirement of all the aforementioned skill areas.

From 2005 to 2009, the subject areas with the highest growth were computer science at 45.19% in 2005, biochemistry, genetics, and molecular biology at 25.80% in 2006, and mathematics at 20.38% in 2006. The growth in computer science highlights the increased adoption of software in all aspects of a business.

- Human resources – For personnel information, leave, performance and training
- Maintenance – task scheduling, assets management
- Finance – invoice and payroll management

The re-occurrence of mathematics emphasises its importance as a fundamental knowledge area. Process control automation and optimization, which is fundamentally based on mathematics is a key knowledge area for personnel in the FoodBev sector, as improved control can result in significant financial, operational, and environmental benefits. The growth in biochemistry, genetics, and molecular biology publications indicated an increasing interest in genetically modified foods. This significantly impacted the food and beverage sector value chain from suppliers to the manufacturing processes to the final customer. This had ancillary effects in terms of skills requirements from operational personnel to engineers to technicians to sales and marketing.

During the 2010 to 2014 period, the subject areas achieving the highest YoY growth were multi-disciplinary at 35.03% in 2013, economic, econometrics, and finance at 25.81% in 2010, and agricultural and biological sciences at 24.93% in 2011. During this period, there was an increase in IT applications, with various systems being deployed to manage the different business operations, such as enterprise resource planning (ERP) systems to manage planning and strategic activities, manufacturing execution systems (MES) to manage operations, and plant control networks (PCN) to manage plant operations at the shop floor level. This necessitated a technically proficient workforce with multidisciplinary skills; operation personnel understanding aspects of the IT system that manages the control and instrumentation on the plant and finance personnel navigating the various functionalities of an ERP finance module. This necessitated upskilling of the current workforce, whilst those entering the workforce were expected to demonstrate a proficiency in computer skills. This increased demand in computer associated skills (both hardware and programming skills) resulted in a boom in students studying IT, IT-related, and programming qualifications. Following the 2008 financial crisis, as economies endeavoured to emerge from the economic recession, an increase in economic, econometrics, and finance publications was observed in the subsequent years. The world's population has increased exponentially in the past century in comparison to previous centuries. This has resulted in an associated increased demand for resources, including food. Newer and efficient methods of agricultural production were being developed to address the rising food demand, which has a downstream effect on the food and beverage manufacturers, as the agricultural sector is the primary raw material supplier in the value chain. Changes in raw materials may necessitate changes in the manufacturing process operations to achieve the final product quality and required throughput. This may require the adoption of new technologies, requiring the upskilling of the workforce. Thus, the increase in agricultural and biological sciences publications.

During the 2015 to 2019 period, decision science demonstrated an average 14.56% year-on-year increase, driven by the fourth industrial revolution of digitalization. Decision science, driven by BDA and artificial intelligence (AI) tools, continues to drive the demand for cognitive, critical thinking, problem-solving, analytical, and technology proficiency skills. This is especially relevant to the food and beverage manufacturers, as operations become digitalized, integrated, and “smart,” a dynamic workforce with multi-disciplinary (technical, cognitive, analytical, critical-thinking) skills are required. Environmental science also experienced significant growth during this period, with a peak growth of 27.82% in 2016. This is driven by the global climate change challenge and the goal to reduce the global temperature rise by 2.5 degrees Celsius. As the manufacturing industry is one of the key contributors to greenhouse gas (GHG) emissions, manufacturers are being legislated to reduce GHG emissions, driving the demand for green skills. The top 10 green skills required by employers in 2021, as identified by LinkedIn (LinkedIn, 2022), were sustainability, remediation, occupational safety and health, climate, renewable energy, environmental awareness, environmental health and safety, solar energy, corporate social responsibility, and recycling. Mathematics experienced significant growth in 2017 of 20.58%. This is associated with a rise in digitalization and AI, both of which are mathematically based.

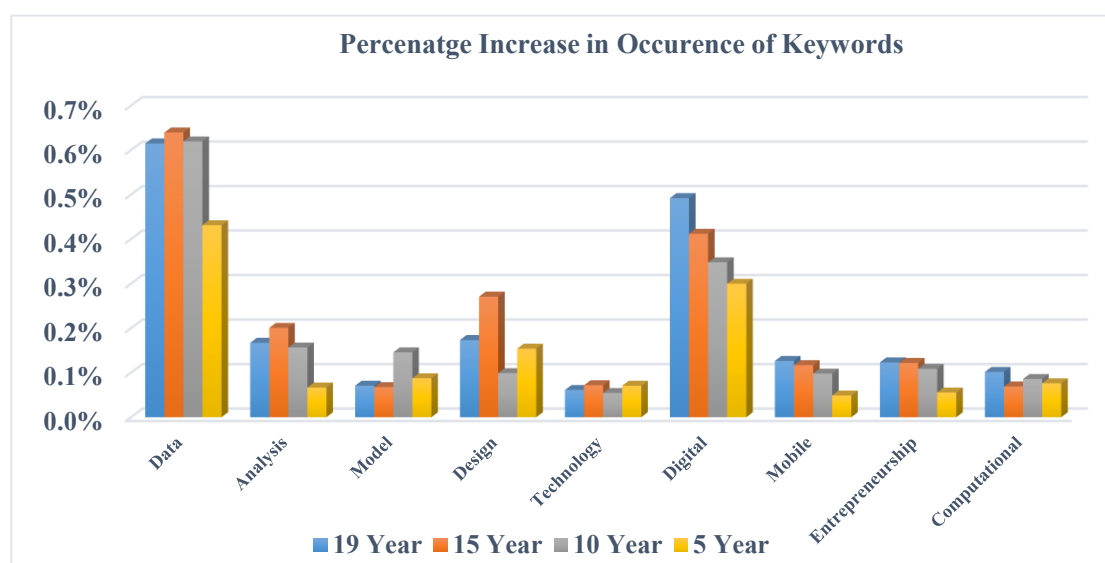
The COVID-19 pandemic disrupted the research focus in 2020, with an exponential shift to the medical sciences as evidenced by increased publications in pharmacology, toxicology, and pharmaceuticals (40.02% increase from 2019), nursing (21.35% increase from 2019) and medicine (10.35% increase from 2019). Interestingly the publications in nursing and medicine have mostly been in decline in the past 20 years. Environmental science (27.55% increase from 2019) was also a focus area in 2020.

The analysis of the change in subject areas provides a suitable indication of the skills required by the associated sectors.

4.2. Analysis of abstract keywords

The abstracts of the various subject areas were consolidated per year and a word count was executed in Atlas.ti. The word count list was cleaned to remove duplicates and stop words and merge synonyms and plurals of the same word. This resulted in a word count of 664 for the 1999 to 2019 period. The year 2020 was excluded as most publications focused on the COVID-19 pandemic, and thus an outlier. The 664 words were analysed to identify the words associated with skills specific to the food and beverages manufacturing sector. This resulted in a final count of 65 abstract keywords, which were used in the analysis. The year-on-year change in keyword count was calculated and aggregated for a period of five years (2014–2019), 10 years (2009–2019), 15 years (2004–2019), and 19 years (1999–2019). The skills-related keywords words that demonstrated constant growth across the 19-year period are illustrated in Figure 2.

FIGURE 2. INCREASING ABSTRACT KEYWORDS ACROSS THE PERIOD

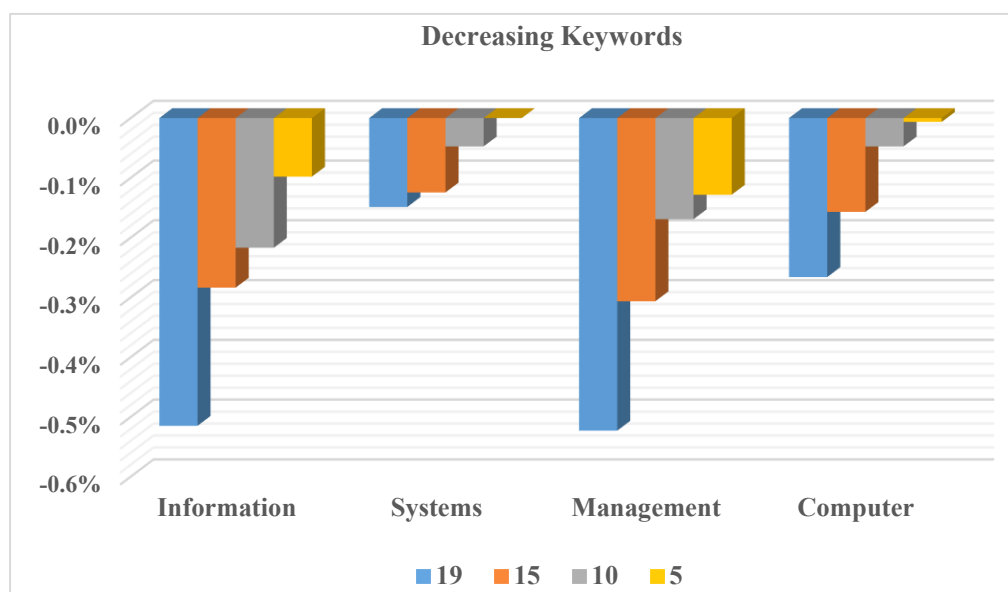


Source: own compilation

The words data and digital demonstrated the highest increases across the five-year clusters. The keyword data had the highest growth across the nineteen-year period of 0.61% followed by digital with 0.49%. The increased occurrence of the abstract keywords of data and digital during the 1999 to 2013 (15 year) period were driven by automation (partial), process optimization, and increased information, and communication technology (ICT) application, while 4IR drove the increase in the last five years. The slower growth in the last five years is attributed to the increased and specific applications of data and digital, resulting in more detailed descriptions of AI, machine learning, natural language processing, robotics, virtual reality, etc.

Similarly, for the 1999 to 2013 period, the increased occurrence of the words analysis, model, design, technology, and mobile were driven by automation (partial), process optimization, and increased ICT application, while 4IR drove the increase during the 2014 to 2019 period. SME growth and sustainability are key drivers of the economic growth of a country. Hence, the skills required by entrepreneurs and SMEs are critical. SMEs and entrepreneurs, especially in developing countries like SA, have limited access to resources (finance, time, people, and skills) to harness the full potential provided by the fourth industrial revolution, thus digital skill enablement of SMEs is critical. The analysis of the abstract keywords defines that skills development initiatives should be focused on (1) data gathering, handling, and analysis, inclusive of AI and modelling, (2) digital tools and technologies, (3) cognitive and critical thinking skills, and (4) digital enablement skills of SMEs. This information can be strategically used by the FoodBev SETA to plan its mandated annual and five-year skill interventions and initiatives for the sector.

FIGURE 3. DECREASING ABSTRACT KEYWORDS ACROSS THE PERIOD



Source: own compilation

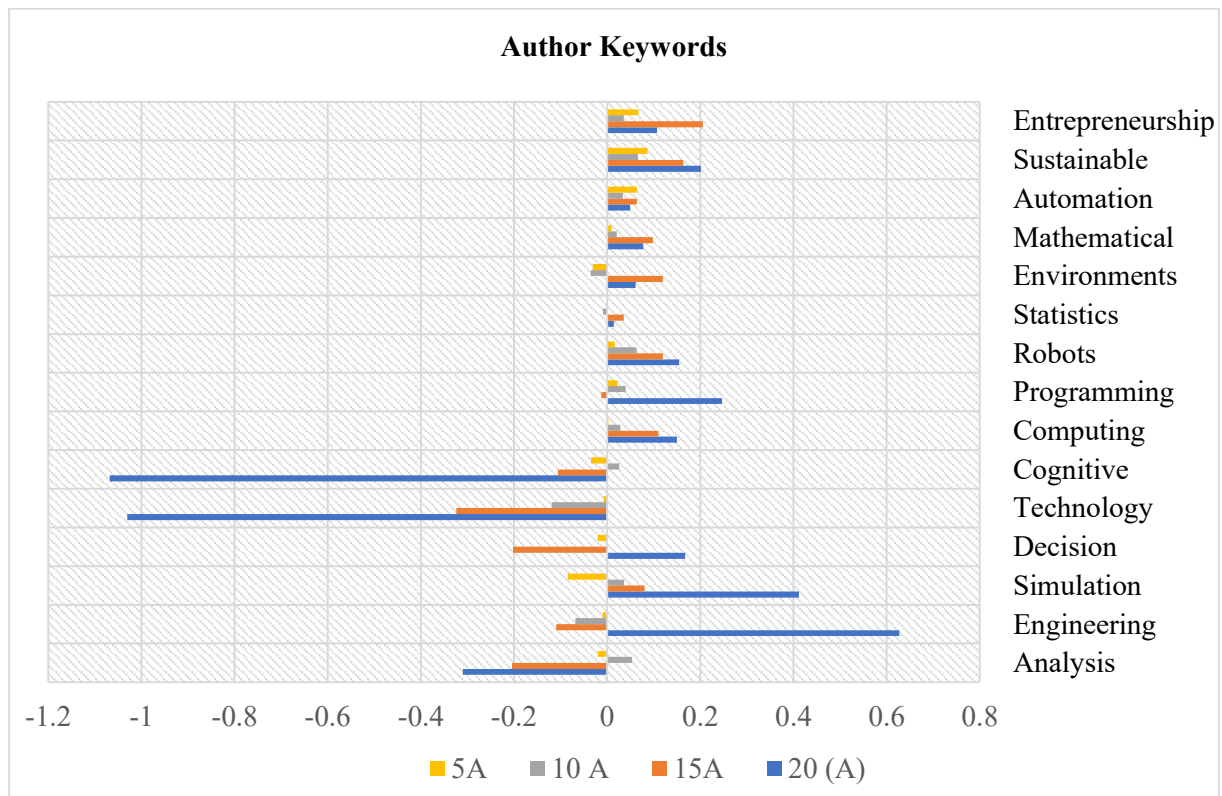
Figure 3 illustrates the skills-related words that have been in continuous decline during the 1999 to 2019 period. The declining abstract keywords are generic, and applicable to a wide range of subject matters, contributing to its decline, as skills and occupations are currently specific and specialised. Past job postings define a broad skills category, such as computer programming skills, but current job postings are highly specific, such as programming skills in Python, data analytic skills in natural language processing, or blockchain skills.

4.3. Analysis of author keywords

Articles indexed in Elsevier Scopus have keywords defined by the author, which are referred to as author keywords. The process, as explained for the abstract keyword analysis is followed for the author keywords. The key difference is that the analysis of the author keywords includes the results of 2020, as consistency in results were observed. The percentage sum of the YoY change is analysed in periods of five years (2015–2020), 10 years (2010–2020), 15 years (2005–2020) and 20 years (1999–2020), with the results presented in Figure 4.

Sustainable is a broad term that is applicable to various areas, from health and the environment to society. Sustainable or sustainability is synonymous with climate change, a global challenge. The manufacturing sector is one of the largest emitters of greenhouse gases, the key contributor to global warming, and is strictly regulated in terms of permissible volumes of greenhouse emissions. Thus, the manufacturing sector, inclusive of the food and beverages manufacturing, is continuously improving operations, from the adoption of new technologies to cleaner production initiatives to 4IR to lean manufacturing, to reduce environmental impacts towards sustainable operations. Hence, skills associated with environmental impact reduction and process optimization such as cleaner production, green economy, circular economy, value chain optimization, six sigma, lean, and total quality management are in demand. Sustainable is also closely aligned to environmental science, a subject area that has shown significant growth since 2016, as detailed in the subject area analysis.

FIGURE 4. TRENDS IN AUTHOR KEYWORDS ACROSS THE PERIOD



Source: own compilation

The keywords of technology, cognitive, and analysis demonstrate a notable decrease during the 1999 to 2020 period. As ICT and 4IR adoption rapidly expands, the generic terms of technology and analysis are being replaced by specific technology applications and analysis techniques. Technology applications include Internet of things (IoT), robotics, cyber-physical systems, and virtual reality, while analysis techniques include natural language processing, supervised and unsupervised learning, decision forest and machine learning. Similarly, for the word cognitive, employers are looking for specific skills sets in relation to the ability to analyse, interpret, and visualise. Engineering as an author keyword has been in decline for the last 15 years, which could be attributed to the use of specific application terms such as genetic engineering, 3D and 4D printing, and robotic engineers.

The analysis of the subject areas, abstract keywords, and author keywords are interpreted to identify skills for the food and beverages sector, demonstrating the practical application of the approach. The skills identified for the FoodBev sector from this analysis include:

- **Entrepreneurship:** Inclusive of digital skills to support the growth and development of SMEs. This is especially relevant to the food and beverages sector, as it comprises 90% of SMEs.
- **Data analytics:** Data gathering, cleaning, analysis, and visualisation, inclusive of AI, simulation, and modelling.

- Digital tools and technologies application: Implementation and operational skills for various technologies such as IoT, virtual reality, 3D printing, and cyber-physical systems.
- Sustainable operations: Process optimization includes green technology implementation and operation, as well as energy, water, and resource optimisation.

To validate the findings of the study, the results are compared to the increasing jobs and the top 10 skills for 2025 as identified by the World Economic Forum (2020). The WEF findings are detailed in Table 4.

TABLE 4. TRENDS IN JOBS AND SKILLS (WEF, 2020)

Increasing Job Roles	Top 10 Skills for 2025
Data analysts and scientists	Analytical thinking
AI and machine learning specialist	Active learning and learning strategies
Big data specialist	Complex problem solving
Digital marketing and strategy specialist	Critical thinking and analysis
Process automation specialist	Creativity, originality and initiative
Business development specialist	Leadership and social influence
Digital transformation specialist	Technology use, monitoring and control
Information security analysts	Technology design and programming
Software applications developer	Resilience, tolerance and flexibility
Internet of things specialist	Reasoning, problem solving and ideation

Source: World Economic Forum (2020)

This study identified the skills of data analytics and digital tools and technologies application as important. This is validated by the WEF findings as all the increasing job roles (as per Table 4) require the skills of data analytics and digital tools and technologies application to some extent. Further to this, the aforementioned skills are aligned with the skills of analytical thinking, complex problem solving, critical thinking and analysis, technology use, monitoring and control, and technology design and programming (as per Table 4).

A comprehensive entrepreneurship skill set would include the skills of leadership and social influence, creativity, originality, and initiative. Similarly, a comprehensive sustainable operations skills set would require the demonstration of the use and application of relevant technologies, applicable monitoring and control capacities and reasoning, problem-solving, and ideations. The alignment of the study findings to the World Economic Forum 2020 report on skills (World Economic Forum, 2020) support the proposed BDA approach for skills prediction.

The identifications of the skills demand of the sector enables the FoodBev SETA, HEIs and government to strategically plan initiatives. This would aid a proactive approach, a shift from the current reactive approach. These initiatives include the bursaries to offer, training programmes to be developed, existing training programs requiring updating, upskilling programmes for the current workforce, and required partnerships. The training programmes and partnerships should facilitate practical training, workshops, and short courses at a minimum. While this would be essential steps in addressing the current skills mismatch and high youth unemployment it is an initial point, as addressing the skills gap is a long-term strategic effort from all stakeholders in the skills ecosystem.

4.4. Assumptions, Limitations, and Bias

A key assumption made is that Elsevier Scopus provides a comprehensive source of data that can be analysed to derive findings. This is based on Elsevier Scopus having 330 disciplines, over 7000 publishers, over 24.6 million open access items, over 368 000 books, and 97.3 million records (Elsevier Scopus, 2025).

The limitations of the study include:

- A single source of information was adopted for the BDA analysis. Utilising multiple sources of information would provide a more comprehensive and holistic understanding of the skills ecosystem. This would be essential in developing a skills ecosystem that is interconnected and dynamic, towards better informed policy and decision making.
- The focus is on the South African Food and Beverage Manufacturing sector only, this would inherently neglect some of the skills requirements of the other sectors of the South African economy. Thus, an economy wide skills approach is recommended as the work force is not restricted to a specific sector.
- The review was limited to publications in the English language only.

Bias is usually present in small to medium sample sizes and has a high prevalence with non-peer reviewed sources. For this study, our sample is every available paper amounting to 747,711 publications, which is a huge sample. We further only used peer reviewed sources implying good data. The subject areas were as determined by Elsevier Scopus, while the keywords utilised were author and index keywords as defined by the authors and the journal respectively. With the above in mind, we declare limited to no bias.

5. Conclusion

Skills determination, current and future, is essential for the economic growth of a country. South Africa, a developing country, is experiencing one of the highest unemployment rates globally. The high unemployment rate intersection with poverty and social decline, necessitates a response. One of the key contributors to high unemployment is the skills mismatch; the mismatch between the graduate skills set and workplace demand. To strategically address this skills mismatch, both current and future, the skills demand must be accurately predicted. The current SA approach is fragmented, as it is per economic sub-sector via the respective SETAs, with no integration to provide an economy-wide perspective on skills requirement. Further, the SETAs approach, based on the analysis of submitted work sector skills plans, by the companies within the sector, is limited.

The skills forecasting models of countries that have been successful in predicting skills demand were analysed. The challenge of these forecasting models is the data requirements, extended periods of data, and the quality of the data. This is especially challenging for developing economies, where data availability and associated quality may be limited.

This study adopted a BDA approach, to predict the SA skills need. The approach entailed extraction of skills related publications from the Elsevier Scopus database, an established peer-reviewed academic database. The publications were extracted and analysed in three categories of subject area evolution, abstract keyword occurrence and author keyword occurrence. This

was done to identify the skills demand of the food and beverages manufacturing sector. The skills associated publications for the 1999 to 2020 period were downloaded and analysed. The results were disaggregated per year and analysed in clusters of five years based on YOY change of keywords. The interpretation of the results identified four key areas of skills demand for the South African food and beverages manufacturing sector: 1. entrepreneurship skills inclusive of digital skills; 2. data analytics inclusive of AI, simulation, and modelling; 3. digital tools and technologies implementation, and operational skills; and 4. sustainable operations skills of advanced process control, of energy, water, and resource optimization. The results obtained were compared to the findings of the World Economic Forum 2020 report on skills and was found to align (World Economic Forum, 2020). Further, the skills of sustainable operations align to the findings of the LinkedIn report on global green skills (LinkedIn, Global Green Skills Report, 2022). The proposed BDA approach is generic and can be applied to any of the 21 SETAs in South Africa.

Skills forecasting is essential in reducing the youth unemployment in South Africa. The ability to define future skills planning, enables proactive planning and collaboration by stakeholders in the skills ecosystem. This proactive planning and collaboration will enable the youth to develop the required skills at the appropriate time, facilitating employment. Skills forecasting will enable HEIs and SETAs to strategically plan skills initiatives such that it meets the needs of the required position from artisan to engineer to manager instead of a one fit all skills approach. This would lead to a workforce that is adaptive and sustainable.

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We Have Enough Neurotypical Thinkers Already: Why Accommodating and Developing a Neurodiverse Workforce is the Right Strategic Approach to Navigating the Fourth Industrial Revolution

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Abstract

With the development of advanced technologies such as Large Language Models (LLMs), 3D printing, the Internet of Things, blockchain technologies, advanced robotics, material ecology and driverless vehicles, the requirements from the workforce of the future will be significantly different from the workforce we have today. This paper explores the potential for organisations to proactively manage this problem by adopting an approach that accommodates a neurodiverse workforce more effectively. Placing the fourth industrial revolution and volatile, uncertain, complex, and ambiguous (VUCA) economy in a broad historical context informs the discussion on why and how this accommodation may be effectively achieved. This paper adds to the knowledge by identifying positive correlations between the emerging labour market and the underleveraged potential of neurodiverse employees. In addition to its constructive recommendations to employers and educators, this paper offers positive guidance to young neurodiverse people entering the labour market.

Keywords/key phrases: VUCA, neurodiversity, Industry 4.0, workplace accommodation, organisational strategy

1. Introduction

We exist in an era of rapid change and global uncertainty. Long-held assumptions are being challenged for individuals and organisations, and many old certainties no longer hold true. The pace and extent of the changes made possible by rapid technological advancement and the enabling capacity of neoliberal orthodoxy are unprecedented. In 1955, in response to escalating geopolitical tensions that seemed similarly unpredictable and intractable, the philosopher Bertrand Russell and scientist Albert Einstein co-authored a letter with a simple exhortation for its readers, “We have to learn to think in a new way” (p. 2).

This perspective paper will draw upon a broad range of extant literature to propose a thoughtful, inclusive, and forward-looking approach to employing neurodiverse individuals in response to the evolving challenges of the fourth industrial revolution. Narula (2024, p. 253) writes that “perspectives papers are intended to be ‘high impact’ and should have the potential to institute (or at least catalyse) new lines of enquiry. They can be a very powerful and useful way to influence the field at large”, which is this article's intention. In keeping with this intention, while being academically rigorous, this paper is intended to be accessible and helpful to policymakers, thought leaders, businesspeople, and particularly for young people who identify as neurodiverse.

The first section of this paper is a literature review. Given the sheer breadth of literature available (over 400,000 academic journal articles on ADHD alone), this is not a comprehensive review but offers a representation of contemporary understandings of work and neurodiversity. The literature review opens with a broad review of the scholarship on the evolution of work and the future direction(s) that are considered possible and likely. In this section, the workplace of the future is considered from the perspective of both organisations and employees. This is followed by a review of the literature on neurodiversity and the challenges experienced by (and advantages uniquely available to) neurodiverse people. Following this is a discussion of the intersection of these two bodies of literature and the positive correlations and opportunities that arise from this. The concluding section of the paper reflects Narula's (2024) call to catalyse enquiry by positing specific recommendations for effectively accommodating and developing a neurodiverse workforce.

2. Literature Review

The literature presented in this review is representative of the author's reading of the literature identified on Google Scholar and ResearchGate. Other than where contextually appropriate or to draw attention to seminal scholarly work, more recent works have been cited (Paul et al., 2021), and non-Eurocentric voices have been highlighted as a decolonizing research methodology (Thambinathan & Kinsella, 2021).

2.1. Work

2.1.1. The Fourth Industrial Revolution

Although it has been used in academic literature since the 1990s (for example, by Monlouis, 1998; Smith, 1999; Takeda, 1991), the term ‘Fourth Industrial Revolution’ (which is used interchangeably with ‘Industry 4.0’, particularly in the tech industry) entered the mainstream as the title of a 2016 book by Klaus Schwab, the Founder and Executive Chairman of the World Economic Forum. The conceptualisation of Industry 4.0 is that rapid advancements in advanced technologies will fundamentally realign global economic modes of production and, consequently, the work humans are required to do. In the brief time since the publication of this book, the widespread adoption of Large Language Model (LLM) technologies has intensified the pace of change beyond the predictions of Schwab's book. Indeed, some theorists argue that such is the seismic shift that we may already be experiencing a fifth industrial revolution (see, for example, Chakir et al.'s 2024 book entitled "Industry 5.0 and Emerging Technologies: Transformation Through Technology and Innovations"), which seeks to complement and extend the theories related to the concept of Industry 4.0.

The first ‘industrial revolution’ was the transition of humans from foragers to farmers some 10,000 years ago. This reconceptualization of the human role from consumer to producer is unparalleled in the animal kingdom and created defined roles for humans using animals and rudimentary tools

to produce, transport and distribute foods necessary for survival (Barker, 2006). In the mid-eighteenth century, a second industrial revolution was catalysed by the construction of railroads and the invention of the steam engine. At this point, machine power begins to supplant human (and animal) muscle power, which, again, recasts the role of human workers as complementary to more powerful – and, at scale, cheaper industrial engines (Zhang & Yang, 2020). The third industrial revolution began with the harnessing of electricity and the development of the production line model, which further removed humans from direct production to ancillary tasks and created the resource capacity for the so-called knowledge economy to develop (Mohajan, 2021).

Xu et al. (2018, p. 91) write that “a Fourth Industrial Revolution is building on the Third, the digital revolution that has been occurring since the middle of the last century. It is characterised by a fusion of technologies that is blurring the lines between the physical, digital, and biological spheres.” The development of technologies such as 3D printing, the Internet of Things, blockchain technologies, advanced robotics, driverless vehicles, material ecology and, as mentioned previously, LLM technologies offer the potential to reimagine organisations completely, eliminating entire professions (Wang, 2023), enabling rapid prototyping (MacDonald et al., 2014), and disrupting long-established macroeconomic norms (Zubair et al., 2023). Indeed, the potential for developing Artificial General Intelligence (AGI), a technology that can learn autonomously beyond human capacity and iteratively improve itself, threatens to supersede even these advanced technologies. However, it is speculated that this development is unlikely to emerge until some point between 2040 and 2070 (McLean et al., 2023). Inevitably, the disordered and rapidly evolving nature of the economy will continue to evolve at a disorienting pace for the foreseeable future, and the skills needed to navigate this landscape will be of ever-greater importance.

2.1.2. The History of Work and Dialectical Materialism

Rapid and fundamental shifts in the means of production within capitalist economies derive from, respond to, and inform broader social and economic contexts, which are perpetually evolving from and responding to external factors and their internal contradictions. Marx and Engels described this process as dialectical materialism, and this conceptual framework underpins their various works that examine capitalism, production, human nature, society, and the economy (Spirkin, 1983).

The history of work demonstrates the responsiveness of humans to the environmental and technological advancements of their age. From the organisation of Guilds to regulate the access of workers to lucrative trades in the medieval era (Ogilvie, 2014) to the rise of organised labour in response to the industrialisation of production in the late Victorian era (Ackers, 2015), humans have been an active participant in these dialectics. The most famous specific example of a human response to technological innovation was the Luddites’ destruction of the textile machinery that would end their skilled employment and undermine their ability to provide for their families. While the phrase Luddite is now “a handy term of derision” (Linton, 1992, p. 529) that is synonymous with an ill-considered hostility to technical innovation, the Luddites, in fact, offered a planned and viable alternative model to extractive capitalism, where a few become rich, but many starve (McGowan & Geobey, 2022). The Luddites stood, as we now stand, at a crucial inflexion point in the history of industrial production and responded by offering a vision of a different and more human-centred path forward. Westley et al. (2013) argue that individuals and groups have agency within social-ecological systems to effect change and bring about a sustainable future by shaping our working context just as the Luddites attempted to and as this paper urges its readers to do.

2.1.3. COVID-19 and its Disruptive Influence on Work

The COVID-19 pandemic and particularly the measures introduced by governments to balance the necessity of mitigating harm to public health with the political imperative to maintain economic activity, produced the most significant single upheaval to work since the Second World War (Collins, 2023). In addition to highly visible changes, such as the rapid implementation of working from home where possible (Pichler, 2023) and government subsidisation to prevent mass unemployment and company liquidation (Dörr et al., 2021), there were more subtle though equally profound changes such as the definition of an ‘essential’ worker (Collins, 2023), the negative impact on employees trust in managers and organisations (Drange et al., 2023) and the highly disrupted social and educational formation of a generation of future employees (Schoon & Henseke, 2023). While further investigation of these phenomena is outside the scope of this paper, it is necessary to remain cognisant that workplace relations and established employment norms are emerging from an unusually fractious period, even without the disruptive influence of the technologies driving the fourth industrial revolution.

2.1.4. The Fourth Industrial Revolution and the Future of Organisations

The apparent rapid advancements of generative AI (LLMs) create great uncertainty for organisations aiming to plan for the medium and long term. Accounts of the impact of these technologies range from “one-third of today’s jobs will disappear by 2025” (Pauceanu *et al.*, 2020) to “automation promises a future of higher income that stems from the higher productivity that artificial intelligence will provide” (Stevenson, 2019). Some commentators in tech journalism argue that the inevitability of an epochal shift resulting from LLM technology has been overstated due to the tremendous expense and inconsistent productivity inherent in these models limiting their cost-effectiveness (Bender & Hanna, 2025; Epstein, 2024; Zitron, 2024). The same arguments, however, contain the subtext that so much resource and goodwill have been directed towards LLM technology by monopolistic tech giants that the investments made will not be allowed to fail (O’Donnell, 2024). Indeed, while the impact of these innovative technologies remains far from certain, we can be assured that the race to be at the forefront of these technologies is accelerating. The Financial Times wrote in August that the \$100bn invested by big tech firms in 2024 was “just the beginning” (Morris *et al.*, 2024). Fosso Wamba et al. (2023) explain that empirical literature on the challenges faced by organisations is limited and where it does exist (e.g., More, 2024; Rane et al., 2024; Sanyal & Sathis Kumar, 2025) the findings are speculative drawing on data generated from older iterations of LLM models. For business leaders, the likelihood is that operating models will be significantly altered, the requirement for human resources will diminish, and changes will be possible at short notice, making long-term planning an exercise in profound uncertainty.

2.1.5. Origins of the VUCA Economy and the Future of Work

For organisations removed from the race to develop innovative technologies but having to prepare for their impact, the oft-used definition of the economic climate as volatile, uncertain, complex, and ambiguous (VUCA) could not be more apt (Bennett & Lemoine, 2014). While the future for organisations is uncertain, the future is rather more predictable for individuals who operate within the labour market. The VUCA economy is not, it should be made clear, a consequence of either the fourth industrial revolution or the COVID-19 pandemic; it is a product of political decisions and social changes over the last fifty years. The large-scale shift from production-based to knowledge-

based work in developed countries driven by globalisation and automation disrupted established industrial relations models and stratified the working-age population (Hyman, 2007). The erosion of human input into physical production processes and legislative attacks on workplace collectivism under successive governments weakened the ability of workers to exert power through the organised withdrawal of labour (Bean, 2021), which led, in turn, to a systemic weakening of employment rights and protections (Visser, 2023).

At the same time, a dramatic increase in the labour supply as women, immigrants, and older people sought employment (Grabarski & Schwartz-Asher, 2022) further eroded the bargaining position of workers. The era of neoliberalism, beginning with the election of Thatcher in the UK in 1979 and Reagan in the USA in 1980, saw widespread legislative reforms to reduce regulatory oversight of organisations under the now-discredited pretext that strong economic growth would trickle down to enrich everyone (Greenwood & Holt, 2014). One of the architects of neoliberal economics and a key advisor to Reagan, Milton Friedman, had argued as early as 1970 that the only social responsibility of a business is to increase its profits. Consequently, the promised ‘trickle-down’ effect did not happen as consistently strong economic growth generated higher profits and exacerbated socioeconomic inequalities (Stiglitz, 2019). For employees, these neoliberal policies have resulted in wage stagnation, weakened employment protections, fewer ‘quality jobs,’ and increased precarity of employment (Greenstein, 2020). A key feature in the shift in employment relations came the breakdown in what is called the ‘psychological contract’ in which firms offer job security in return for employee loyalty (Baruch & Rousseau, 2019) with the consequence that “individuals could not expect or rely on the organisations to manage their careers anymore” (Grabarski & Schwarz-Asher, 2022, p. 4). Consequently, career development and skills acquisition became something that individuals became required to pursue outside of their employment and at their own expense to gain a labour market advantage. For educators, this desire for individuals to develop employment capital is reflected in the heightened attention paid to graduate employability and job-readiness as a desirable outcome of higher education (Fellows, 2023) in preparation for a labour market dominated by “skills-biased-technological change” (Means, 2017, p. 252).

For individuals working in the VUCA economy, the future is widely expected to be characterised by increased precarity, portfolio careers, multiple profession changes, short-term contracts, and career shock events (Hite & McDonald, 2020). In this context, the employability skills necessary for career success have evolved. New concepts such as grit, resilience and context adaptation are now considered necessary along with more traditionally recognised attributes such as teamwork, problem-solving, and effective communication (Fellows, 2024).

2.2. Neurodiversity

2.2.1. The Term ‘Neurodiversity’

There are critiques of the term neurodiversity and its implications (see, for example, Maynard (2024), Russell (2020), and Nelson (2020)). However, the current consensus in the literature favours the use of the term. Therefore, neurodiversity is used here with the acceptance that this may be terminology that falls out of favour or is superseded in the years ahead. It is also acknowledged that the extends to include conditions beyond the most widely researched conditions (autism, ADHD, and dyslexia) to include hyperlexia (Grigorenko et al., 2022), developmental coordination disorder

(Castellucci & Singla, 2025), Tourette syndrome (Johnson et al., 2023), obsessive-compulsive disorder (Blanco-Vieira et al., 2023) and bipolar disorder (Nierenberg et al., 2023).

2.2.2. Awareness of Neurodiversity

While there is disagreement on when the term neurodiversity first entered the academic literature, awareness of the term and, more importantly, the concept of neurodiversity has been a subject of discussion within impacted communities since at least 1996 (Botha et al., 2024). Neurodiversity is an umbrella term encompassing “neurodevelopmental disorders that are considered variations of the brain and ... may include sensory processing, facial recognition, visual imagery, attention, and coordination. Strengths can include empathy, creativity, visual perception, and memory. It is important to note that, as well as neurodiversity being a spectrum, there is a broad range of cognitive profiles within each of the neurodiverse disorders themselves” (Johnson & Ahluwalia, 2024, p. 1). The understanding that neurodiverse individuals benefit from different and specifically designed accommodations is derived from the Social Model of Disability (SMD), which was defined initially by Oliver (1982, p. 31) as “a switch away from focusing on the physical limitations of particular individuals to the way the physical and social environments impose limitations upon certain groups or categories of people”. In the period since 1982, there have been legislative developments to enshrine and protect the rights of neurodiverse individuals in countries across the globe, though the effectiveness of the legislation is disputed (Nisco, 2024; Pinilla-Roncancio & Rodríguez Caicedo, 2022; Ruppel, 2024). In recent years, social and medical understanding of neurodiverse conditions has developed with more inclusive criteria and greater awareness, leading to an increase in the volume of diagnoses and a particular increase in previously under-diagnosed communities such as girls and adult women (Johnson & Ahluwalia, 2024).

2.2.3. Deficit-based Medical Perspectives of Neurodiversity

Traditionally, diagnoses of neurodiverse conditions have been framed from a deficit-based perspective that defines the neurodiverse individual by the attributes or characteristics that are lacking or less pronounced than is true for non-neurodiverse (neurotypical) people (Brown et al., 2021; Climie & Mastoras, 2015; Davis & Deponio, 2014). Bottema-Beutel et al. (2021, p. 8) argue that this deficit-based medical model of understanding situates neurodiversity (specifically autism in their paper) as inherently inferior and prompts language indicating that they “lack something fundamental to being human” with the inevitable outcome of the condition being seen as “something to be fixed, cured, controlled or avoided”. The pathologisation of neurodiverse conditions from a deficit-based perspective plays a critical role in the experiences of neurotypical people as these dominant narratives are “heard and internalized by families, autistic children and society as a whole” (Brown et al., 2021, p. 1171).

2.2.4. Socially Constructed Understanding of Neurodiversity

In a Forbes article entitled ADHD: The Entrepreneur’s Superpower, psychiatrist Dr Dale Archer argued that “in our over-diagnosed, over-medicated culture, we choose to only focus on the negative aspects of ADHD” (2015); this is a clear representation of how, even where a highly qualified person intends to convey positive advocacy, the socially constructed understanding of neurodiversity has such a deleterious impact. Stereotypes of neurodiverse people are often based on popular culture, for example, the 1988 film *Rain Man*’s depiction of autism (Grey, 2020) or inaccurate representations in news media, including ADHD being “the

consequence of poor parental, school discipline, diet or lifestyle” (Horton-Salway, 2011, p. 545) with the consequence that society perceives neurodiverse conditions as being “at odds - to varying extents - with both wellbeing and flourishing and hence incompatible with both objective and subjective conceptions of the good life” (Chapman & Carel, 2022, p. 2). Such is the negativity around neurodiversity that exists in society at large that the diagnosis of a child can be experienced as “intense distress akin to grief” (Brown et al., 2021, p. 1171) by the child’s parents, though it has been over thirty years since Sinclair’s (1993) article ‘Don’t Mourn For Us’ had first challenged this damaging narrative.

A key aspect of the socially constructed understanding of neurodiversity is a common overestimation of the capability of neurodiverse people or the ability of those people to leverage the strengths associated with their conditions without adequate accommodations. Scholars argue that these misconceptions are based on the overrepresentation in popular media of uncommonly gifted outliers such as iconic entrepreneurs Elon Musk (autism), Richard Branson (dyslexia) and James Dyson (ADHD) (Brown & Fisher, 2023). Consequently, many people tend to underestimate the true impact of neurodiverse conditions upon people, a phenomenon characterised by Barkley thus: “Adult ADHD is one of the most impairing disorders we treat on an adult outpatient basis, and people think it’s just some trivial little problem that a cup of Starbucks is going to solve” (Ward, 2022).

2.2.5. An Alternative Paradigm for Neurodiversity

Milton (2012) offered a distinct perspective on neurodiversity when he posited that the double empathy problem presents a different paradigm for neurodiversity. One of the consequences of the combined impact of the medical and socially constructed paradigms of neurodiversity is attributing the blame for misalignments of perspective to the neurodiverse individual as the one who is impaired. The ‘double empathy problem’ concerns “a breakdown in mutual understanding (that can happen between any two people) and hence a problem for both parties to contend with”; however, when one of the people is autistic the breakdown is “primarily framed in terms of [autism being] a social communication disorder, rather than interaction between autistic and non-autistic people as a primarily mutual and interpersonal issue” (Milton, 2022, p.1901). As Murray (2024) argues, “it makes no sense to claim that autistic people have impaired empathy, not once you realise that we autistics have no more trouble empathising with non-autistic people than they have in empathising with us”.

In the neurodiverse community, this negative framing is subverted with the satirical “neurotypical personality disorder”, in which the traits that are common differentiators for neurodiverse individuals are norms from which neurotypical individuals diverge, for example, the neurotypical individual “Blindly follows social conventions without even pondering if those are good for their being or even useful at all” (Sefsermak, 2011). The academic approach taken by Milton (2012) and the informal, experience-informed social commentary of “neurotypical personality disorder” highlight the pervasive and unspoken norms of othering that neurodiverse individuals experience when, in fact, the situation is often reciprocal and accommodating neurodiverse individuals is both mutually rewarding and socially just.

2.2.6. Neurodiverse People Entering the Workplace

The labour market of the 21st century will be directly impacted by the VUCA economy, with a higher incidence of career shocks, portfolio working, and short-term freelance contracts (Pauceanu et al., 2020). For neurodiverse people, entering this environment will present additional challenges when reasonable accommodations to enable their employment centre around lessening ambiguity and uncertainty (Bruyere & Colella, 2024). While theorists in Human Resource Management have identified that the strengths that neurodiverse employees bring are essential in navigating a VUCA economy (Kune, 2024), employers remain mostly unwelcoming to neurodiverse employees “expecting the same support in the workplace that they received for such conditions at school or university.” (Ring, 2024). Emphasising this point, the provision of accommodations for neurodiverse students offered by schools and universities has been described as “a disservice to employers” because “at a certain point, we all have to accept that life is just irremediably unfair” (Noia, 2024).

In response to the demands of the labour market in a VUCA economy, contemporary accounts of employability emphasise “desirable characteristics such as grit (Ismail et al., 2023), resilience to career shocks (Khannas et al., 2022) and context adaptation (Coetzee & Engelbrecht, 2019) ... alongside more traditionally recognised employability skills such as problem-solving, communication, and team-working (Tushar & Sooraska, 2023)” (Fellows, 2024). In this context, the responsibility for navigating hostile workplace environments is conceived as wholly individualised, undermining the legislative and regulatory requirements placed upon organisations. For neurodiverse people, the prospect of entering such a hostile environment for which they are not necessarily suited without support can be debilitating.

The challenges faced by neurodiverse people entering inappropriately configured working environments or being faced with colleagues and superiors who lack the necessary understanding of neurodiverse conditions exacerbate the existing barriers as the ‘blame’ for maladaptive emotional responses or difficulty understanding social interactions and implicit communications tends to be individualised rather than recognising the contributory systemic factors (Waisman-Nitzal et al., 2021).

2.2.7. Provision of Workplace Accommodations

To support neurodiverse individuals in thriving in the workplace, legislation requires employers to provide accommodations that may be deemed reasonable. Reasonable-ness is a subjective and “vague” construct (Waisman-Nitzal et al., 2021) that implies some degree of reciprocity and negotiation between employer and employee (Hickox, 2016) despite the significant power imbalance inherent in the relationship. As such, neurodiverse individuals may be placed in a position of having to advocate successfully on their own behalf or be held to performance expectations which are unreasonable without necessary accommodations (Nevala et al., 2024). A range of literature cited by Maestas et al. (2019) identified that even for long-standing and valued employees who develop a disability during their employment, there is a wide variance in the provision of accommodations by employers. Anand and Sevak (2017) found that providing accommodations that would enable success in the workplace is positively correlated with finding and maintaining employment. In other words, an individual is more likely to receive accommodations from an existing employer than a new (or prospective) employee, and even then, the provision of accommodations is highly dependent on the approach taken by the employer.

Data gathered by Bewley and George on behalf of the National Institute of Economic Research indicates “a general lack of awareness about how challenging effects associated with particular conditions could be minimised and accommodated with the right support” (2016, p. 18). Simple accommodations for neurodiverse employees that employers may make include software “that keeps deadlines, segments work objectives into smaller tasks and organizes the employee’s assignments” (Robbins & Ratajczak-Mrozek, 2017, p. 7), support for “different work hours or the ability to work from home” (Abreu, 2018, p. 6), “reporting relationships could be streamlined to eliminate confusion” (Sarkis, 2014, p. 28), and “communicating in an unambiguous manner” (Bewley & George, 2016, p. 48). Unsurprisingly, given the generally applicable nature of the accommodations suggested, “actions taken to accommodate neurodiverse people often spill over into benefits for all employees” and thus positively contribute to organisational productivity (Krzeminska et al., 2019, p. 456).

Providing appropriate support for neurodiverse employees extends beyond their employment and incorporates a broader well-being consideration. While all employees will experience challenges during their careers, neurodiverse people are subject to the additional stresses of navigating a socioeconomic environment that is not conducive to the well-being of someone with their condition (Sulaimani & Gut, 2019). Moreover, neurodiverse individuals are statistically significantly more likely to have additional, coexisting conditions “such as ADHD, learning and language disabilities, sleep disorders, impulse control personality disorders, anxiety disorders, intellectual disabilities, substance use disorders, mood disorders, and autism spectrum disorders” (Ker & Van Gorp, 2023, p. 37). For employers, providing suitable support mechanisms may appear more complex and resource-intensive than for neurotypical employees due to the individualised nature of those accommodations. For neurodiverse employees, therefore, the provision available to them is often partially suitable, subject to delays, and othering practices such as “a pre-determined checklist of modifications, facilities that underscore, rather than support, need, and disturbingly discriminatory practices such as overt labeling” (Friedman & Nash-Luckenbach, 2023, p. 1907).

Brown and Melcher (2021, p. 179) argue that many of the rapid adaptations made in response to the Covid pandemic were beneficial for neurodiverse people, offering “the ability to determine the lighting, sound, seating, and other types of sensory requirements in the learning environment” and offer a simple template for practical accommodations, but have regrettably been discarded in the rush to return to existing working practices.

2.2.8. Barriers to Employment

The transition of global economies, led by the United States, from industrialised to financialised knowledge economies (Dominguez Lopez & Barrera Rodríguez, 2023) has presented challenges and opportunities for neurodiverse individuals. LeFevre-Levy et al. (2023, p. 5) present the argument that “with increased technological advancement and automation, skills ... associated with some of the strengths of neurotypical individuals (e.g., novel thinking, creativity, computer coding, and scientific thinking) are becoming more important”, but Austin and Pisano (2017, p. 100) make the point that “the behaviors of many neurodiverse people run counter to common notions of what makes a good employee... These criteria systematically screen out neurodiverse people.” Employers who recognise how “neurodivergent people foster increased creativity, novel approaches to problem-solving, and the development of a broad skill set in organizational settings” (Tariq, 2024, p. 183) are more likely to create opportunities and

institute accommodations that enable neurodiverse employees to thrive. There are, however, occasions where the accommodations provided by employers are offered reluctantly, and many workplaces remain “unwelcoming to neurodiverse workers” (Patton, 2019). In addition, neurodiverse individuals face barriers to gaining employment due to hiring manager prejudices, systemic biases in recruitment practices, and the perceived costliness of making accommodations (Ali et al., 2024). The inevitable consequence of these barriers is that neurodiverse people experience significantly higher rates of unemployment (Office for National Statistics, 2022) and consequent social and economic disadvantage.

In a combined paper on two long-term studies, McArdle et al. (2007) identified strong positive correlations between re-employment rates among the unemployed and higher levels of self-esteem and beliefs about one’s employability. Nguyen et al. (2020) found that while autistic adults generally have lower levels of self-esteem than neurotypical individuals, this gap is significantly mitigated where the individuals have a more positive self-appraisal of autism (recognition of associated strengths and lower perceived helplessness), while Ferenc et al. (2022) found that this is a protective factor against negative self-perceptions and thus has the potential to become a virtuous circle in positive social or professional environments.

Although there are imminent threats from legislators in Western countries to roll back the progress made in recent decades, Bruyere and Colella (2024, p. 190) state that “most larger companies have Equity, Diversity, and Inclusion programs which provide awareness training. However, the issue of neurodiversity is not covered in many of these programs” indicating that broader structural barriers remain in workplaces despite social and legislative progress. In the UK, the Financial Times reported a consequent rise in employment tribunals related to discrimination due to a claimant’s neurodiversity “with 278 judgments issued by the employment tribunals in England, Wales and Scotland in 2023... compared with 193 in 2022 and just 3 in 2016” (Ring, 2024).

2.2.9. Higher Education and Neurodiverse Graduates

The increase in awareness (and diagnoses) of neurodiverse conditions has happened at the same time as a significant increase in the proportion of students in higher education globally. According to Cunningham and Samson (2021, p. 1), during this period, “universities more aggressively aimed to recruit ‘non-traditional students’... [who] had not been able to either consider university education or meet the academic entry requirements”. Inevitably, the number of students with a diagnosed neurodiverse condition has also increased significantly during the period (Clouder, 2020). However, relatively little academic attention has been paid to appropriate pedagogical responses to the needs of neurodiverse students (Cox et al., 2020; Hamilton & Petty, 2023). The structure, practices and culture of higher education are derived from a teaching tradition copied from long-established Higher Education institutions by more modern seats of learning, where non-traditional students are significantly more likely to attend (Bandow et al., 2007). As such, while educators may seek to develop innovative and student-centred approaches to teaching in their practice, they remain constrained by institutional customs and “an inbuilt distrust of radical innovation” (Nygaard et al., 2014, p.1). Higher Education has struggled to adapt effectively to the growth of non-traditional students, especially neurodiverse students (Clouder et al., 2019). The challenge for Higher Education in supporting their neurodiverse student body is exacerbated by many students deciding not to declare their diagnosis to their institution (von Below et al., 2021).

The massification of Higher Education was, of course, a political decision and, as such, has both political and economic rationalisations. It has been argued that the transition to a marketised system of provision that shifted the ultimate responsibility for funding Higher Education from the state to the individual “from a publicly financed collective good with broad educational and intellectual aims for a smaller student body to a commodity sold within a distinct economic ‘sector’ to a widened population” (Cunningham & Salmon, 2021, p. 2). Therefore, the purpose of Higher Education for students has been explicitly linked to the financial reward of higher remuneration (Jackson & Bridgstock, 2021). The graduate labour market is highly competitive with, for example, 140 applications for every vacancy in the UK (Bradley, 2024), which compounds the challenge for neurodiverse students who are already faced with structural barriers to securing and sustaining employment.

2.2.10. The Value of Neurodiverse Employees in a VUCA Economy

“According to researchers, the top five job skills in 2025 will consist of analytical thinking and innovation, active learning, complex problem-solving, critical thinking and analysis, and creativity” (LeFevre-Levy et al., 2023, p. 5).

Lorenz and Heinitz (2014, p. 1) suggested that autistic people’s “skills of concentration during long-lasting routine work, identification of logical rules and patterns, processing visual information, and the ability to remember facts, surpass neurotypical individuals”. Similarly, Robbins and Ratajczak-Mrozek (2017, p. 4) argue that “adults with ADHD may be better equipped to perform in nonsedentary jobs, like sales, or in highly creative jobs, such as advertising and graphic design, than their non-ADHD peers” and Logan and Martin (2012, p. 57) state that dyslexic people “are able to network with others, explain their business vision and generate enthusiasm for their new venture. They are also often good sales people because they have an interest in others.” In stark contrast to both the deficit-based medical model and socially constructed understandings of autism, the literature suggests that neurodiverse individuals have capabilities that, when fitted to a suitable role, would make them uncommonly valuable to an organisation. Indeed, a key finding by Lorenz and Heinitz (2014, p. 5) is that the integration of autistic individuals “can and should include more occupational areas than natural science, engineering and IT,” which are indicated in the study as being typical expectations both socially and in the prior literature.

2.2.11. Skills Development

In a fourth industrial revolution where automation and advanced technologies such as LLMs have rapidly altered the employment landscape, the requirements that organisations have of their employees are likely to become more specialized and less reliant upon ‘generalists.’ Green *et al.* (2019, p. 1) call for educators preparing graduates for employment in a VUCA economy to “avoid developing generalists deficient in the depth to deliver in specialist fields” and to create “a climate where students and staff are Ambiguity-adverse”. This accords with the findings of Wright (2016, p. 64), who quoted a management consultant working on the recruitment of autistic people for major corporations such as Hewlett-Packard, SAP, and Freddie Mac: “We see them as a highly valuable, underleveraged talent pool predisposed to take on certain tasks”. The common theme is an emerging demand for employees with traits commonly found in neurotypical employees, who are currently underrepresented in those roles. Similarly, Krzeminska *et al.* (2019, p. 455) report that a “talent scarcity problem in certain key areas (e.g., cybersecurity, business analytics) ... overlap appreciably with talents possessed by (some) neurodiverse people” while Adamczewski (2020) highlights those specific areas as

being fundamental to organisational success in a VUCA economy. Austin and Pisano (2017) offer examples of neurodiverse employees driving profound productivity gains simply by being intolerant of chaotic processes or compelling management teams to understand better how to leverage the best performance by all employees based on their understanding of accommodating neurodiverse individuals. Shet (2023, p. 684) found that “in a VUCA environment, complex problem solving and creativity are the analytical competencies essential for success”, while LeFevre-Levy et al. (2020, p. 6) state that “certain groups of neuroatypical individuals actually have some advantages when it comes to innovation, problem-solving, and/or creativity in certain disciplines because of the unique way their brains are wired”.

3. Discussion

3.1. Personal Disclosure

The author of this paper is neurodivergent, having a diagnosis of ADHD, and has close family members who are autistic. Furthermore, the author has experience successfully employing and working with neurodivergent individuals and attributes their professional success to effectively leveraging the attributes related to their neurodiverse condition. Accordingly, while the previous section offers an impartial reading of the scholarship, the following discussion is naturally informed by the author’s experience and perspective.

3.2. Limitations of this Paper

This paper's most significant limitation is the simple unknowability of how technological, sociopolitical and socioeconomic developments disrupting a VUCA environment will shape the future. Furthermore, the nature of disruptive technologies is such that the publication time of journal articles can render specific references to leading-edge technologies redundant; for example, the emergence of DeepSeek in January 2025 completely confounded market expectations for LLMs (Olcott & Wu, 2025) with a consequent single-day market capitalisation loss of \$589bn for the leading AI semiconductor manufacturer Nvidia (Munir et al., 2025). Given the potential scope of literature available in the fields of work technology and neurodiversity, it is also acknowledged that the literature reviewed here, whilst illustrative, is fractional and incomplete. Finally, it must be acknowledged that the highly individualised nature of workplace accommodations and the ongoing technological advancements in this field have necessitated that they be discussed in an allusive and non-prescriptive way.

3.3. The Workplaces of the Future

Every reliable indicator that we have in the scholarship and the industrial press warns that the workplaces of the future will be configured in radically different ways even than today. Significant upheaval is inevitable for employers, employees, governments, and societies that must respond to rapidly evolving change. Nevertheless, while change is inevitable, the shape and nature of that change is unknowable. As we have seen, educated predictions of the future impact of automation are unclear, contradictory, and couched in the equivocal language of uncertainty. Even successful organisations find predicting the future to be a speculative exercise. For instance, Facebook rebranded as Meta in 2021, anticipating that the virtual reality Metaverse would become the “next big thing” (Henry, 2024). However, the rise of generative AI soon overshadowed this vision, rendering it a significantly lesser priority. Similarly, in 2014,

Elon Musk predicted that self-driving cars would be available by 2015, claiming that “90% of your miles could be on auto” (CNN Business, 2014).

Sundaram et al. (2020, p. 23) hold that businesses change “as a response to explicit troubles or opportunities faced by the organisation due to interior or exterior stimulants”. In the Meta example above, change was spurred by a perceived opportunity, the classic characterisation of entrepreneurial innovation. However, this is an outlier. Changes in response to exterior stimulants (for example, evolving customer behaviours, increased competition, or emerging markets) are far more common (Solis et al., 2014), with cost-saving changes to operating models being commonly adopted by competitors and across sectors (Ekekwe, 2012).

Business change, therefore, follows a simple pattern of innovators achieving success with imitators embedding the changed model as a new norm. This has been shown by the changes to workplace relations outlined in the section on the origins of the VUCA economy and the future of work, where employer-employee relations continue to evolve as briefer, more transactional arrangements. While predicting the future of business is, as we have seen, imprudent, it is hard to envisage the return of longer-term employment relations, collaborative career management, generous pensions, and strengthened unionisation as the norm in the current political climate. In preparing for the workplaces of the future, then, the more responsible course of action is to envisage an extension of prevailing trends of outsourcing to freelancers, implementation of LLM technologies, and a strong government focus on reducing the autonomy of educators in favour of skills planning.

3.4. Implications for Organisations and Neurodiverse Individuals

A business model predicated on short-term inputs of specialised skills to meet transient business needs offers an opportunity for organisations to adopt novel approaches to talent acquisition. The prevailing wisdom of recruitment strategies has been to select individuals based on ‘fit,’ a concept heavily influenced by a job candidate’s people skills. However, this is less of a salient issue when recruiting for short-term, often satellite, specialised roles. As such, the traditional in-person interview recruitment process that actively inhibits the employment of neurodiverse individuals is redundant. The opportunity here is for organisations to adopt more inclusive recruitment practices that effectively facilitate considering a broader range of candidates and, by implication, enhance the talent they can recruit. It is well-established that neurodiverse people are extensively underrecruited by organisations using traditional selection methods and that, in specialised roles, neurodiverse people can considerably outperform neurotypical people. The natural consequence of actively undoing this pattern would be improved employment outcomes for neurodiverse individuals and higher performance levels for organisations.

3.5. Psychological and Emotional Impact of Working in a VUCA Economy

It is well-established that neurodiverse individuals benefit from regulated, predictable, and supportive working environments, and a volatile, uncertain, complex, and ambiguous economy is incongruent with those needs. Invalidating professional or social environments will tend to generate maladaptive emotional responses in neurodiverse individuals because of the challenges we experience in emotional regulation. It is fair to say that neurodiverse individuals can be exceptionally productive in suitable roles but may become highly dysregulated during the periods of uncertainty and pressure that securing those roles entails. This systemic issue is

irresolvable by individuals or individual organisations, but it must also be considered by organisations when selecting and onboarding recruits.

Given the importance of self-esteem in re-employment rates for unemployed individuals and how the self-esteem of neurodiverse individuals may be positively impacted by a more favourable assessment of their condition, it follows that success in securing and performing a role will lead to an increased likelihood of securing similar roles in the future. Of course, this is a ‘chicken and egg’ situation for which there is no straightforward solution available to the individual and is dependent on implementing more inclusive practices from employers, lowering the barriers to successful employment and on-the-job performance.

3.6. Adopting an Unconditional Commitment to Accommodation

In ‘Don’t Mourn for Us, (1993, p. 2), Sinclair writes, “The ways we relate are different. Push for the things your expectations tell you are normal, and you’ll find frustration, disappointment, resentment, maybe even rage and hatred. Approach respectfully, without preconceptions, and with openness to learning new things, and you’ll find a world you could never have imagined.” As the workplace evolves beyond recognition in the fourth industrial revolution era, it makes no sense for recruiting organisations to push for things that their expectations tell them are normal. Indeed, there are (at the time of writing) over 85,000 journal articles available on Google Scholar that refer in their title to the post-pandemic era as ‘the new normal’. The ground is shifting under our feet, and this is an opportunity to adapt and respond in a manner of one’s choosing.

Employers generally perceive the types of accommodations that are beneficial for neurodiverse individuals to be expensive and problematic but which, in reality, are low-cost investments that develop into more efficient means of communicating and operating for all employees. Suppose the cost of accommodating a neurodiverse colleague is to produce information in a timely and accessible format or to support workplace flexibility that reduces discomfort and enhances focus. In that case, it is hard to articulate a persuasive counterargument. Indeed, persisting with “the things your expectations tell you are normal” would be inexplicable. Similarly, maintaining recruitment practices that impede that section of the workforce most suited to specific roles would be inexplicable.

3.7. Unconditional Commitment Stems from Awareness and Understanding

Consistently apparent in the literature is that the most successful and supportive workplace accommodation for a neurodiverse employee is to develop a greater awareness and understanding of their condition. From there, the effective creation of an accessible and productive environment readily follows. For organisations and educators, developing a greater understanding of and responsiveness to the neurodiverse community offers an outsized reward.

4. Conclusion

This paper has offered a positive and affirming vision for employers, educators, neurotypical individuals and neurodiverse individuals, highlighting the opportunities resulting from the emerging economic landscape. For employers, there is a clear and straightforward path to making the most of as-yet underleveraged reserves of specifically skilled workers. For educators, the opportunity to offer more appropriate and specific developmental support for students and develop one’s pedagogy is potentially transformative. For neurotypical individuals, the beneficial impact gained from employers’ implementation of accommodative

protocols such as flexible working and clarity of communication is well-established in the literature, and the opportunity to work more effectively alongside a more diverse cohort of colleagues with complementary skills will be both mutually beneficial and rewarding. For neurodiverse young people entering the labour market, this paper's message is that your natural divergence from most people you will work with and for is a precious and rare commodity if directed appropriately and accommodated effectively. The effective accommodation of neurodiverse employees, based on this paper's recommendations, will help organisations find a path to ongoing success in an unpredictable economic landscape and should be adopted immediately as a key strategic objective.

The prevailing discourse around neurodiverse employees is and has been predicated on providing them with sufficient support to minimise the impact of their condition and enable the performance of normalcy. This is a perverse approach in an economy that celebrates difference as a commercial advantage (USPs, Purple Cows, outliers, unicorn start-ups) for businesses seeking optimisation and hyper-productivity, overlooking the commercial advantages of harnessing the talent available to them and failing to develop a diverse and specialised workforce is, at best, foolhardy and often actively harmful.

We have enough neurotypical thinkers already.

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Do Academics' Views on Leadership Align with the Literature, and How Does This Impact Their Teaching of Widening Participation Students?

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Abstract

This article offers an interpretative reading of research interview data gathered with seven academics in a small English university that caters predominantly to widening participation students. The original interviews aimed to explore the most effective ways academics can support students in developing leadership capability. For this article, the author revisited the digital recordings of those original interviews and conducted an interpretive reanalysis of the data. This reanalysis aimed to ascertain the extent to which the conceptions of leadership that the academics hold align with the academic literature on the concept. Leadership is notoriously an ill-defined concept, and so, for this article, the author used Yukl's (2012) taxonomy of leadership behaviours drawn from a systematic review of the literature as the basis for comparative analysis. The literature indicates that developing students' leadership capability is a desirable educational outcome, but this presupposes that academics understand what the term leadership means. This article explores this by evaluating how well the academics' understanding of the concept of leadership aligned with the literature presented in Yukl's (2012) taxonomy and considers the implications of this for their teaching. The article concludes with recommendations for adopting a coherent framework for academics to work within, especially for institutions that serve widening participation students. This article contributes to the knowledge of teaching practice by evaluating how well academics understand a concept they are (implicitly or explicitly) expected to teach and recommends further research to develop the scholarship.

Keywords/key phrases: leadership, widening participation, attribute development, employability, data reinterpretation.

1. Introduction

This study analysed the approaches academic staff adopt to developing leadership capability in the students of a post-1992 English university. Leadership is a notoriously ill-defined topic (Benmira & Agboola, 2021; Jackson & Parry, 2018; Rost, 1993; Bass, 1990) that is subjective and context-dependent (Taran, 2023). Widening participation students tend to experience more challenging educational journeys and systemic barriers to success in higher education, resulting in lower levels of confidence and social capital (Jones, 2021) as well as valuable employability

attributes such as grit and resilience that may make them highly employable individuals (Fellows, 2024). Therefore, facilitating leadership capability is a broader topic than merely developing skills but must also consider those students' particular circumstances and disadvantages (Haque et al., 2021; Thomas, 2020; Howieson & Minty, 2019).

While there is no universally agreed definition of leadership, this study draws on a comprehensive review of the literature that produced a hierarchical taxonomy of leadership behaviours comprised of four meta-categories (*“task-oriented, relations-oriented, change-oriented, external”*) encompassing fifteen specific leadership behaviours (Yukl, 2012, p. 68).

This study analysed how academics working specifically with widening participation students understand the term leadership and explored the approaches they adopted (or chose not to adopt) to support students in developing leadership capability. The study evaluated a series of semi-structured interviews with a range of academic staff members in a small English university that predominantly serves widening participation students. The interviews analysed here originally formed part of a master's degree research project on the teaching of leadership, and this study is a re-evaluation of the recordings from those interviews.

This study explores the following questions:

Research Question 1: Are the definitions of 'leadership' held by academics working with widening participation students congruent with the literature?

Research Question 2: How does their understanding of leadership impact their teaching practice?

2. Literature Review

2.1. The educational context in which these data were gathered

Higher education in the United Kingdom has undergone radical change in recent decades with the introduction of significantly increased numbers of students in a process termed 'widening participation' (Thomas, 2020). Widening participation, in the UK was introduced alongside a change in the way the Higher Education sector is funded, passing the cost burden from the state to individual students creating the 'consumer-student' (Molesworth et al., 2009), and the introduction of specific institutional attainment and progression targets (Cunningham & Samson, 2021) like those impacting tertiary education (Burgess & Thomson, 2023). Many of these changes met considerable academic resistance (Fellows, 2023) and are regarded as symptoms of unwelcome neoliberal interference in student education (Giroux, 2014). However, widening participation is generally considered a positive development (Hodge, 2024; Thomas, 2020; Reddy & Moores, 2008).

2.2. The political leadership context in which these data were gathered

The period during which these interviews were conducted saw the UK experience a 'national emergency' (O'Grady & Fairbairn, 2019) owing to disputes over the nature of its exit from the European Union. During the fourteen-day period over which these research interviews happened, the sitting government lost three significant Parliamentary votes, and two further rounds of indicative voting resulted in none of the presented options securing majority support (UK Parliament, 2019) creating a 'major constitutional crisis' (Rayner et al., 2019). In addition,

a 'People's March' against the government's policy attracted an estimated one million protestors (Marsh & Quinn, 2019) and an online petition reached six million signatories (Mee, 2019).

2.3. Leadership as a desirable graduate attribute

The desirability of leadership as a graduate attribute appears consistently in the literature. A meta-analysis of thirty-nine peer-reviewed articles by Osmani et al. (2015) found eight widely identified graduate attributes, including motivation and leadership. However, Matsuoka and Mihail (2016) found that fewer than 7% of graduate employers felt that graduates possessed leadership skills upon completing their courses. Stuart et al. (2011) found that extracurricular activities that enabled students to develop and evidence their leadership capability gave better access to more desirable graduate job opportunities (see also Surendran et al., 2023), but these opportunities are also more readily available to those students whose social capital already conferred considerable labour market advantages. This distinction makes the development of leadership capability in widening participation students a significant issue.

When adopting the initial position that universities should seek to develop graduates with leadership capability, one must first understand leadership. Jackson and Parry (2018) sum up the problem of finding an adequate definition of leadership by saying that 'leadership is a phenomenon that everyone has an opinion on, but few of us seem to agree on exactly what it is', and Bass (1990; p.87) contends that 'there are almost as many definitions of leadership as there are persons who have attempted to define it'.

2.4. Leadership traits and behaviours

Although 'the study of leadership can be traced back to Aristotle' (Northouse, 2018, p. 9), most scholars agree that Carlyle's Great Man Theory (1841) was the first attempt to define leadership. The premise of Carlyle's theory is that some are destined from birth to be great leaders because of their genetically inherited traits. Stogdill's ground-breaking research of 1948 offered the first challenge to the trait theory (Stogdill, 1948). For Stogdill, leadership is what a person does rather than who they are, and this informed subsequent leadership theories that focused on the behaviour of leaders. Stogdill shifted the focus from the internal (innate characteristics) to the external (things said and done). Theorists began to ask if, since leadership qualities are not innate but rather emerge over time, people could learn to become leaders (Jackson & Parry, 2018; Johnson et al., 1998; Benne, 1948).

In 1967, Fiedler shifted the focus again when he introduced his 'contingency theory of leadership effectiveness', which looked beyond the individual to the situation in which a leader operates to assess their appropriateness and effectiveness. Consequently, just as Stogdill had moved from thinking about internal traits to external behaviours, Fiedler placed those behaviours in a situational context. One commonly cited example of this is the research of Hersey and Blanchard (1969), which found that a significant determinant of success or failure was the leader's performance readiness level or position in the 'life cycle of leadership' (the life cycle theory of leadership was renamed the 'Situational Leadership Model' in 1977).

2.5. Differing models of leadership

In 1978, Burns offered a further perspective on the debate with his Transactional or Transformational Leadership theory. Transactional leadership occurs when followers are rewarded for performing a task, for example, by financial recognition. Transformational leadership, however, occurs when a leader encourages or persuades a follower to maximise his or her potential in a way which also serves the organisation's needs. Other significant, though less pivotal, leadership theories include 'servant leadership' in which the leader serves the follower by empowering them and supporting their development (Greenleaf, 1970; Graham, 1991; van Dierendonck, 2011), the theory of Leader-Member Exchange (also known as LMX Theory) in which the quality of the interpersonal relationship between the leader and follower is a critical determinant in the success of the leader (Graen & Uhl-Bien, 1995; Schriesheim et al., 1999), and System Leadership, in which success is dependent upon the leader's attitude and aptitude to collaboration to meet the challenges of our connected and interdependent world (Senge et al., 2015; Caldwell, 2012).

Conceptualisations of leadership have significantly evolved from the immediate post-war era when behaviours were central to academic thought, but behavioural theories remain prevalent. Indeed, new theories that are related to behaviours as a determinant of leadership success continue to be published: for example, Smith and Lewis's Paradoxical Leadership Theory (2011), which focuses on how leaders respond to the contradictory tensions in organisational life and Rock's (2008) Neuroscience Leadership which explores how five important domains inform leadership behaviours of the brain – status, certainty, autonomy, relatedness, and fairness.

2.6. Yukl's (2012) hierarchical taxonomy of leadership behaviours

For both the labour market and higher education institutions, a graduate's possession of leadership attributes is identified through an assessment of their behaviours (Oliver, 2013). Leadership behaviours, then, are both a measurement and, for educators, a set of development objectives.

In a comprehensive factor analysis review of 'more than half a century of research' on leadership behaviour, Yukl (2012; p.78) identified four meta-categories of leadership. The four meta-categories encompass fifteen specific behaviours that were commonly found in the literature, as represented in Table 1:

TABLE 1. A PRESENTATION OF YUKL'S (2012) HIERARCHICAL TAXONOMY OF LEADERSHIP BEHAVIOURS

Task-oriented	Relations-oriented	Change-oriented	External
Clarifying Planning Monitoring operations Problem-solving	Supporting Developing Recognising Empowering	Advocating change Envisioning change Encouraging innovation Facilitating collective learning	Networking External monitoring Representing

Source: own compilation, based on Yukl, 2012.

For this research, the participants' interview responses were analysed with reference to this taxonomy. There have been more recent systematic reviews of leadership literature (for example, see Mehrad et al., 2020; Deshwal & Ali, 2020; Gumus et al., 2018), but none of these more recent publications offer a taxonomy against which the data under review may be analysed, nor do their findings differ significantly than Yukl's (2012) findings.

3. Method and Methodology

3.1. Methodology

This research involves a reinterpretation of qualitative data (interview recordings) initially gathered as part of a master's degree research project. That project sought to understand how to 'teach' leadership skills and took a positivist approach to analyse the data generated. In this way, the participants were presented in the original analysis of these data as impartial, self-aware actors offering reliable accounts of their practice (Yin, 2016). The original interviewer has subsequently re-examined those data through an interpretive lens for this research. Interpretivism allows for a more subjective reading of the data that considers contextual factors to deliver a richer, though less definitive, account of the data (Silverman, 2015).

The reinterpretation of existing data, either by different researchers (Fielding & Fielding, 2008) or by the same researcher at a different point in time (Åkerström et al., 2004), allows for the reconsideration of nuance and for greater objectivity to emerge. For this study, the data generated during that project is being reappraised by the original researcher who is both a more experienced practitioner and has been liberated from the terms of the original research (Wästerfors, 2013).

3.2. Method

These data were generated as part of a master's degree research thesis. The research design mitigated the constraints inherent in a project of this type, including the time-limited nature of the project and the researcher's developing competence (Cassell, 2015). Qualitative data were generated through eight semi-structured interviews conducted in short succession to generate sufficient depth of the data set without expecting data saturation (Morgan, 2014). Each interview lasted at least an hour, but the varied nature of semi-structured interviewing meant there was no uniformity of length, and the cumulative total of the eight interviews was more than eighteen hours. Interviews were conducted in person with the intention that participant cues, such as pauses, corrections, and changes in body language or tone, might prompt further exploratory questioning, taking advantage of the semi-structured interview process to fully understand the strength of feelings or any anxieties or enthusiasm for a particular point (Cassell, 2015). Each interview included six set questions, with further dialogue and probing questions emerging naturally from the participants' answers (Collis & Hussey, 2021). The six standard questions which each participant was asked were: 1) what, to you, is leadership; 2) should universities be teaching students to be leaders; 3) what are the most effective ways to teach students; 4) what are the barriers to teaching students; 5) how do you know when your teaching has been effective?; and, 6) what is the most important thing that students can take away from their time here. Contemporaneous notes were made solely as a prompt to explore an issue more deeply or return to it later in the interview (Yin, 2016) and do not form a part of the data set.

3.3. Instrumentation and data collection procedures

With the informed consent of the participants, each interview was digitally recorded. Recordings were repeatedly listened to before new transcriptions of the recordings were generated and subjected to coding to generate themes and categories for further analysis (Braun & Clarke, 2017). The slow and laborious process of manual transcription offers a distinct perspective on the language selected and the intonation of the participants by immersing the author entirely within each conversation (Yin, 2016). In re-evaluating the data, the new transcriptions and original recordings were contextualised by the author's understanding of references to events, people, or circumstances that are not explicitly referenced in the recording (for example, references to the change of the Vice-Chancellor as 'the current situation').

3.4. Population and sample

For an insider researcher, many consequential biases are present in recruiting interviewees, such as prejudicial assumptions, pre-existing personal relations, affinity, intra-office politics, and ease of access (Cassell, 2015). The researcher employed a 'snowball' method to identify interview participants to eliminate conscious or unconscious bias. Snowball sampling is a nonprobability method of survey sample selection that requires each participant to select or propose the next participant, whom the researcher will approach directly. While this method has flaws, such as relying on each participant's subjective judgement and network of relationships, it eliminates the researcher from the decision-making process following the initial selection(s) (Johnson, 2014). The snowball method requires the researcher to select only the first participant. In this research, two initial participants were purposively selected from different faculties to develop two referral lines. This approach was selected to ensure time efficiency and manufacture a more diverse group of participants and a broader range of subject specialisms than a single referral line within a faculty would (Johnson, 2014). During the original research, the final recommendation by a participant was for one of the senior leadership team to be interviewed. For the purposes of reinterpreting the data, the researcher removed the interview with the senior leader from the data set. The nominated participant was neither an academic (either current or historic) nor a professional supporting student learning and, therefore, not an appropriate participant for this subsequent project. Inappropriate nominations are one of the disadvantages of snowball sampling identified by Johnson (2014) and thus, the reduction in the data set is methodologically sound.

As a mechanism to ensure consistency of experience for the participants, the interviews happened in the same small meeting room. The choice of a neutral room was a deliberate strategy to avoid any implications of power assertion implied by hosting or visiting colleagues (Perera, 2021), which can be a factor in insider research (Greene, 2014). The neutral interview venue eliminated the potential for the distractions of email notifications, ringing telephones, unexpected visitors, and visible noticeboard items which may have interrupted or informed the participants' answers (Rog, 2012).

3.5. Data Analysis

Repeated listening to the digital recording was conducted for each participant before the transcription process happened. This two-step process was conducted in full for each participant in chronological order. In the listening phase of this iterative process, the intention was to

recognise the relative salience of the points made, with this then being identified in the transcripts by the addition of bold text (heavy emphasis) and italics (suggestive of hesitancy or of usage that was not necessarily literal). The purpose of completing the process in full and sequentially was to ensure that each data set was considered holistically during the analysis process (Silverman, 2015).

The coding process began following the manual transcription of all seven interviews. The reviewer did not revisit the literature on leadership before or during the coding process to avoid the possibility of preconceived categories influencing the analysis (Grix, 2004). Each interview was analysed as a whole and as a distinct entity, including responses to questions that do not, on the surface, relate directly to leadership (for example, the closing set question, "What is the one thing you would like students to remember from their time studying here?"). This process allowed themes to emerge and added crucial contextual information, facilitating an interpretive data analysis (Miles et al., 2018). A code was assigned to every statement across the entire data set, allowing for a thorough and comprehensive reading of the data (Silverman, 2015). By assigning those codes to broader categories, common themes emerged, and by referring those themes back to the original data, the significance of each to the participants collectively and individually was carefully re-examined (Miles et al., 2018). The final stage of the process, the themes emergent from the data was compared to Yukl's (2012) taxonomy to identify the areas of salience and discrepancy which are outlined in the findings section below.

3.6. Limitations

Collis and Hussey (2021; p.100) define limitations as "a weakness or deficiency in the research" and there are several weaknesses in this paper which must be clearly understood by readers.

3.6.1. Age of the data

These data were gathered in 2019 and, as such, are representative of a global and local context which has since evolved. For example, the impact of the Covid pandemic on our understanding of leadership and relevant pedagogies, including subsequent literature on the topic (for example, on Leadership: Shtaltovna, 2024; Turnbull & Murphy; Pierog, 2023; Franzen-Waschke, 2022; and on pedagogical considerations: Bicchi, 2024; Jenei et al., 2024; White, 2024; Fellows, 2023) would not be a factor for the participants and has accordingly been eliminated from the analysis of this data.

3.6.2. Specific circumstances of the data

The highly unusual local, national and global circumstances which form the contextual backdrop to this research have now expired and the findings and analysis of these data should be read through that paradigm, but the impact of these circumstances on the research is intrinsically instructive (Silverman, 2015).

3.6.3. Limited number of participants

This study is based on an analysis of data from just seven participants and, therefore, extreme care should be taken not to extrapolate results beyond what may reasonably be inferred (Yin, 2016).

3.6.4. Participant anonymity

Given the potential sensitivity of the topics discussed in insider research (Cassell, 2015), participants were assured that their names, roles and any other potentially identifying information would not be included in any future publications (Breen, 2018). Regrettably, therefore, participant data which might have been beneficial contextual information for this reinterpretation of the data was eliminated from the analysis and presentation of findings.

4. Findings

The findings from the data analysis are presented with illustrative quotes from the interviews with the participants. The quotes have been fully anonymised and attributed to a participant number indicating their position in the order in which the interviews happened. The selection of each quote is based on its salience and illustrative quality. Unless expressly stated otherwise, these illustrative quotes represent a common theme or concept expressed by all participants. The inclusion or absence of specific participants should not indicate disagreement unless clearly stated. By comparing the findings to Yukl's (2012) taxonomy, the data has been compared to a summative review of the leadership scholarship over a long period of time and, as such, incorporates a representative body of knowledge on the topic.

4.1. Lack of a formal framework or definition of leadership

While all participants agreed that it is both necessary and ideal to support the development of leadership capability in students, there was a lack of unanimity about what leadership is. All participants confirmed that leadership development is not an explicit expectation or routinely mentioned in the documentation created during curriculum development or routine meetings among faculty. All participants confirmed that there is no formal framework or definition of leadership made available to them within the university, exemplified here by Participant 3: *"Higher education is increasingly facing this accountability, metric-driven culture... therefore we look to outcomes that are measurable... those become what are of value. And the problem there is that leadership skills are the kind of skills that are often not measurable or agreed upon."*

The participants demonstrated how they were operating to their own definitions of leadership. Some described seeking informal opportunities to support the development of behaviours that they identify as essential in a leader as with this comment from Participant 4: *"We do a lot of stuff on leadership already, but we don't call it that. So sometimes, because it's not called something, people think it isn't really happening."* Some participants, however, were more reticent to attempt to facilitate the development of leadership behaviours as they doubted the capability of their students to respond effectively with Participant 1 commenting: *"If we're trying to embed leadership qualities in them... I think you have to be very mindful of what knowledge base and emotional base are they coming from."* Participant 6 warned that academics simply may not see leadership development as a part of their role: *"I'm aware that there are parts of the university where the staff just want nothing to do with this. And then they will lean back on 'there isn't enough time, I have to get through all this material'. And it's a very difficult thing to teach formally."*

4.2. Task-oriented

Turning to the comparison between these data and the taxonomy proposed by Yukl (2012), the first significant finding is that task-oriented behaviours are dismissed by the participants as not being associated with leadership at all. Instead, the participants almost uniformly saw those behaviours as *management*, which they consider a distinct and lesser concept. Each participant made the point at least once that, although leadership takes different forms, it is definitively not the planning and monitoring of operations that Yukl (2012) identified, for example, contrast these statements from Participant 6: *"Management skills are the things to do with organisation and delegation, and who is doing what task, and when, which is not the same as leadership."* and Participant 5: *"Managing is, I suppose, more the coordination of resources, and finances, and rooms"* with Participant 4: *"Leadership is ... more about values and relationships than anything else."*

4.3. Relations-oriented

In stark contrast to the absence of task-oriented behaviours from Yukl's (2012) taxonomy, all participants mentioned relations-oriented behaviours, and those mentions were frequent and with significant emphasis, except for the fourth behaviour, *empowering*. Only Participant 4 mentioned the expectation of a leader to be able to empower their followers: *"Good leadership is being able to genuinely distribute the leadership... distributing the leadership says 'you're leading this, so lead it. It's empowerment."* The remaining participants' conception of leadership was more directive, based on follower subordination and related to a concrete means of achieving a desired outcome. According to Participant 5, Relations-oriented leadership amounted to *"...being able to take people with you. Saying 'this is the way, and you need to buy into it', kind of thing."*, while Participant 3 emphasised the inequitable dynamics of the relationship: *"Their first steps to leadership are to learn to be led in a more power-structured way."* and Participant 2 characterised leader-follower relations as being nonreciprocal: *"A leader needs the ability to sit people down and talk them through things and tell them the what and the why and the how, without there being any tension."*

4.4. Change-oriented

In discussing leadership as a concept and set of behaviours, the participants spoke repeatedly about two change-oriented behaviours identified by Yukl (2012). *Envisioning change* and *advocating change* were heavily emphasised themes, exemplified here by Participant 7: *"To have a vision about what you want to do and then to be able to bring people along with you."* and Participant 2: *"Leadership is about identifying a direction and then getting people to come along with you because you've chosen the right thing to do."*. The two other themes categorised by Yukl (2012) as Change-oriented, *encouraging innovation* and *facilitating collective learning* are also present in the data, though less frequently or emphatically.

4.5. External

Yukl's (2012) taxonomy identifies three outward-facing leadership behaviours as consistently present in the literature: *networking*, *external monitoring*, and *representing*. None of these three behaviours appear in any of the participants' conceptions of leadership other than, tangentially,

a discursive mention of the current political turmoil *"torpedoing our reputation on the world stage"* from Participant 4.

4.6. Widening Participation students

When asked directly, each participant concurred that the facilitation of developing leadership behaviours *should* happen. At the same time, each expressed the opinion (either directly or by implication) that this was unlikely to be successful with some or all students. Participant 1 offered the opinion that: *"To get students to think about leading is quite tricky... they just look like 16-year-olds at sixth-form college. You could ask different departments to nominate students they've seen good leadership skills in."*, while Participant 7 was rather blunter in their assessment: *"Are they going to go on to be leaders? In the majority of cases, probably not."*

These observations were emblematic of broader concerns about the metrics-driven culture of compulsory schooling and the impact of marketized higher education on recruiting students whom several participants perceived to be unprepared and ill-equipped for undergraduate-level study. Participant 2 offered a pessimistic view of the student cohort: *"They arrive having learned to repeat information to pass exams, and we then say to them, 'You're not as good as you think you are'. It's incredibly disempowering. But, at the same time, some of them won't move beyond that, and we have to understand that. Not everyone who gets here belongs here."* while Participant 1 offered a kinder perspective, but one which more directly attached the responsibility to individual students: *"some of them come in, you know, bless them, with their cap on backwards, looking at their phone, eating a panini. They aren't coming in ready to learn"*. This negative judgement of the students was echoed by Participant 5: *"There are some students it is nigh-on impossible to engage with"* and Participant 7: *"these students are weak, not necessarily intellectually, but they're in the wrong place"*. Participant 3, however, offered a more introspective view: *I'm sitting here quietly grumbling about schools feeding us students who aren't prepared for higher education because they've been too mollycoddled, too overprotected and protected [sic] from failure. We're all complaining about that, and then we're fulfilling that same legacy and presenting them out to employers ill-prepared for failure"*. Stuart et al (2011) proposed that leadership is developed most effectively in extracurricular activities, however the participants made no reference to the students' capacity or tendency to engage in such activities.

4.7. Widening Participation institutions

The nature of working in an institution that caters predominantly to Widening Participation students suffused the data generated, whether by comparison with the students of a neighbouring redbrick university, Participant 1: *"they're all walking around with their university branded tracksuits and they always have their textbooks"*, in the context of the students' personal circumstances, Participant 6: *"The nature of our students is that they tend to have really busy, complicated lives"*, or fatalistic accounts of the students' future prospects, Participant 7: *"these students are going into careers where they're never going to be the highest earners"*. While the participants are actively aware of the additional challenges that supporting Widening Participation students entails, only rarely did they reflect on how those frustrations impacted on teaching practice and even then the critique was abstracted to their colleagues as with Participant 7: *"One student told me that his group was told in the first year 'we know fifty per cent of you won't pass'. I mean we'll take your nine grand but then turn round and say that"*

to them. Imagine!" and Participant 6: "When you're adding on these nice-to-haves, they're always the first things to go. People simply say, 'I've got enough to get through already'".

4.8. The participants' own institution

In addition to the nature of the institution, the specific circumstances that the participants had experienced in their institution was a common topic, exemplified by Participant 3 here; "*You have one faculty with what might be termed 'over-authoritarian leadership' and another where the leader has been asleep at the wheel. Neither is good. Neither should have been allowed to go on for this long.*"

5. Discussion

This study explored the following research questions:

RQ1: Are the definitions of 'leadership' held by academics working with widening participation students congruent with the literature?

RQ2: How does their understanding of leadership impact their teaching practice?

This research was conducted in a small English university where widening participation students form a significant majority. At the time of these interviews, the university prospectus (no longer available online or in print) stated, "Our graduates will go on to be leaders in their careers and their communities", indicating that there is an appreciation within the institution of the necessity of supporting students to develop the attributes and behaviours of leadership. It is also apparent from these data that there is a broad consensus among the participants that developing leadership capability in their students is desirable. The participants articulated that leadership is a nebulous and contested concept, though they had not necessarily realised this beforehand. Consequently, there is a dissonance in these data: How can leadership be universally desirable and yet, at the same time, ill-understood and the subject of disagreement? The working definitions that the participants offered were broadly consistent with one another, but when placed in context with the literature, they are limited and, tellingly, appear overwhelmingly reflective of the participants' current professional and societal experiences. None of the participants referred to or indicated familiarity with any of the academic literature on leadership.

Revisiting these data at some distance clarifies how contemporaneous local, national, and global events influenced the participants' perspectives. All the participants described leadership as the product of just two of Yukl's (2012) four meta-categories: *relations-oriented* and *change-oriented*. These data were gathered in an institution that was and had been, for some time, in stasis due to the transition of the Vice-Chancellor. The professional situation the participants were experiencing at the time of the interviews clearly informs the interpretation of leadership that they offer. The participants in these interviews were largely disdainful of the *task-oriented* behaviours that Yukl (2012) identified. Task-oriented, managerial behaviours were the elements of leadership that the participants had continued to experience in their daily responsibilities. At the same time, the participants reified the relational and visionary behaviours that they keenly felt the current absence of. The participants similarly disregarded *external* leadership behaviours that Yukl (2012) identified but would not have significantly impacted their professional experience in any meaningful way. Analysing these data through

an interpretive lens shows that the participants' characterisation of leadership was limited to the leadership behaviours that they felt were missing in their professional lives and that seemed to be absent in the national government.

The approach to teaching taken by the participants, including supporting the development of leadership capability, may also have influenced the participants' characterisations of what leadership is. While the participants were keenly aware of the barriers facing their students, it would be an overstatement to ascribe to the participants a deficit view of their students. Indeed, warmth and care suffused even their negative depictions. What is undeniable, however, is that the participants were consistently apprehensive about the capability or readiness of some of their students to engage with the concept of leadership or successfully develop relevant behaviours. Aside from one mention, any indication that the participants were preparing the students to empower others was absent from these data. Instead, the participants saw leadership as a process of cajoling and shepherding followers, perhaps reflecting how they saw themselves leading their students.

There is a resignation and frustration apparent throughout these data that is occasionally made bluntly explicit. In this context, it is reasonable to question the extent to which the desirable but challenging and un-mandated development of leadership capability is maintained. Each of the participants said that they believed the development of leadership is desirable; five of them explicitly stated that they try to achieve this, but, as Participant 6 identified, when the process isn't mandated, it becomes a negotiable and, therefore, vulnerable additional extra.

The findings from these data suggest that the lack of an agreed framework or definition of leadership for the participants to work toward creates a vacuum. If a university aspires to develop the leadership capability of its students, whether this is motivated by its values or simply to improve its position in national league tables, this research indicates that introducing a guiding framework or definition is imperative. There is no cohesiveness in the approach to developing leadership capability among the participants. Indeed, there is an underlying sense that attempts may be rationed or abandoned based on a student or cohort's perceived responsiveness and projected capabilities. One of the participants even proposed implementing a two-tiered system distinguishing between those '*born to lead*' and those who may be '*taught to lead*'.

This research aimed to identify the extent to which the conception of leadership that the study participants have is in alignment with the literature. Yukl's (2012) taxonomy of leadership identified four meta-categories and fifteen specific behaviours. In these data, the participants presented an understanding of leadership that narrowly focuses upon two meta-categories and almost entirely elides the other two. This relatively narrow conception of leadership lacks any element of task orientation or external presentation. In the absence of any defined framework for developing leadership capability, defaulting to this condensed model for leadership would likely limit graduates' understanding of and efficacy in performing the elided tasks. The implication for these graduates' ongoing employability and leadership potential is that they would be less well-equipped than contemporaries who had experienced a more well-rounded education.

The professional and sociopolitical context in which the participants were interviewed has been discussed above. The other contextual consideration that impacted the discussions was the nature of teaching in an institution that caters predominantly to widening participation students. From unfavourable comparisons to the students of a nearby redbrick institution to external

factors commonly impacting their likelihood of success to disempowering readings of performance data and blunt assessments of the inequities of the labour market. There is a common theme in the data that attempts to develop leadership capability in students will not result in many of those students going on to become leaders. One can only speculate how this might impact teaching practice.

6. Conclusion

The findings of this research suggest that the participants' understanding of leadership is partial when compared with the academic literature, according to Yukl's (2012) systematic review. Following an interpretative qualitative analysis, critical contextual factors were identified that may partially or fully explain the specific leadership behaviours upon which the participants focused. This analysis identifies important considerations and challenges related to and following on from the central and predictable outcome that academics cannot expect to teach something they do not fully understand.

6.1. To develop leadership capacity in their students, institutions should implement a guiding framework

The findings from this research indicate that, without a guiding definition or framework, academics will generate their own definitions of leadership, informed by mutable external influences and not necessarily in alignment with the literature. Implementing a framework for teaching might offer high-level principles towards which academics can work when designing their programmes. For example, using the Yukl (2012) taxonomy, a framework might require that each of the four meta-categories of behaviours be present in a student's learning objectives at least once each academic year. This requirement would provide a degree of rigour by aligning the activity to the literature while allowing staff to embed this activity within their teaching creatively. Without a framework, these data indicate that the possibility of misunderstanding, de-prioritisation or inequities of opportunity significantly increases.

6.2. A framework is particularly necessary when working with widening participation students

The topic of inequities also speaks to a broader question of how to effectively support students from disadvantaged backgrounds. Each participant in this research spoke passionately and with an admirable commitment to students' success but with an underlying subtext that their hard work might be futile for various non-pedagogic reasons. This subtext sometimes sounded like resentment or resignation, implying that this may manifest itself in their teaching practice. The nature of widening participation students is that there are challenges in providing the forms of education that will allow them to prosper in the same way as more materially advantaged students. Facilitating the development of such students as leaders, even when some perceive that those students may never actually become leaders, should be no less of a priority than it is for more privileged students. The implementation of a guiding framework would help to realise this aspiration.

6.3. Recommendations for further research

Though rich in content, these data were gathered from a limited number of participants working in a small institution during an atypical period of professional and social turbulence. Therefore,

the findings and conclusions drawn from these data should not be considered for direct extrapolation but may nevertheless be instructive and worthy of further consideration. Therefore, it is recommended that further research is undertaken in a range of higher education settings to ascertain just how well academics' understanding of leadership aligns with the literature and what consequential impact any discrepancies or incongruities may have on the experience of their students.

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Understanding the Early Impacts of School Mentors’ *Ethics of Care* on Filipino Gen Z Novice Science Educators’ Informal Professional Learning

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Abstract

Care-centric mentorship plays a pivotal role in helping novice educators successfully adapt to the realities of academic institutions. As members of Generation Z begin to enter the teaching profession, they encounter a noticeable lack of formal mentorship and learning platforms tailored to their unique generational characteristics. Consequently, they turn to informal school mentors for guidance and support during this critical phase of their early careers. This study employed a Husserlian phenomenology to uncover the essence of the early impacts of the Ethics of Care provided by school mentors on the informal professional learning of Filipino Generation Z novice science teachers. Ten participants were purposefully selected from a strategic region in the Philippines, employing semi-structured interviews as the data collection method. The field texts were analysed using Colaizzi’s procedural steps to distil the phenomenon’s essence. The findings were validated through the member checking procedure and the critical friend technique. Based on the thematically analysed participants’ interviews, the study introduces the *Typology of Ethics of Care-driven Informal Professional Learning*, which comprises three distinct learner personas: the *Mindful Member*, the *Grounded Inquirer*, and the *Utility Thinker*. Shaped by caring encounters with informal mentors, each persona encapsulates focal points, fostering antecedents and formative impacts, reflecting their dynamic takeaways. These insights can inform contemporary educational organisations and school mentors in implementing evidence-based mentorship strategies and professional development interventions, ensuring contextual support that empowers this cohort to navigate institutional roles effectively and contribute meaningfully to their educational communities.

Keywords: Ethics of Care, mentorship, informal professional learning, Gen Z, phenomenology

1. Introduction

The emergence of Generation Z, born between 1997 and 2012 (Dimock, 2019), as professional workers is increasingly felt across industries (Hendriana et al., 2023). Shaped by the advent of social media, this cohort exude neoliberal perspectives, unconventional work ethics, and distinctive institutional commitments (Gaidhani et al., 2019). In the academic milieu, talent capital shifts ignited by the impending retirement of the school administrators from the earlier generations, coupled with the projective studies that the millennials will begin to occupy the upper echelons of the hierarchy by 2025 (Omilion-Hudges & Sugg, 2019), brought changes on the dynamics of contemporary academic institutions. Consequently, educational scholars far and wide are now focusing on the legacy of outgoing school leaders and preparing millennial academic managers for future influencing roles (Obmerga, 2024), alongside exploring the psyche, attitudes, and behaviours of the youngest entrants into the education sector.

The professional inclinations of Generation Z (hereafter referred to as “Gen Z”) call for flexible environments attuned to their authentic work needs. In education, longstanding onboarding programs often subscribe to a normative-functionalist approach, strategically inducting new teachers and leaders through transition programs and didactics to accelerate adaptation to school systems (Lumby, 2014). However, since the generation under the spotlight has been portrayed as unpredictable, reactive, and defiant (Lazăr, 2023), it is still uncharted if they will embrace the rigid pathways for professional learning that will be curated on their behalf.

1.1. Professional Learning and Gen Z

Compounding the concerns about Gen Z’s adaptation to formal learning is the lacklustre professional development platforms among contemporary academic institutions, which only centre on brief job orientations, performative dialogues, and sporadic training borne out of clamour (Shanks et al., 2022). Professional learning, often used interchangeably with professional development, not only encompasses skill acquisition among teachers but also deepens their engagement with organisational citizenship (Bobis & Tripet, 2023). Its primary type, formal professional learning, focuses on regimented efforts to enhance competencies and prepare employees for expected roles (Barton & Dexter, 2020). While this learning mode may seem the logical method for helping novices acclimate to organisational life, recent research suggests that it may not ensure sustained acclimatization throughout various career stages (Burt & Jones, 2023).

Gen Z engages in freewheeling activities that resonate with their worldviews and sensibilities, helping them understand the nuances behind their work engagements (Martín-García & Dies-Álvarez, 2024). This deeply-seated inclination drives them toward non-formal and informal learning options to maintain professional growth and anchorage with organisational goals. Beyond the non-formal learning route through seminars, workshops, and training conducted outside of working hours, informal learning enables continuous and organic learning experiences, supporting professional growth as an inherent part of daily work interactions and routines (Kyndt et al., 2016). Due to its incidental occurrence, informal learning gradually contributes to the formation of professional *ethos* (belief) and *personae* (identity) among new teachers, which could shape long-term practices (Hager, 2012).

1.2. Informal Professional Learning, Mentorship, and Science Teachers

In stark contrast with their counterparts in humanities, science educators devote significant time and effort preparing for laboratory sessions, sensemaking technical lessons, and outsourcing teaching equipment. These steep learning curves are further complicated by the necessity of adapting to new school environments. School administrators often operate under the misguided assumption that university education alone adequately prepares novice teachers for the multifaceted demands of academic institutions (Mokoena & van Tonder, 2024). Considering the glaring instability in providing structured professional learning opportunities across schools, it is imperative to capitalize on available resources to ascertain novice educators' competence. As informal professional learning remains a consistently available avenue, academic institutions should position it as a critical pillar within the broader paradigm of professional growth, recognizing its pivotal role in imbuing well-rounded teacher development (Dogan et al., 2016).

Given that previous generations of science educators have profoundly influenced the standards for thriving in science education, even without organisational support, there is a dire need to assess whether Gen Z will demonstrate similar adaptability (Honeybun-Arnolda & Obermeister, 2019). During the initial phases of educators' careers, the lack of a consistent support system, including peer learning and mentorship, amplifies work-related stress and turnover intentions, emphasizing the urgent need for effective mentorship networks (Blonder & Vescio, 2022). With sufficient mentorship, these educators can establish a solid foundation for professional learning, enhancing their capacity to navigate complex instructional and organisational responsibilities successfully.

1.3. Mentorship and Ethics of Care

Whether inward-tending or outside-looking, professionals who engage in informal learning within the workplace often seek out a more knowledgeable other who can mentor them (Demirbilek & Keser, 2022). Given the critical nature of educators' novice years, typically the first three years (Curry et al., 2016), exposure to a caring mentor not only helps prevent '*praxis shock*' (Kelchtermans & Ballet, 2002, p. 105) but also instils enduring personal and professional values that support their advancement and success in the workplace. However, Gen Z's stereotypical notoriety for individualism and resistance to forging interpersonal connections may hinder their relationships with mentors, potentially derailing any promising partnerships.

By and large, to mitigate friction in interactions, scholars have pointed to Gilligan's (1987) *Ethics of Care* as a humanistic approach that could be applied implicitly or explicitly within organisations. In the context of mentorship, Ethics of Care emphasizes empathy and support, prioritizing relational factors over adherence to policies (Kim, 2023). This altruistic act is the antithesis of Ethics of Justice, which focuses on fair proceedings and compliance rates (French & Weis, 2000).

Mentors who embrace Ethics of Care cultivate meaningful interactions with colleagues, showing concern during challenging times and providing individualized support to assist them in hitting the ground running in the workplace (Oberhauser & Caretta, 2019). Considering the inconsistencies in the delivery of professional learning platforms within modern educational institutions, a supportive, care-driven environment may compensate for these shortcomings and

help new Gen Z teachers maximize their potential and derive meaning from their early organisational experiences.

1.4. Overarching Blank Spot and Central Question

Despite its relevance, the Ethics of Care remains underexplored in institutional and school mentorship study domains (Tomkins & Bristow, 2023), particularly in developing countries in the Southeast Asian region, such as the Philippines. Positioning it at the forefront of organisational scholarship signals a fertile ground for insights into understanding the layer of participants' experiences. Hence, this unresolved gap in the extant literature warrants a preliminary qualitative exploration into the influence of care-driven informal mentorship on the professional learning of a unique demographic within 21st century schools. Taking the emic perspectives into account, the Filipino mentors and mentees' communitarian values, such as *Pakikisama* (Social harmony), *Pagkalinga* (Nurturance), and *Malasakit* (Compassion) (Landa-Jocano, 2006), may further dictate a peculiarity with the Gen Z educators' informal learning experiences.

Cognizant of the foregoing premises, this phenomenological inquiry sought to answer the central question: *How do a select group of Filipino Gen Z novice science teachers collectively interpret the early impacts of their care-driven school mentor on their informal professional learning?* This organisational phenomenon, incarnated in their lived experiences, is a text that needs to be read.

2. Methods

2.1. Research Design

The nature of the blank spot noted in the literature, the understanding of the essence of the early impacts of the Ethics of Care extended by informal mentors to the professional learning among the Filipino Gen Z novice science educators, was effectively surfaced by utilizing a Husserlian phenomenological design. As a potent qualitative paradigm, the descriptive type of phenomenology centres on the “*direct exploration, analysis, and description of a particular phenomenon, as free as possible from unexamined presuppositions while aiming at maximum intuitive presentation*” (Spiegelberg, 1975, p. 57).

As the inquiry purported to surface the collective meaning behind the lived experience on the critical role that mentors' Ethics of Care assume in such a significant career phase of a progressive generation, utilizing the Husserlian phenomenology accorded the study with an impartial depiction of the participants' eidetic insights without the inherent biases of the researchers.

2.2. Research Participants and Locale

The depth and breadth of the layer of experience were gleaned from ten (10) participants. Eight (8) participants were initially recruited in the individual interview sessions. Upon reaching the saturation point of their responses, the researchers tapped two (2) additional participants to verify if such a condition had been attained. The participants were recruited using the purposive sampling technique with the following inclusion criterion: (a) natural-born Filipino citizen, (b) belongs to Gen Z (1997–2012), (c) a graduate of Bachelor of Secondary Education major in Science or a higher academic degree, (d) actively practising the teaching profession and

currently handle science-related subject(s) in their respective educational organisations, (e) whether a newly licensed professional teacher or about to take the board examination for educators, (f) not a recipient of formal professional development programs and not a member of any professional learning community in the school, and (g) willing to participate in the inquiry. The participants hail from Region IVA: CALABARZON, a rich melting pot of educational, cultural, political, and economic zones in the Philippines.

Table 1 summarizes the demographic profile of the participants.

TABLE 1. THE PARTICIPANTS' PROFILE (N=10)

Code	Age	Sex	Degree	Teacher Licensure Standing	Nature of School Affiliation	Teaching Experience	Grade Level Assignment	Science Subject(s) Handled
P1	24	F	M. Sc.	Passer	Private	2 y	JHS; SHS	IS
P2	24	F	BSEd	Passer	Public	1 y 3 m	JHS; SHS	IS; ELS
P3	22	F	BSEd	Taker	Public	1 y	JHS	GP; ELS; A
P4	24	F	BSEd	Passer	Public	1 y 6 m	SHS	ELS
P5	22	M	BSEd	Taker	Public	1 y	JHS; SHS	IS
P6	23	F	BSEd	Passer	Public	1 y 3 m	JHS; SHS	IS; ELS
P7	23	M	BSEd	Passer	Private	1 y 7 m	E; JHS; SHS	IS; GB; GP
P8	23	M	BSEd	Taker	Public	8 m	JHS	IS
P9	23	F	BSEd	Passer	Public	1 y 3 m	SHS	ELS
P10	23	F	BSEd	Taker	Private	1 y 4 m	JHS	IS

Legend: M. Sc.: Master of Science in Science Education; BSEd: Bachelor of Secondary Education major in Science; E: Elementary; JHS: Junior High School; SHS: Senior High School; IS: Integrated Science; ELS: Earth and Life Science; GP: General Physics; GB: General Biology; A: Astronomy

Source: Constructed by the Lead Author (2024)

2.3. Instrumentation

The inquiry employed a two-pronged instrument. The first part chronicled the participants' profiles using a *robofoto* (Kelchtermans & Ballet, 2002). This Dutch term means a cartographic sketch of the participants. The *robofoto*, made up of checkboxes and blank spaces, was filled in with the requisite demographic information. Moreover, the second part was devoted to the aide memoire formulated from *A priori* constructs about Ethics of Care, professional learning, and Gen Z attributes found in the literature. The aide memoire was primarily comprised of open-ended semi-structured interviews and probing questions. Some of the key questions included in the interview guide are as follows: “*How did your interactions with the mentor help you solve a challenging task?*”, “*What are the practices that you have observed from your mentor that made you feel more connected and supported as a novice science teacher?*”, “*Can you share an experience wherein a colleague’s support assisted you in navigating a difficult situation in the school?*”, “*How do you perceive your generation’s values—like transparency and adaptability—impacting your professional learning and development as a science teacher?*”, and “*In what ways did your mentor’s empathic treatment shape your teaching practices and student engagement?*”

2.4. Data Gathering Procedure

After identifying study participants who met the inclusion criteria, the researchers initiated a series of formal correspondences regarding their participation. The overarching aims and specific research objectives were explained in detail during this initial interaction. Once participants expressed their intent to join the qualitative investigation, the researchers provided them with a Quick Response (QR) code that directed them to the scheduled interview. A semi-structured interview format was employed, chosen for its ability to balance structured conversation with open-ended dialogue, thereby facilitating comprehensive and in-depth responses. Most participants underwent 2-3 rounds of semi-structured interviews; except for Participant 1, who received a single extended session due to a scheduling concern. Each interview, conducted by the lead author, was transcribed for subsequent data analysis. To ensure clarity and further engagement, debriefing sessions were also offered to participants at the last interview session, allowing them to clarify ambiguities, reflect on their experiences, and ask questions about the phenomenon. The interview sessions were conducted between August 15, 2024 and October 25, 2024.

2.5. Mode of Analysis

Colaizzi's Procedural Steps (1978) surfaced the thematic areas through extraction, organisation, and dynamic analysis. Aside from being heavily used in various educational and organisational studies, this elicitation method was selected due to its pragmatic and sequential features to arrive at the thematic representation of the participants' collective experiences. The iterative process entailed (re)reading the transcriptions, synthesizing the formed essences in clusters or themes, assigning descriptions, and validating the emerged eidetic insights to the participants.

2.6. Data Trustworthiness and Rigour

The researchers adhered to the expected trustworthiness and rigour of qualitative research by actively engaging in reflexive practices and meticulous methodological steps. *Confirmability* was established through bracketing, implemented via systematic reflexive journal writing to document and critically assess their potential biases throughout the study. To strengthen the inquiry's *Credibility*, the researchers engaged in sustained correspondence and prolonged dialogue with the participants, incorporating member checking to validate whether the emerging findings aligned with the participants' realities. These strategies not only demonstrated that the saturation point of responses was reached before concluding the interviews but also reflected a commitment to authentically representing the participants' lived experiences.

Additionally, the facets of *Transferability* and *Dependability* were conducted by presenting rich and thick descriptions of the phenomenon, enabling readers to identify parallel encounters with their own contexts, and by providing detailed accounts of the data collection process to support future scholarly replication in other fields and cultural settings. Finally, to adhere to the highest standards of presenting a qualitative inquiry, the researchers followed the Consolidated Criteria for Reporting Qualitative Research (COREQ) (Tong et al., 2007).

2.7. Ethical Considerations

The inquiry was cleared by the Ethics Review Committee of Centro Escolar University Manila under Protocol Code: CPH301-12425. All participants received verbal and written briefings highlighting the inquiry's overarching aims, specific research objectives, phases and procedures, minimal to absent risks, numerous benefits of participation, information storage and deletion, and strict data privacy and confidentiality adherence. Additionally, they were guaranteed that they could withdraw their participation at any point in the inquiry. Informed consent forms were secured before scheduling individual interviews with the participants.

3. Results and Discussion

Interestingly, this phenomenological study's rich and thick individual and collective accounts yielded the *Typology of Ethics of Care-driven Informal Professional Learning* among Filipino Gen Z novice science educators (Table 2) that accentuates the essence of the role that Ethics of Care, as exhibited by their school mentors, assume in their informal professional learning as beginning science teachers. This insightful typology presents the trifocal *Forming Professional Learner Personas* on being and becoming a *Mindful Member*, *Grounded Inquirer*, and *Utility Thinker*, respectively, as brought about by the ensuing caring-driven episodes accorded by their school mentors.

These thematic personas are being instilled in them through navigating the three-pronged directional areas, representing the people, process, and product (*Focal Points*) that they should consider seizing actionable opportunities for holistic professional development (*Fostering Antecedents*), thereby maximizing its long-term effects on their budding years as educators (*Formative Impacts*). A series of complementary mind maps (Figure 1) bearing the thought elements of the sub-components of the typology has also been presented.

3.1. On *Mindful Member* as a Forming Professional Learner Persona

The participants acknowledged that they would only be novice science teachers once; hence, they aspired for this pivotal period in their early careers to be characterized by substantial and meaningful learning experiences. From their perspectives, as long as informal mentors offer transformative advice on valuing harmonious relationships within the institution, they could continue learning various aspects that would aid them in their future endeavours. This view traces its nexus to the work of Walters and collaborators (2020), who found that mentees develop relational competencies through contact with a caring mentor. Similarly, Varney (2009) observed that humanistic mentors typically demonstrate care by fostering both the intrapersonal and interpersonal growth of their protégés. Participants 4 and 9 shared:

"A caring environment can help mentor and mentee feel comfortable and reduce the pressure that new teachers often experience, making their transition [to the school] smoother and more enjoyable." (P4)

"Genuine and caring science mentors should challenge mentees for growth without making them feel burdened, focusing on professional improvement." (P9)

Despite lacking access to structured platforms for professional development, they did not view this as a hindrance to their career growth. Instead, they believed the invaluable insights gained

from their cordial relationships with mentors and colleagues could compensate for this shortcoming, enabling them to continue learning about their roles despite fragmented experiences. As members of a collectivistic society, where ‘*Pakikisalamuha*’ (Socialization) emphasizes close relationships in both families and workplaces (Landa-Jocano, 2006), they resonate with Bellocchi’s (2019) challenge to the stereotype of emotionally-detached science educators, who assert that rapport-building is also essential in professional undertakings. As imparted by Participants 5 and 8:

“These days, I surround myself with seasoned teachers who are already stable in their professional careers; it greatly impacted my personality and career life.” (P5)

“Caring mentors do not see new teachers as competition but as a family and companion.” (P8)

TABLE 2. THE TYPOLOGY OF ETHICS OF CARE-DRIVEN INFORMAL PROFESSIONAL LEARNING AMONG FILIPINO GENERATION Z NOVICE SCIENCE EDUCATORS

	Essential Question:	Theme No. 01	Theme No. 02	Theme No. 03
Forming Professional Learner Persona	<i>What professional learner characteristics are being holistically developed in novice teachers upon receiving the Ethics of Care from their mentors?</i>	Mindful Member	Grounded Inquirer	Utility Thinker
Focal Point	<i>What should their focus be if they want to cultivate their professional learning further?</i>	Symbiotic (People)	Diagnostic (Process)	Pragmatic (Product)
Fostering Antecedents	<i>How can they demonstrate their ongoing professional learning within the school?</i>	▪ Collaborating ▪ Perspective-taking and making	▪ Forward Thinking ▪ Periodic Auditing	▪ Benchmarking ▪ Reciprocal Feedbacking
Formative Impacts	<i>What will linger with them after the care-centric and informal professional learning experience?</i>	Sense of Synergy and Diversity	Sense of Reflexivity and Proficiency	Sense of Quality and Sustainability

Source: Constructed by the Lead Author (2024)

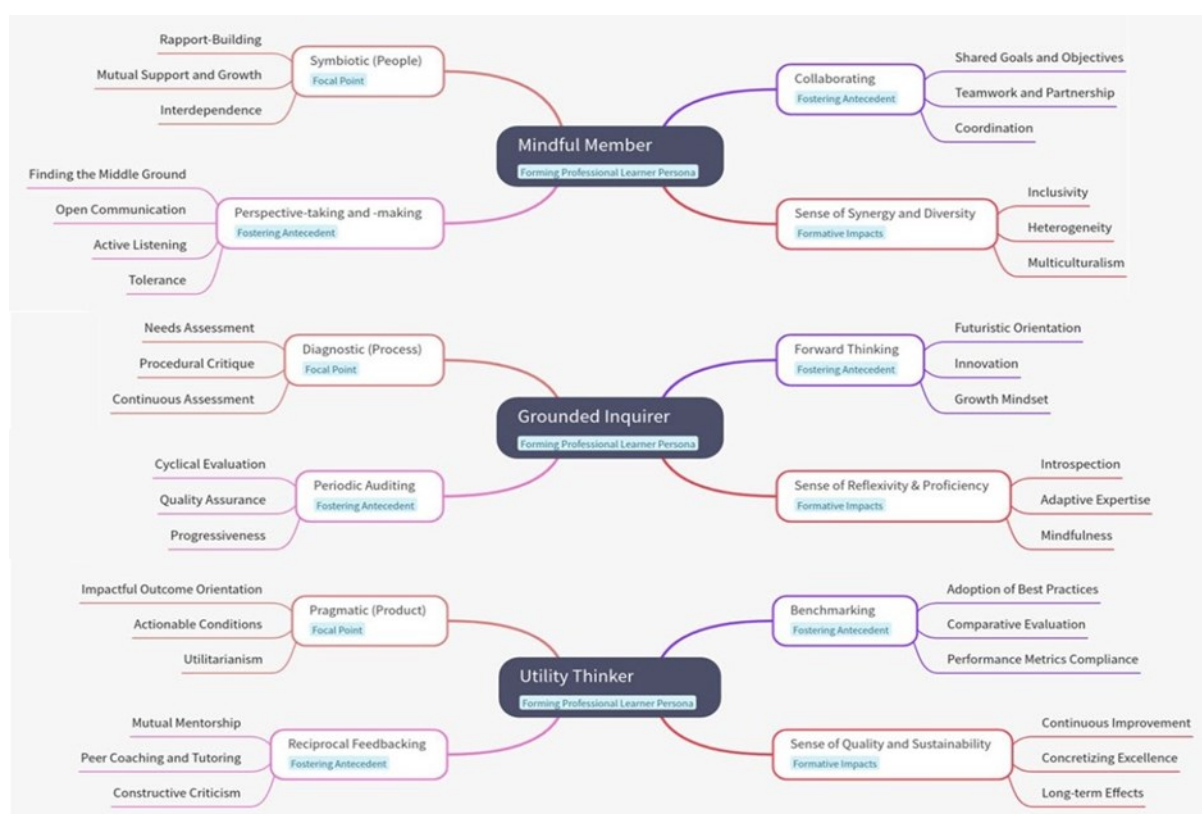
3.1.1. People as a Focal Point (Symbiosis)

Albeit occasionally envious of novice educators from other institutions with more structured professional learning, the participants acknowledged that learning from various people in their organisation gave them the unique opportunity to observe and understand often overlooked perspectives in real time. This contention opposes Miller and Mills’ (2019) claim that Gen Z is close-minded and stubborn in relationships. Likewise, Vesterinen and associates (2016) noted that science educators, motivated by citizenship science, intend to take actions that could benefit others. Participants 5 and 6 expressed:

“In this new generation, new science teachers can serve as an aid to those teachers who have been teaching for several years as we are packed with skills and pedagogies that are based on 21st-century education.” (P5)

“[Engaging with fellow faculty members] can help new science teachers feel valued, making them more motivated and confident in their abilities, which will help strengthen the science education [core group] within the academic institution.” (P6)

FIGURE 1. THE COMPLEMENTARY MIND MAPS FOR THE *TYPOLGY OF ETHICS OF CARE-DRIVEN INFORMAL PROFESSIONAL LEARNING*



Source: Constructed by the Lead Author (2024) at <https://mindmapai.app/>

For them, learning from the cautionary tales and best practices of experienced educators offers a supportive approach to comprehending their roles as science teachers, moving beyond the confines of generic professional programs that may not align with their specific areas of interest. In science education, despite varied positional identities among teachers (Moore, 2008), mentors are sensitive to their mentees' plights. Filipino workers view colleagues as extensions of themselves, expressing '*Pagpapakatao*' (Humanity) to sustain harmonious interactions (Landa-Jocano, 2006). As noted by Participant 7:

“Every faculty [roster] certainly has teachers that are [insensitive] and lack the qualities of being a great mentor. Imagine having a genuine mentor who can instil pride and let a new teacher thrive. My current mentor is like that.” (P7)

3.1.2. Collaboration as a Fostering Antecedent

As the participants make sense of their takeaways from their informal mentors, they recognized that connections in the academic institution are best formed through a steady process of engaging in joint ventures with other teachers. While these opportunities are typically provided through professional learning communities and formal mentorship programs, the participants were not disadvantaged despite lacking such stable support. Professional development platforms remain tailored to previous generations of teachers (Blonder & Vescio, 2022), highlighting the need for adjustments to accommodate Gen Z educators. Participants 1 and 5 stated:

“I believe in collaboration more than individual contributions. It is not about which generation contributes more; rather, it is about working together.” (P1)

“For me, collaboration is the most effective approach. If [a specific workplace learning] happened to my mentors during their early years, [then] I want to learn from their experiences so that I can apply that new knowledge and skills to my current situation.” (P5)

Their mentors instilled that achieving multiple frontiers often requires mutual effort and dynamic alliances. This perspective is rooted in the work of Lopez (2013), who states that collaborative mentorship fosters diversity and equity. By the same token, the teachings of their mentors reflect the Filipino value of ‘*Malasakit*’ (Compassion) for other’s holistic development (Landa-Jocano, 2006). In today’s educational landscape, teachers organize professional networks to exchange effective strategies (Girardet, 2018). Participant 4 brought up:

“I believe collaboration between [the] mentor and mentee should promote both holistic and professional growth. In my experience at the public school, we have informal collaboration sessions twice a week, which have been really beneficial to us.”

3.1.3. Perspective-taking and -making as Fostering Antecedents

As the participants navigated the relational aspects of their development as educators, they recognized that engaging with other teachers is a reciprocal process. While they recognize the value of emulating exemplary colleagues, they also acknowledged that blindly following them can result in a distorted sense of purpose. This purview reinforces the notion that science teachers exercise discernment even within peer learning (Soncini et al., 2024). The growth mindset among radical cohorts suppresses domineering and dismissive attitudes in organisational citizenship (Obmerga, 2024). Participants 1 and 5 indicated:

“When I was new, talking to colleagues helped me understand that I could always seek guidance whenever problems arose. This support system is particularly important now, as we are hiring many new teachers and assistant teachers.” (P1)

“[My mentor] was always open to discussing new and innovative ideas, inspiring us to share more and delve more into something. Also, I have observed that she always adds something significant to what has been shared, making the learning experience more memorable and noteworthy.”

They were one in sharing the view that care-driven mentorship benefits both mentees and mentors. For them, there are instances to assert their ideas. However, they should also learn to adapt their mentors’ insights, particularly those from challenging science classroom and laboratory experiences. Whether through partnerships or providing assistance, ‘*Pakikisama*’

(Camaraderie) concretizes group cohesion (Landa-Jocano, 2006). Due to the uncharted nature of Gen Z as professionals, this research is among the few studies indicating that they are open to diverting from their ideas to explore other compelling ones.

As disclosed by Participants 1 and 9:

“Since mentors have been in the teaching profession for years, they already know the strategies to make the job easier. I should listen to those experiences.” (P1)

“Teaching my science mentor something in the future would be fulfilling, showing my growth and improvement. I think my mentor would appreciate the new learning experience.” (P9)

3.1.4. Sense of Synergy and Diversity as Formative Impacts

The participants advanced the notion that the organisation’s team dynamics and social cohesion are critical springboards that could lead to resounding teacher success. Admittedly, while they still find the proverbial rope to understanding the ebb and flow of their respective academic institutions’ culture and disentangling the complex web of its citizens’ personalities, they know they must turn their backs on an individualistic working style. In the literature, co-caring and belonging are essential for benevolent professional relationships (Joseph et al., 2022). Participants 3 and 4 averred:

“I feel that the primary goal of being a genuine and caring science mentor — regardless of the values they hold — is to help other professionals learn.” (P3)

“I feel fortunate to have a mentor who has guided and shaped me every step of the way. I feel comfortable sharing my thoughts and ideas, and I am not embarrassed by criticism. This openness fosters unity and harmony, strengthening the relationship and creating a positive and supportive environment.” (P4)

They also recognized that diversity enriches organisational dynamics and became committed to institutional initiatives that project the vibrance of their school. Bińczycki and associates (2023) found that Gen Z is attuned to inclusion issues and the need for a diverse workplace culture. While ‘*Mahiyain*’ (Reserved) behaviour is a common trait among Filipinos (Landa-Jocano, 2006), the participants in this study demonstrated a willingness to go beyond these norms in pursuit of professional learning. Participant 9 verbalized:

“My mentor helped me become independent by allowing me to structure my learning experience and decide on school activities, fostering creativity and autonomy inside the institution.”

3.1.5. Collective Description of the First Theme and its Sub-themes

In essence, the *Mindful Member Professional Learner Persona* capitalizes on the participants’ open and in-depth engagements with the people in the educational organisation (*Symbiotic*) to further learn about how to work effectively with others (*Collaborating*) and how to determine which ideas are to be advocated and side-tracked upon their collaborative experiences (*Perspective-taking and -making*) to holistically contribute to their academic institutions’ collective efforts and plurality of ideas and skills (*Sense of Synergy and Diversity*).

3.2. On *Grounded Inquirer* as a Forming Professional Learner Persona

Through the empowering encounters with their mentors, the participants expressed that resilience in learning organisational processes, despite hurdling several classroom and laboratory responsibilities, is vital for grasping how the academic institution functions. Procedural ambiguity among science teachers could result in safety risks among learners due to the technical nature of their subject (Zirkel & Barnes, 2011). To mitigate such risks, Filipinos often engage in ‘*Pag-usisa*’ (Inquiry) and ‘*Pagkilatis*’ (Scrutiny) to ensure a comprehensive understanding of situations (Landa-Jocano, 2006). Participants 7 and 9 conveyed:

“Entering the field is not a joke, as we are already expected to be competent and true to what we told our employer during the interview. The pressure we are dealing with as science teachers is at a higher level compared to other subjects. Imagine, you are a science [education] major graduate and, yet, you do not know the school processes.” (P7)

“Daily check-ins allow [the] mentor and mentee to discuss class facilitations, addressing any issues and finding solutions together.” (P9)

As budding educators, they recognized that self-doubt and hesitation could impede their professional growth and lead to career stagnation. They also narrated that their mentors inculcated the need to fully acclimate to their roles before challenging existing practices. In the literature, effective mentorship anchored in caring fosters community integration and professional agency development among mentees (Mooney-Simmie & Moles, 2011). As explained by Participants 1 and 4:

“Mentorship provides assurance to new teachers, helping them feel they are not alone and that everyone is working to figure things out together.” (P1)

“Adapting to a new environment and starting a teaching career has been difficult, especially with the additional ancillary tasks in the Department of Education.” (P4)

3.2.1. *Process as a Focal Point (Diagnosis)*

The participants’ mentors conveyed that the transitory nature of their learning, arising from unplanned observations and random assignments from mentors, necessitates an understanding of their schools’ internal dynamics before circumventing any protocols in the pursuit of efficiency. This proposition aligns with the findings of Bauer and associates (2007). According to them, role clarity helps new professionals mitigate role confusion, cultural misalignment, and performance pressures during their initial adjustment. Participant 1 expounded:

“One of the essential skills my mentor taught me is serial tasking, especially when handling multiple responsibilities. My mentor encouraged me to focus on one part at a time and customize it to fit my style. This flexibility allowed me to manage the workload effectively.”

Rather than passively expecting procedural insights, participants felt compelled to observe their institutions’ complex and evolving processes, helping them identify their potential building and stumbling blocks. While institutions often pair novice teachers with peers for support, the lack of an adjustment period can diminish morale and sow confusion (Erichsen & Reynolds, 2020). Although this study’s cultural context emphasizes virtues like ‘*Matiisin*’ (Endurance) (Landa-

Jocano, 2006), it does not guarantee that the Gen Z participants will subscribe to this ethic in the long run. Participants 1 and 4 mentioned:

“There is a need to immerse in the school’s processes and procedures. These are the only viable routes to be firmly implanted to the system” (P1)

“I believe it is essential for mentees to feel they have some authority over their decisions, while still receiving valuable guidance.” (P4)

3.2.2. Forward Thinking as a Fostering Antecedent

Being aware of the nuances underlying their school-related undertakings has enabled participants to avoid aimless navigation within their organisations. Albeit regularly faced with individual pedagogical challenges in their respective subjects, as motivated by their mentors, they have not dismissed the notion that they can contribute to institutional progress by being open to goal-driven deviations in their practices. This view aligns with future thinking, which, when initiated by a caring mentor, fosters a sense of possibility during teacher preparation (Cipollone et al., 2018). However, science educators are often encouraged to temper bold ideas to meet numerous safety standards (Abdelnasser, 2023). Participant 3 underscored:

“[My mentor] helped me adjust to the school system and culture by, for example, giving me a schema of what I can anticipate from each class.”

For them, even if they are just at the onset of their careers, the trailblazing mentorship they received has pushed them to seize rare opportunities to make a difference and promote advocacies. Gen Z employees are known for incorporating creativity into their work (Racolta-Paina & Irini, 2021), a trait echoed in Filipino culture as ‘*Malikhain*’ (Creative) when facing challenges (Landa-Jocano, 2006). While Gen Z is labelled for pursuing radical innovations, it remains to be seen whether they will continue to pursue daring actions without a full understanding of organisational processes. Participant 2 stressed:

“I know it is important for new teachers to be creative and to use methods that fit his or her strengths as an individual. If given the chance, I will create an environment where one feels safe to try something new. This would enable them to take risks in planning lessons and classroom management.”

3.2.3. Periodic Auditing as a Fostering Antecedent

Despite being indifferently treated by their other colleagues, their mentors’ generous accommodation has instilled in the participants that there is nothing wrong if they question their institutions’ system and longstanding practices. Tracing its connection in the literature, academic mentors step out of the bounds of standards to create conducive learning experiences for their mentees (Leonard, 2012). While Gen Z is known for expressing dissenting opinions when dissatisfied, Filipino cultural norms emphasize ‘*Magalang*’ (Respectful) behaviour even in disagreement. Participants 1 and 6 exclaimed:

“There is no perfect school system. My mentor was very clear on that aspect. Hence, it is crucial for beginning science teachers to inquire on critical academic processes for the purpose of his or her enlightenment.” (P1)

“I believe that questioning the processes will allow me to have a stronger foundation and will provide me with an opportunity to adapt and refine certain strategies I need at work.” (P6)

Whether in teaching strategies, laboratory innovations, or school practices, as guided by their mentors, they understood that respectfully suggesting improvements would not be seen as resisting tradition. A restrictive approach to educational progress can stifle an organization’s competitive edge (Miotto et al., 2020). With the Philippines’ perennially low performance in international learning assessment metrics, such as TIMSS, Filipino science educators are motivated to exceed expectations, even amid scarce resources and support constraints (Carino, 2022). Participant 3 declared:

“Emphasizing how much personal branding matters in education will make them realize that individual perspectives can bring something great to the institution.”

Sense of Reflexivity and Proficiency as Formative Impacts

Based on the participants’ reflections, they emphasized that attaining a fundamental mastery of workflows should be accompanied by reflective practices to assess how they could most effectively integrate into the organisational structure. This assertion affirms the notions of Chitpin (2011), which stated that mentorship with utmost care should include opportunities for reflection. Although Gen Z has been stereotyped as lacking internalizing tendencies and science teaching calls for objectivity rather than reflective actions, this study’s participants demonstrated that Gen Z educators are capable of reflexivity, allowing them to be capacitated. Participants 1 and 8 pointed out:

“My mentor has inspired me to always pause to internalize, whether I am doing fine or otherwise in the school. This has helped me to make informed choices about my adjustment.” (P1)

“Caring mentors encourage self-reflection and boost their mentees’ confidence by providing constructive feedback and celebrating successes, leading to mentees feeling more self-aware and resilient.” (P8)

For the participants, their novice years as educators will pass quickly, often before they realize it; hence, they need to nurture their curiosities while becoming accustomed to the institutional processes. Apart from their mentors’ teachings, a holistic understanding of the organisational conditions could serve as a wellspring for them to become proficient in their practices. Beyond technical excellence, novice teachers benefit from peer guidance encouraging reflection-in-action and reflection-on-action (Moghaddam et al., 2020). The Filipino action of ‘*Pagsusuri*’ (Assessment) is related to self-reflection and serves as a pathway for ‘*Kahusayan*’ (Mastery) (Landa-Jocano, 2006). Participant 5 said:

“I am always open to accepting any kind of remarks, whether positive or negative; it just means that I am still learning and in the process of achieving more. Remarks like this have the power to motivate me to do more and put more effort in order to achieve the target outcomes.”

3.2.4. Collective Description of the Second Theme and its Sub-themes

Summarily, the *Grounded Inquirer* Professional Learner Persona hinges on the participants’ understanding the educational organisation’s processes (*Diagnostic*) to gain baseline insights about its effectiveness and shortcomings to further learn about how to make innovative yet incremental changes (*Forward Thinking*) and how to habitually assess the procedures and

operations (*Periodic Auditing*) to holistically develop an informed and deeply-seated practice on their stint in the academic institution (*Sense of Reflexivity and Proficiency*).

3.3. On *Utility Thinker* as a Forming Professional Learner Persona

Reflecting on their interactions with caring exemplars, the participants noted that their mentors encouraged them to consider both the immediate and long-term impacts of their contributions to the institution. In the literature, appreciative actions that could induce organisational changes are critical in today's stringent school climate (Cherkowski & Walker, 2019). While Gen Z is often depicted as individuals who lack persistence due to the absence of delayed gratification, the participants revealed a different circumstance. Obmerga (2020) posited that grit, a crucial work virtue, may also be evident in younger generations of educators. According to Participants 4 and 9.

"I now value gradual outcomes more than instant outputs because, in teaching, results are not always visible right away." (P4)

"My mentors taught me to value outcomes over immediate outputs, as long-term goals create a more meaningful impact, especially in instilling [the] values and attitudes necessary for success." (P9)

As they are just beginning to identify their niche in the school, the advice they have received from their mentors has taken root in their minds, emphasizing that their efforts must be built around their takeaways to enhance their outputs, regardless of how small or inconsequential those efforts may seem. Science-related educators and practitioners are usually focused on operationalizing their outputs, demonstrating a willingness to undergo the tedious process of experimentation to implement evidence-based practices (Luft et al., 2019). Filipino workers are recognized for their '*Mapagpunyagi*' (Diligent) behaviour (Landa-Jocano, 2006). Participant 5 revealed:

"I think we, the Gen Z science teachers, follow a set of routines that are rooted in research-based pedagogies, personal experiences, and maybe the impact of globalization."

3.3.1. *Product as a Focal Point (Pragmatics)*

As their mentors encourage, bringing their progressive ideas to fruition is not intimidating for the participants. It dawned on them that there is no better testament to their growth in the school than paving the way for outcomes that might benefit their colleagues' work arrangements and their students' learning experience. Vikaraman and fellows (2017) suggested that a caring relationship between mentors and mentees, supported by school leadership, can lead to impactful practices. Science educators face the challenge of ensuring that their instruction transcends the classroom and resonates with learners' everyday lives (Ferreira & Morais, 2020). Participant 1 and 8 articulated:

"My mentor was very specific to always set the standards high when it comes to the deliverables that I generate in the school." (P1)

"Exposure to the school culture, unique values, traditions, and unwritten rules allows me to reshape my techniques and ways of teaching to benefit my students and co-workers." (P8)

Through their incremental efforts while learning about the organisational processes and products, they could consolidate their gains for as long as they remain true to their mentors'

challenge to find the significant implications of their contributions. In the Filipino culture, decisions and actions are often driven by ‘*Kabuluhan*’ (Significance), reflecting a social responsibility to make a difference. While Gen Z workers are often stereotyped as entitled, the study findings suggest their growing maturity as active contributors within the school system. Participant 9 emphasized:

“Rushed outputs are just band-aid solutions. Gradual outcomes are structured, lasting longer, and adding more value [to the school and students].”

3.3.2. Benchmarking as a Fostering Antecedent

The participants remained optimistic that the processes and teaching traditions within their respective organisations would be revitalized through their dedicated professional efforts. Driven by their mentors to also check the courses of actions of their colleagues, they sought other educators’ best practices, aiming to emulate their exemplary actions. Despite the prevalence of negative workplace behaviors like ‘*Inggit*’ (Envy) and ‘*Crab Mentality*’ (Fear of success) in Filipino culture (Landa-Jocano, 2006), the participants exhibited a celebratory attitude toward the achievements of their peers. Participants 2 and 10 asserted:

“There are numerous insights that I can always consciously lift and later emulate from my mentors and colleagues. If only the new teacher can notice these profound lessons, [then] he will be unstoppable in terms of progress.” (P2)

“My mentor serves as my standard and [I also examine] what other teacher demonstrates. It gives the impression that I also want to be like them.” (P10)

To properly fulfil their teaching duties, they have realized they need to become instrumental in discontinuing the faulty practices and share their resources to ensure that all their deliverables conform to the standards. As evidenced in the study, this generation’s actions suggest a shift towards internal benchmarking rather than competitive benchmarking to achieve higher efficiency. Science teachers are compelled to evaluate their performance against established success indicators to ensure safe and successful learning experiences (Lewis et al., 2021). Participant 2 clarified:

“I can guide others by using technology through peer tutorials. This way, it will give the experienced teachers the opportunity to pass on knowledge regarding the new tools and resources to the new teachers, enabling them to use technology effectively in their classrooms.”

3.3.3. Reciprocal Feedbacking as a Fostering Antecedent

Inspired by their desire to set the tone within the organisation, the participants advocated for the improvement of the key instructional and operational outputs they produce, despite being newcomers. While their focus remains on teaching, they never presumed that they knew everything, as they have actively solicited recommendations to refine their work while offering insights to improve the outputs of others. By providing timely feedback, Smith and colleagues (2020) argued that new teachers can better align their actions with the institution’s goals, contributing to a higher quality of education. Participants 3 and 7 affirmed:

“Beginning educators, whether in science or not, always have a voice. They should seize that opportunity to also guide their mentors and fellow faculty members. No one has the monopoly

of knowledge and information about the school. At times, streams significant information is coming from the new teachers since they are exposed in the field.” (P3)

“My mentor continuously showered me with feedback, criticisms, and observations about my professional conduct. I preferred it that way and I was able to adjust.” (P7)

From their narratives, their mentors assumed a crucial role in critiquing and enhancing their practices. Withholding feedback, as noted by Keiler and fellows (2023), indicates that mentors are not fully invested in their mentees’ growth. For them, closely guarding their optimal strategies to attain a desirable outcome would only hinder them from achieving landmark successes. Their proactive stance can be linked to the Filipino trait of ‘*Diskarte*’ (Practicality), often employed to optimize resources and expedite problem-solving. Participant 4 reported:

“My mentor is always careful to ensure that my feelings are not hurt. Even when delivering negative feedback, she finds ways to lighten the burden on my heart.”

3.3.4. Sense of Quality and Sustainability as Formative Impacts

Making a difference in their organisations, especially at the level of a comprehensive validation of their outputs, was an unsettling surprise for the participants as it always did not go as anticipated. As their mentors appeased their apprehensions, they remained committed to infusing quality into their work. This stance echoes the precepts that Aspfors and Fransson (2015) advanced that the mentors’ dedication to honing their mentees’ gap-riddled skills is a testament to their concern for their productivity. Previous generations of Filipino workers have relied on ‘*Kayod*’ (Perseverance), ‘*Oido*’ (Strategy), and ‘*Libro*’ (Formal studies) to overcome occupational deficits (Franco, 1988). Participants 1 and 8 specified:

“Impactful actions are not subjective. There are actually objective aspects to measure them. Fortunately, my mentor really challenged me to always think of the quality of my activities.” (P1)

“If the mentee becomes more reflective about the impact of his teaching practice and demonstrates better problem-solving abilities, this shows that the mentor is successful [in] developing the mentee’s mindset of continuous improvement.” (P8)

In light of unprecedented work challenges, their mentors taught them to remain resolute, recognizing that their lack of voice and experience could be offset by their steadfast commitment to quality teaching and professional learning. High-quality work is integral to sustaining instructional reforms in science education (Tekkumru-Kisa et al., 2021). For them, what stands in the way eventually becomes the way; hence, they attempt to carry on and break the underwhelming work cycles that produce mediocre results. According to Participants 2 and 4:

“The experiences [with my mentor] have assisted me in growing further as a teacher, and I have the zeal to continue learning from them in the near future.” (P2)

“I always strive to meet or exceed [my mentor’s] expectations because of the trust she placed in me. While my mentor allowed me to take control of my work, she continues to guide me to ensure I stay on the right path.” (P4)

3.3.5. *Collective Description of the Third Theme and its Sub-themes*

Tellingly, the *Utility Thinker* Professional Learner Persona relates to the participants' iterative consideration of the outcomes of their undertakings in the organisation (*Pragmatic*) to explore foundational elements of what makes their outputs functional to further learn what to adopt and disregard from the exchange of best practices and resources (*Benchmarking*) and what to include and exclude in the provision of remarks (*Reciprocal Feedbacking*) to holistically form a strict adherence to the standards and continue their desirable routines (*Sense of Quality and Sustainability*).

4. Conclusion

The novice years among educators, from the sciences or other disciplines, represent universal and cross-cultural encounters that transcend generations. Although mentorship practices vary from organization to organization and may impact each teacher differently, the role of caring mentor-leaders, despite being informal in this inquiry, is undeniably significant in shaping the early careers of teachers who continue to yearn for organizational nurturing. This qualitative inquiry focused on the early impacts of Ethics of Care, as espoused by Gilligan (1987) and extended by school mentors, on the informal professional learning of Filipino Gen Z novice science teachers. The phenomenological study developed the *Typology of Ethics of Care-driven Informal Professional Learning* among Filipino Generation Z novice science educators through thematic analysis of transcribed field texts. This typology encapsulates the pivotal role that informal school mentors' Ethics of Care play in the professional growth and development of the participants. The dynamic persona highlights the key characteristics fostered in participants through transformative mentoring by their exemplars. These personas encompass the foci, antecedents, and impacts of their mentors' dynamic tutelage. The study's theoretical contributions, practical implications, limitations, and future directions are discussed below.

4.1. Theoretical Contributions

This research makes three significant theoretical contributions. *First*, while existing studies have explored teachers' flourishing due to mentorship (Cherkowski & Walker, 2019), novice teachers' perspectives on mentoring (Löfström & Eisenschmidt, 2009), self-directed learning among beginning educators (Mokoena & van Tonder, 2024), onboarding of Gen Z workers (Chillakuri, 2020), and professional learning of science teachers (Blonder & Vescio, 2022), none have specifically addressed the early impacts of informal professional learning on Gen Z science teachers. This study is one of the first empirical inquiries to investigate this unexplored area. *Second*, an exhaustive review of the literature reveals that, apart from Oberhauser and Caretta's (2019) work on Ethics of Care in feminist mentoring within a neoliberal academy, there is a scarcity of research from reputable sources that elevate the critical role of Ethics of Care in informal professional learning and school mentorship, particularly in developing countries like the Philippines. *Third*, this inquiry introduces the *Typology of Ethics of Care-driven Informal Professional Learning* among Filipino Generation Z novice science educators. While there are related studies on capacity-building and identity formation among non-science teachers (e.g., Schepens et al., 2009; Trust, 2012), those observational studies focused on earlier generations of budding teachers. This pioneering study is among the few inquiries that captured the collective experiences of Gen Z teachers at the onset of their careers.

4.2. Practical Implications

Additionally, this research offers four practical implications for effective mentorship and onboarding of Gen Z novice science teachers. *First*, the findings can serve as a guidepost for Gen Z novice science teachers who have recently joined or are about to join academic institutions. By engaging in reflection and conditioning, they can optimally leverage the identified personas to prepare for their professional roles based on their unique circumstances. *Second*, academic communities lacking structured mentorship programs can benefit from this study, particularly seasoned educators mentoring younger faculty members. The insights help determine which aspects of mentorship to instil across disciplines, enriching role-making initiatives tailored to this promising cohort of educators.

While mainstream professional learning mechanisms are integral to contemporary educational organizations, weaving informal professional learning into such mentoring protocols can enhance mentorship practices and better support Gen Z educators. *Third*, the study's future directions provide a foundation for complementary research to benefit subsequent generations, such as Generation Alpha. Understanding how their proximate age group adjusted during critical career junctures could help them harness their self-propelled capabilities as they integrate into educational institutions. *Fourth*, the study's resulting typology offer a conceptual launching pad for advancing cross-cultural research, enabling future investigations to critically examine how diverse cultural paradigms and (non-)educational systems mediate the applicability, adaptability, and relevance of Ethics of Care-driven Informal Professional Learning.

4.3. Limitations

The utilization of Husserlian phenomenology enabled participants to articulate and clarify the essence of their lived experiences; however, this design entails inherent limitations that must be acknowledged to frame the findings within their appropriate scope. Central among these is the relatively small sample size ($N=10$), which, while sufficient to achieve data saturation in phenomenological inquiry, constrains the generalizability of the findings beyond the specific context studied. This limitation is particularly significant given the nuanced and context-dependent nature of the phenomenon under investigation stemming from a given cultural reality.

Although rigorous measures such as member checking, bracketing, and the critical friend technique were employed to enhance trustworthiness and reduce researcher bias, the intersubjective nature of the responses introduces variability that may not fully capture broader patterns of the lived experience. Hence, the study only offers a *moderatum* generalization, as the experiences of novice teachers from (non-)science fields, diverse cultural orientations, and varied mentorship environments could diverge significantly due to individual differences and distinct worldviews. Future studies could address these limitations by incorporating larger, more diverse samples and cross-cultural and comparative analyses across multiple contexts to deepen the understanding and applicability of the phenomenon.

4.4. Directions for Future Research

Apart from replication efforts of the study in different professional and cultural realities, future researchers may also consider cross-cultural comparisons of care-driven practices among

informal school mentors in communitarian versus individualistic societies. Additionally, interested scholars may probe the longitudinal elements of the proposed typology using other research designs, such as institutional ethnography and constructivist grounded theory, to verify and observe these components in various contexts. Furthermore, the qualitative study's findings provide a promising springboard for future quantitative studies, such as Covariance-Based Structural Equation Modeling for testing theoretical models and Exploratory and Confirmatory Factor Analysis for developing psychometric scales about the facets of the typology. These research designs promote methodological pluralism, enabling a more comprehensive exploration of the phenomenon's multifaceted dimensions.

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Data supporting the conclusions of this study can be made available upon reasonable request from the corresponding author.

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University Teachers' Conceptions of Their Role in Teaching Problem-Solving

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Abstract

Equipping young adults with problem-solving skills is critical in today's knowledge economy. Universities have increasingly adopted approaches like problem-based learning (PBL) to foster critical thinking and independent learning. However, while extensive research exists on the benefits of PBL, less attention has been given to studying tutors' conceptions about their role from a phenomenographic research perspective. This study addresses this gap by investigating university tutors' conceptions of their roles in teaching problem-solving skills within a PBL environment. Data from interviews with 15 tutors identified a progression of conceptions, from creating a safe learning environment to fostering independent learners. Each conception affects practices in tutorial groups, shaping inquiry depth, collaboration quality, and transferable skills development. The findings highlight the importance of understanding tutors' roles in enhancing the potential of PBL to equip students with essential problem-solving skills. By uncovering the diverse ways tutors conceive their role, this research offers actionable insights for academic developers and educators aiming to refine teacher training programs and foster student-centred learning in higher education.

Keywords/key phrases: problem-solving, student-centred learning, higher education, role of teacher, problem-based learning

1. Introduction

In today's rapidly evolving "knowledge economy," the skill of memorising facts and procedures is insufficient in itself. The Organization for Economic Co-operation and Development (OECD) (2018; Foster & Piacentini, 2023) identifies complex problem-solving as one of the most sought-after skills for graduates in fields requiring advanced expertise, such as management, technology, and professional work. Similarly, the European Skills Agenda underscores the necessity of fostering

transversal skills, including decision-making, problem-solving, communication, adaptability, etc. and calls on higher education institutions to address this gap (European Commission, 2016, 2020).

Although universities are trying to respond to this challenge to equip students with problem-solving skills, misconceptions and challenges occur about how it should be taught (Van Merriënboer, 2013, Dolmans et al., 2015). Approaches such as interdisciplinary learning, inquiry-based learning, and problem-based learning (PBL) have recently been gaining prominence. PBL in particular has drawn significant attention for its potential to develop critical thinking, independent learning, and transferable problem-solving skills. Rooted in student-centred learning pedagogy, PBL requires students to engage with real-world problems, fostering deep inquiry and self-directed learning (Dochy et al., 2003).

Despite the growing emphasis on PBL, there are notable gaps in understanding how tutors' conceptions of their roles influence its implementation. Research highlights that teachers' beliefs and attitudes significantly shape their instructional strategies and student outcomes. Foundational studies in this area have established key theoretical frameworks that continue to inform contemporary research (Chan & Elliot, 2004; Trigwell et al., 2002). However, little attention has been given to how PBL tutors perceive their roles and how these perceptions impact the development of students' problem-solving abilities (Hendry, 2009, Chng et al., 2011, Azer 2005). While factors such as institutional support and student dynamics are significant in the PBL environment, understanding tutors' conceptions is crucial. This understanding helps address the challenges of implementing PBL effectively and enhances its potential to equip students with skills demanded by the modern workforce.

This study is particularly relevant for educators, academic developers, and policymakers interested in enhancing teaching strategies for skill development in higher education. Understanding the developmental spectrum of PBL tutors' roles can inform teacher training initiatives, ensuring that tutors are well-equipped to help students transition from structured learning environments to becoming independent problem-solvers. For individual tutors and higher education teachers, this research provides a reflective lens to evaluate and refine their practices, fostering a deeper commitment to student-centred learning.

2. Theoretical Framework

2.1. Conceptions of Teaching and Learning

Conceptions of teaching and learning form the foundation of this study, providing a lens through which to understand teachers' conceptual understanding of certain phenomena. The relationship between beliefs and practices has been a focal point of educational research. Kwan and Kember (2000) highlighted this connection, building on Kember's (1997) model, which demonstrates how academic conceptions of teaching influence teaching approaches.

Teaching approaches are typically categorised as content-centred or learning-centred. Content-centred approaches prioritise the transmission of material, focusing on delivering knowledge efficiently. Learning-centred approaches, by contrast, emphasise facilitating student learning and fostering independence. Interviews conducted by Kwan and Kember (2000) revealed two corresponding conceptions of teaching: "Teaching as the transmission of knowledge," which aligns with content-centred approaches, and "Teaching as learning facilitation," which aligns with learning-centred approaches. Their findings showed a strong alignment between beliefs

and practices, with 88.9% of lecturers who viewed teaching as knowledge transmission adopting content-centred approaches and 87.5% of those emphasising facilitation adopting learning-centred approaches. These findings underscore how teachers' conceptions serve as a cognitive framework that influences not only their instructional choices but also student engagement and learning outcomes (Postareff & Lindblom-Ylänne, 2008).

This theoretical grounding establishes the relevance of studying tutors' conceptions, as it allows us to examine how their implicit beliefs contribute to PBL facilitation. However, this study does not seek to determine a correlational relationship between conceptions and practice but to broaden the discourse on how tutors understand their own roles in PBL and contribute to deeper pedagogical reflection. Instead, we focus on mapping different levels of awareness of tutors' conceptions.

2.2. Variation Theory of Learning and Its Role in Higher Education Teachers' Professional Development Research

Variation theory (VT) of learning explains how individuals come to perceive, understand, and experience a phenomenon by recognising its critical aspects through structured variation (Marton, & Booth, 1997). It is grounded in the idea that learning occurs when learners discern essential features by experiencing differences and contrasts in relevant dimensions. Variation theory has become a foundational framework in pedagogical research, providing educators with valuable insights into how students learn by identifying which aspects of a concept need to be highlighted through variation (Kullberg et al., 2024). By systematically varying instructional approaches, teachers can enhance students' engagement and deepen their conceptual understanding. Variation theory of learning, emerging from phenomenography, focuses on mapping different ways people understand phenomena and has implications for pedagogical design in higher education (Åkerlind, 2015). This theory conceptualises learning as a qualitative change in how learners experience or perceive a situation, defined by the critical aspects they simultaneously focus on and discern (Marton & Pong, 2005). By exposing learners to specific patterns of variation and invariance, they can better discern critical aspects, enhancing their professional capabilities to handle novel situations.

This theory's development led to studies on teachers' professional development. Similar to how VT helps educators understand how students perceive concepts differently, it can also reveal how teachers experience teaching practices in different ways (Lo, 2012). This perspective is particularly useful for professional development programs, as it helps tailor training initiatives by addressing the variations in teachers' pedagogical understanding and instructional strategies. Thus, Variation Theory is not only a tool for improving student learning but also an essential framework for understanding teacher cognition and professional growth, making it a versatile approach to education research and training (Åkerlind, 2015).

This research, grounded in variation theory and the phenomenographic research approach, and supported by the conceptions of teaching and learning framework, seeks to understand problem-based learning (PBL) teachers' conceptions of their role in order to discern qualitatively different understandings of a phenomenon. The study aims to form and construct a framework that can be used as a self-evaluative tool for educators, while also serving as a valuable asset for academic developers to assess tutors' existing conceptions and design tailored professional development programs.

Beyond addressing PBL tutors specifically, this research extends to higher education teachers more broadly, offering insights into teaching problem-solving and the role of educators in facilitating the learning process. By deepening their understanding of these concepts, higher education teachers can refine their instructional approaches and enhance their effectiveness in supporting student learning.

3. Research Objective and Question

The primary objective of this research is to explore the qualitative variations in university teachers' conceptions of their role in facilitating problem-solving within PBL tutorials. Using a phenomenographic approach, this study seeks to identify commonalities within these variations and examine how different conceptions are hierarchically related, from least to more complex understandings. Rather than focusing on disciplinary differences or experience levels, the study investigates how tutors experience and interpret their role in distinct yet interconnected ways, shaping their instructional strategies and student interactions. The outcome will be a developmental framework that helps teachers situate their own conceptions within a broader spectrum of awareness and understand pathways for growth in their facilitation of problem-solving in PBL contexts.

Research Question: How do university teachers conceptualize their role in the process of facilitating PBL tutorials?

4. Research Design

4.1. Phenomenography

Phenomenography is a qualitative research approach that explores variation in how people experience and conceptualize aspects of their world (Yates et al., 2012; Åkerlind, 2005). It focuses on a second-order perspective, examining individuals' conceptions rather than the phenomena themselves. Phenomenographic research emphasises the importance of variation in findings, with each unique statement considered valuable, regardless of frequency. The results are interpreted as revealing the collective experience of the phenomenon rather than individual perspectives. Unlike methods that simply categorise participants' views, phenomenography explores the relationships between these categories and the meanings embedded within them, offering deeper insights into the complexities of the phenomenon (Marton & Pong, 2005). This approach moves beyond generic 'right' or 'wrong' answers to highlight specific aspects and layers of understanding (Åkerlind, 2005).

Different ways of understanding are sometimes described as being more or less 'complete'. What is meant by this is that in the way phenomenography undertakes its analysis, every way of understanding discerns some aspects of the phenomenon but not other aspects. So, in this sense, every way of understanding discerns something important about the phenomenon, but not everything that is important about the phenomenon (Åkerlind, 2025, p. 32).

Phenomenographic research has demonstrated its utility in planning academic development programs (Åkerlind, 2015; Booth & Ingerman, 2015; Wright & Osman, 2018). By capturing a range of conceptions, this methodology helps educators and institutions evaluate and enhance teachers' understanding of critical teaching phenomena. The outcome space generated through

phenomenography serves as a reflective tool, enabling teachers to recognise their current conceptions and identify areas for growth (Green, 2005). This theoretical and practical application of phenomenographic research enables us to study PBL tutors' conceptions.

4.2. Participants of the study

The study was conducted among PBL tutors at Linköping University in Sweden. Over the years, PBL has been integrated into several programs across four faculties, making the university a pioneer in this pedagogical approach. The sample included 15 PBL tutors from diverse disciplinary backgrounds, ensuring a broad representation of perspectives. The selection of participants was determined by the number of tutors who agreed to participate in the study. While the initial goal was to capture a diverse range of experiences, we found that data saturation was reached within this sample. It also aligns with research design norms, where the sample size usually ranges from ten to twenty participants. The sample included both male (6) and female (9) tutors, with teaching experience ranging from less than 10 years to over 30 years. The academic qualifications of the participants varied, including professors, associate professors, and senior lecturers, representing fields such as Biomedical and Clinical Sciences, Behavioural Sciences, Health Sciences, and Computer Sciences.

4.3. Data collection and analysis

Data was collected through in-person, semi-structured interviews, allowing for flexibility in probing participants' experiences while ensuring consistency in key themes. Interviews lasted between 45 minutes to 1 hour and focused on tutors' conceptions of their role in PBL tutorials.

The research followed the set of guidelines to analyse phenomenographic data. Several authors were revised and revisited as there is not one fixed guideline for analysing phenomenographic data. Finally, we relied on Åkerlind's (2025) revised steps to analyse data, which is stated in her recent book "Phenomenography in the 21st Century: Investigating Human Experience of the World". As there are two schools in phenomenographic analysis to condense data, we employed more of a 'transcript as a whole' approach (Green, Bowden, 2009). Each transcript was read and understood as a complete conversation. "Meaning-laden" statements for the phenomena were highlighted and kept together, and a short summary of the interview was written. This way, we were able to capture the interviewees' conceptions better, taking into account their context, background, and the flow of the conversation. After familiarising ourselves with the data and identifying the meaning units, we clustered similar ways of experiencing the phenomenon. By contrasting and comparing the groups, we formed categories of description. The final step was to structure the outcome space, which in phenomenographic research means arranging categories hierarchically to show relationships and levels of completeness in understanding.

The possible bias of the researchers was mitigated by conducting dialogic reliability checks with prolific phenomenographic researchers, ensuring that the emerging categories and outcome space were critically reviewed and refined.

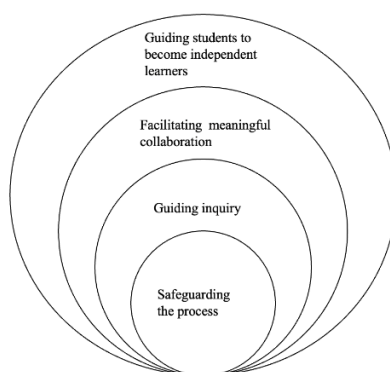
5. Results

Tutors conceived their role in four qualitatively distinct ways: (1) safeguarding the process, (2) guiding inquiry, (3) facilitating meaningful collaboration, and (4) guiding students to become

independent learners. Figure 1 illustrates how these conceptions form hierarchically inclusive categories, meaning that each subsequent category builds upon and integrates the critical aspects of the previous ones, creating a more comprehensive understanding of the phenomenon. While category 1 is considered the least complex and category 4 the most complex, this should not be interpreted as a ranking where one category is superior to another. Instead, as phenomenographic researchers suggest, these categories complement and complete each other rather than being distinct or sequential stages (Åkerlind, 2005).

The findings of this study are structured as a hierarchical outcome space, reflecting qualitative variations in tutors' conceptions of their role in facilitating problem-solving in PBL tutorials. In line with phenomenographic principles, these categories are not isolated or independent but inclusive, meaning that a tutor holding a conception in a less complex category may not yet discern all the aspects of problem-solving facilitation that are incorporated in the more complex categories. However, this does not imply a linear progression; rather, each category represents a distinct way of experiencing PBL tutoring, contributing to a broader understanding of facilitation in this context.

FIGURE 1. TUTORS' CONCEPTIONS OF THEIR ROLE



Source: The figure was developed by the authors

5.1. Safeguarding the process – Category 1

This foundational category reflects the most basic level of tutor involvement in the PBL process. Tutors focus on creating a secure learning environment where students feel confident in the group work process. By providing clear guidelines, setting agendas, and maintaining structure, they aim to reduce students' anxiety and build trust within the group. As one tutor described:

“The main responsibility of a tutor is to make the group feel secure that they are on the right track. So basically, the tutor's role is to give confidence to the group... I mean, you need to do some sort of contract with the group, but that is more formal, but you also need to do a sort of psychological contract with the group so that the group trusts...” (Response N13).

This category represents the least complete conception of a tutor's role, emphasising the importance of structure and stability. However, tutors in this category do not yet discern the broader aspects of facilitation, such as guiding intellectual inquiry or fostering deeper collaboration. Their focus remains on process management rather than actively shaping student

engagement with the content. While this provides a necessary foundation, students may become overly reliant on structured guidance and hesitate to take initiative in problem exploration.

5.2. Guiding Inquiry – Category 2

The second category highlights the tutors' role in stimulating critical thinking and reflective inquiry. Tutors actively engage students by posing thought-provoking questions and modelling reflective practices. As illustrated in the quotations below, they move beyond structuring the process to encouraging students to explore problems in depth.

“So I would say... if I had to pin it down, I would be the one asking questions to help the students to think and to sort of Socratic thinking, Socratic questioning. Where in order to get deeper into the problem, you ask questions to get deeper into the problems and help you reflect” (Response N15).

This category expands on the first by adding complexity to the tutors' role by acting as a facilitator of inquiry. PBL tutors who hold this conception about their role tend to master the skills of asking critical questions. However, they find it difficult to balance this role by assisting students to reach the final goal or the final solution of the problem.

5.3. Facilitating Meaningful Collaboration – Category 3

This category emphasises the importance of fostering productive group dynamics. Tutors aim to help students move past surface-level discussions to engage deeply with each other's ideas. As one tutor shared:

“It's a lot about just learning PBL structure and working in a group. A lot of the students have bad experiences with group work. And I say group work, okay, you do this, and you do that, and these students never help. However, I need to get the students to understand that they are here to help each other and that when they meet, they will reach further than if they separate and do one thing each. I don't want them to only report what they read in the previous week, but to share the knowledge and participate in knowledge construction by meaningful communication” (Response N11).

This role includes guiding students to engage critically with peers' contributions and promoting a collaborative environment that builds on earlier conceptions. Tutors in this category enable students to co-construct knowledge through dialogue and teamwork. In practice, guiding meaningful collaboration requires a facilitator who administers the process (category 1) and who can guide inquiry (category 2). In practice, it involves helping them revisit previous discussions, wrap up where they left off, and recognise what they might have overlooked. Tutors can encourage deeper engagement by reminding students of past arguments, prompting connections between different perspectives, and guiding them to critically assess their reasoning. At the same time, this process must not turn into a rigid structure where students simply report their readings or prior conclusions. Instead, the goal is to encourage active knowledge construction through ongoing reflection and discussion.

5.4. Guiding Students to Become Independent Learners – Category 4

The final category represents the most complex and inclusive conception of the tutor's role. Tutors focus on helping students become independent learners capable of self-organising, self-evaluating, and transferring their skills beyond academic contexts. As one tutor expressed:

“So I mostly want to make sure that students develop their own capacities for guiding their own work. That's the whole point of PBL, as I see it. So, I want to ensure that they can self-organise, self-evaluate and become reflexive learners. That's the most important task” (Response N3).

This category integrates and transcends the previous roles, emphasising self-reflection, autonomy, and lifelong learning. Tutors in this conception emphasise that their role is not to control or limit students' learning paths but to create an environment where they are encouraged to explore topics of personal interest within the discussion. This means allowing students to self-organise their learning process and recognise how their interests connect to the broader problem under investigation. This conception also acknowledges that while structure, inquiry, and collaboration are all critical aspects of PBL facilitation, they must ultimately serve the broader goal of developing self-directed learners.

6. Discussion

The findings of this study align with and extend prior research on the roles and conceptions of tutors in PBL. The four identified categories – safeguarding the process, guiding inquiry, facilitating meaningful collaboration, and guiding students to become individual learners, resonate with existing frameworks, but also offer unique perspectives as they demonstrate tutors' expanding awareness of their role. By illustrating how different conceptions of facilitation build upon one another, this framework offers a novel, self-evaluative tool for tutors to reflect on their practice and develop a more nuanced understanding of problem-solving instruction.

A limited focus on only one category of facilitation, without recognising the broader interconnected aspects of tutoring in PBL, may constrain both instructional effectiveness and student learning outcomes. When tutors do not discern the more complex dimensions of facilitation, they may unintentionally restrict students' ability to engage in deep, independent problem-solving. For instance, if a tutor primarily focuses on safeguarding the process, students may become overly reliant on structured guidance and fail to develop critical inquiry skills. Conversely, if a tutor focuses solely on guiding inquiry but neglects collaborative dynamics, students may engage in deep questioning yet struggle to co-construct knowledge effectively within the group. Similarly, if meaningful collaboration is emphasised without fostering student independence, learners may become skilled in teamwork but lack the ability to regulate their own learning beyond structured discussions. This suggests that PBL tutoring is most effective when tutors recognise how these conceptions build upon one another, ensuring that students develop not only structured problem-solving habits but also the ability to think critically, collaborate meaningfully, and take ownership of their learning. Without this integrative awareness, students may engage with problems in a fragmented manner, limiting the transformative potential of PBL as a learning approach.

The role of ensuring a structured and secure learning environment is consistent with findings by Maudsley (2002), who identified that PBL tutors often prioritise creating a supportive space

where students feel confident and focused. This role is particularly critical in the initial stages of PBL, as students acclimatise to self-directed learning. However, Maudsley also noted that some tutors struggle with knowing when and how to intervene, which aligns with the challenges observed in this study. The emphasis on structure and security in the "safe" role might be more pronounced in contexts where students are new to PBL methodologies or lack prior exposure to collaborative learning frameworks.

The category of guiding inquiry reflects a shift from a structured approach to one that emphasises critical thinking and reflection. Hendry (2009) identified similar roles, where tutors focus on posing timely questions and guiding students through deeper explorations of problems. This aligns with the notion of "Socratic questioning," highlighted in this study as a method for encouraging students to critically analyse problems. However, while Hendry emphasised the importance of tutors' content knowledge, this study reveals a balance between subject expertise and the ability to facilitate independent inquiry without providing direct answers. The findings also correspond to Savery (2006), who argues that effective facilitation requires an understanding of how to promote self-directed learning while maintaining engagement.

The role of fostering collaboration builds on research by Li and Chen (2018), who found that PBL tutors often oscillate between directive and supportive roles. This study's emphasis on ensuring deep, meaningful group discussions contrasts with the more directive tendencies observed in some cultural contexts, such as China, where tutors often dominate the learning process due to traditional hierarchical teacher-student relationships. The tutors in this study demonstrated a more facilitative approach, ensuring that discussions were student-led while challenging students to justify their ideas and engage with one another critically. While it may not always be possible to directly adopt methodologies from one cultural context to another, exposure to different conceptions of tutoring—such as the emphasis on collaborative, student-driven learning observed in this study—can help teachers from diverse backgrounds expand their awareness of facilitation. Recognising these variations allows educators to critically reflect on their own teaching philosophies and consider how elements of PBL facilitation might be meaningfully adapted within their own institutional and cultural frameworks.

The most complex category — guiding students to become self-directed learners — reflects the ultimate goal of PBL as a pedagogical approach. This resonates with Biggs and Tang's (2007) work on fostering deep learning through self-regulation and reflection. The findings also extend Hendry's (2009) research, which highlighted the importance of helping students transfer skills beyond the immediate academic context. Tutors in this study emphasised the transformative potential of PBL, encouraging students to reflect on their learning processes and consider how their problem-solving skills could be applied in real-world scenarios.

7. Implications of the study

One of the key applications of this study lies in academic development programs, where frameworks such as the one presented in this research are often used to explore variations in educators' conceptions of their roles. By applying phenomenographic principles such as fusion, contrast, and variation, academic developers can help tutors discern critical aspects of their facilitation role and expand their awareness of how different dimensions of PBL tutoring interact (Maron et al., 2004, Åkerlind, 2008). Fusion allows tutors to integrate multiple aspects of facilitation, moving beyond procedural guidance to fostering inquiry, collaboration, and

independent learning. Contrast helps tutors recognise differences between facilitative strategies, prompting reflection on their existing practices and identifying areas for growth. By structuring training programs around these principles, institutions can enhance tutors' ability to engage with students in more meaningful and adaptive ways.

Beyond tutor development, another important application concerns student learning outcomes. The study highlights how tutors' conceptions shape the depth of student engagement, critical thinking, and problem-solving skills in PBL. Tutors who primarily focus on structuring the process may provide stability but risk limiting students' autonomy, while those who recognise the interconnectedness of structure, inquiry, collaboration, and independence can help students develop self-directed learning skills. Academic institutions can use these findings to design training initiatives that align tutor facilitation strategies with desired student learning outcomes, ensuring that students are supported in progressively taking ownership of their learning.

8. Limitations and Future Directions

While this study offers valuable insights into PBL tutor conceptions, several limitations should be acknowledged. First, the sample size could be expanded to capture a broader range of variations in tutor perspectives. A larger and more diverse sample may reveal additional nuances in how tutors conceptualize their role across different institutional and disciplinary contexts.

Second, as with any qualitative study, potential bias exists in the form of self-reported data from tutors. Tutors' descriptions of their facilitation practices may not always align with their actual behaviours in PBL tutorials. Future research could triangulate findings by incorporating student perspectives, peer observations, or tutor reflections over time to gain a more comprehensive understanding of how tutor conceptions translate into practice. Additionally, this study captures a single point in time, offering a static perspective on tutor conceptions. A longitudinal study could examine how tutor conceptions evolve with training, experience, and ongoing professional development.

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Data Availability

Data supporting the conclusions of this study can be made available upon reasonable request from the corresponding author.

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The Practice of Implementing Project-Based Learning in the EFL Classroom A literature review

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Abstract

This literature review focuses on the use and effectiveness of Project-Based Learning in teaching English as a foreign language and its significance in developing students' English language skills and 21st century skills, with special focus on critical thinking, cooperation and digital skills, which are essential skills for young people entering the workforce in the 21st century. The review was based on short-term and long-term projects with upper secondary school students and university students, applying both qualitative and quantitative data collection methods and aims to identify the advantages and challenges teachers and students face during the implementation of PBL and its effectiveness in developing students' skills. The review reveals that PBL can be an effective method in developing both students' English language skills and 21st century skills, the main advantage being facilitating student engagement by allowing them to make their own choices. Another important finding is that using PBL in the classroom may be challenging for both teachers and students due to the amount of time preparation and implementation requires and the lack of training teachers receive.

Keywords: Project-Based Learning, EFL, language skills, 21st century skills

1. Introduction

The application of project pedagogy in Hungarian schools became more and more widespread after the regime change of 1989, especially in alternative schools. Nowadays it is an accepted method in all fields of education. The National Core Curriculum of Hungary, which was introduced in 2020, emphasizes the active participation of the student in the learning process and states that the most important goal in education is developing competences that make it possible for students to apply knowledge creatively in new circumstances. In order to achieve this goal, the preferred methodologies include those facilitating the collaboration of students and multidisciplinary approaches. The Core Curriculum has set the scene for the broad application of new, student-centered methods in Hungarian schools, such as Project-Based Learning.

The necessity for change in education and the need for introducing new methodologies has been underpinned by the findings of the World Economic Forum (2020), which identified eight critical characteristics in the content of education that can prepare the workforce of the future:

global citizenship skills, innovation and creativity skills, technology skills, interpersonal skills, personalized and self-paced learning, accessible and inclusive learning, problem-based and collaborative learning and lifelong and student-driven learning. Research suggests that all of these characteristics can be addressed with the application of Project-Based Learning, making it a suitable tool for educating successful future employees.

English is the global language of communication in many aspects of life, for example in science, business and diplomacy. If we can develop students' language skills as well as 21st century skills using PBL, we might successfully prepare students for a future job market.

Despite the evident need for the use of new methodologies and the willingness on the part of decision-makers in education, there has been no systematic research to show how effective Project-Based Learning is in the Hungarian education system. The aim of this literature review is to give an overall description of Project-Based Learning, more particularly, Project-Based Language Learning, and present some recent trends in its application for teaching English on the international scene.

2. Project-Based Learning

The history of Project-Based Learning goes back to Dewey's practical method, which is based on inquiry and the student's active involvement (Dewey, 1916). Piaget's theory of education also focused on the active participation of the student in the learning process as well as the hands-on experience of learning (Piaget, 1973). Constructivists also viewed the student as an active participant in education (Vygotsky, 1978). According to Vygotsky's social constructivist theory, knowledge is gained from social interactions between people. Learning is seen as a social activity, therefore collaborative learning is the best way to learn.

We can find different definitions of projects and Project-Based Learning in the literature. According to Hedge "Project is an extended task which usually integrates language skills through a number of activities." (Hedge, 1993 p.6). Stoller (2006) defines Project-Based Learning as a system of criteria, which include having a process and product, giving students (partial) ownership of the project, extending over a period of time (several days, weeks, or months), integrating skills, developing students' understanding of a topic through the integration of language and content, collaborating with other students and working on their own, holding students responsible for their own learning through the gathering, processing, and reporting of information from target language resources, assigning new roles and responsibilities to students and teacher, providing a tangible final product, and reflecting on both the process and the product.

The most widely used definition of Project-Based Learning has been given by the Buck Institute of Education (BIE) on their webpage. They claim that "Project Based Learning is a teaching method in which students gain knowledge and skills by working for an extended period of time to investigate and respond to an authentic, engaging, and complex question, problem, or challenge."

Most works on PBL also describe the essential elements, BIE states that the seven key elements of PBL are:

- Challenging Problem or Question
- Sustained Inquiry

- Authenticity (real world context)
- Student Voice & Choice
- Reflection
- Critique & Revision
- Public Product

Project-Based Learning and Integrative of Integrated Learning are similar concepts and are often used interchangeably (Sartika, 2022). Project-Based Learning and Problem-Based Learning also share more than merely the same acronym. According to Larmer (2014), both Project-Based Learning and Problem-Based Learning can be focused on a problem and the methods share similar procedures. However, Problem-Based Learning may be more limited in scope and relate to a single subject, may involve less independent student inquiry and may not involve the creation of an end-product and its presentation to an audience, as opposed to Project-Based Learning, which is always multi-disciplinary in nature and where the student makes independent decisions and creates an end-product. Project-Based Learning is sometimes abbreviated as PjBL in order to differentiate it from Problem-Based Learning (e.g. Sartika, 2022).

Project-Based Learning is most often used in science subjects and at university level, but since the second half of the 20th century it has become more widespread in secondary education and in the field of language teaching as well. Hedge (1993), for example, describes project work as one of the key concepts in language teaching. Fried-Booth (2002) not only describes the method but provides teachers with practical advice, resources and topic-based project ideas according to the age and level of the students. Project-Based Language Learning has become an independent research area and is abbreviated PBL in articles published recently.

3. Research questions

This literature review aims to answer the following research questions:

- Is Project-Based Learning effective in developing students' language skills as well as 21st century skills?
- What are the advantages and challenges of using Project-Based Learning in teaching English?

4. Previous research on Project-Based Learning

This section focuses on previous research on two different aspects of Project-Based Learning: its effectiveness in developing students' foreign language skills and creativity.

4.1. Previous research on Project-Based Language Learning

Projects have been incorporated into language education since the mid-seventies due to an increased interest in student-centered learning, autonomous learning, and collaborative learning (Hedge, 1993). Language projects are useful tools in language education since they integrate all language skills (reading, writing, speaking and listening) as well as other skills, such as problem-solving (ibid.). Fried-Booth (2002) mentions contact with authentic language as one of the advantages of using projects in the EFL classroom. She also points out that projects are especially suitable for mixed-ability groups because students can contribute to the project depending on their interests and individual talents. Bell (2010) states that PBL teaches strategies that are critical for the success of students in the 21st century and that PBL is an important

strategy for teaching students to think independently. According to her article, standardized testing proves that students engaged in PBL perform better in terms of content knowledge than traditionally educated students. However, students practising Project-Based Learning also develop skills that cannot be measured with standardized tests: through solving real-world problems they learn responsibility, independence, collaboration, creativity, and discipline. Another implication of the article is that part of the success of PBL comes from higher levels of intrinsic motivation, which is ensured by allowing students to make their own choices in the process of learning.

In recent years there have been several research projects on the different aspects of implementing PBL for teaching English. The focus of the projects was either one particular skill or overall student development through the course of the project. The research projects collected data to demonstrate how effective the application of Project-Based Learning was in the chosen class. The data reflected the attitude and opinion of the participants primarily, but in one of the projects, tests were also carried out before and after the introduction of the projects. The participants of the research were either teachers only or teachers and students together. Three of the research projects were carried out in secondary schools, while one of them was carried out at a university. The results show that both teenagers and young adults can benefit from the advantages of using project-based learning and that the findings of research carried out in secondary schools can be applied to older students as well.

Table 1 summarizes some of the topics, target groups, applied methods and data collection tools:

TABLE 1. SUMMARY OF RECENT RESEARCH ON PBL

Author	Year of Issue	Topic and Target Group	Data Collection Methods and Tools
Sartika	2022	Investigating English teachers' perceptions about the implementation of Project-Based Learning and the challenges of the implementation in secondary schools in Bengkulu City, Indonesia.	quantitative: questionnaire qualitative: interview
Latifaj	2022	Investigating secondary school English teachers' and learners' attitudes related to the use of PBL in teaching English as a foreign language in Kosovo.	quantitative: questionnaire qualitative: interview
Wang	2023	Developing junior high school students' reading ability in China	quantitative: pre-test, post-test, questionnaires qualitative: observation, interviews
Rahardi et al.	2023	Developing English-major undergraduate students' writing skills in a state university in Central Java, Indonesia	quantitative: questionnaire with close-ended questions qualitative: questionnaire with open-ended questions

Source: Author's own compilation

In Sartika's 2022 research the focus was on teachers' perceptions and challenges during the implementation of the projects. The participants were thirty secondary school teachers of English in the city of Bengkulu, who adopted Project-Based Learning. They were selected based on their experience in using PBL in the classroom. In the first phase, a questionnaire was used. It contained 17 close-ended questions, eight of them were related to internal factors, five of them to external factors and four items were related to the teachers' challenges. The respondents indicated to what extent they agreed with the statements on a four-point Likert-scale (Strongly Agree – Agree – Disagree – Strongly Disagree). In the second phase the researcher interviewed the teachers to determine problems in the adoption of PBL and also to clarify questionnaire responses. The responses were categorized and analyzed. Results showed that teachers had a positive perception of using PBL in teaching English both in terms of internal and external factors. Challenges teachers had to face included insufficient knowledge regarding the implementation of projects and limited time to implement all the steps of the project. A third difficulty that was mentioned was the unstable internet network during the COVID-19 pandemic.

The objectives of the study Latifaj (2022) carried out were 'to identify teachers' and students' attitudes towards the use of PBL, to identify the benefits and challenges teachers face when implementing PBL and to make recommendations for further research'. He also studied how PBL increased students' motivation. The participants were sixty pre-university English language students of three private studios and five English teachers. The researcher interviewed the teachers and collected data from students using a Likert scale questionnaire containing twenty questions. The students came from lower secondary schools, 21 of them had previous background of learning through projects, 39 of them did not. The questions were related to previous experience, therefore only 21 students were able to complete it. The students' responses were presented in different tables. Results showed that students' overall attitude to projects was positive. What most students valued was engagement, exploring topics of interest and the opportunity to present the findings to an audience. They also agreed that all four of their language skills improved while using PBL. The teachers' interview results were only partly presented in the paper, the author produced some examples from the interviews. The most important findings from these were that PBL is of great importance in teaching English, however it requires a lot of work to plan and implement projects, therefore there should be a special training for the teachers to understand PBL better.

Wang (2023) chose the development of reading skills in the implementation of PBL as the focus of the research because most teachers emphasize speaking and listening skills while implementing projects. The participants in the experiment were 110 students, 60 of whom adopted PBL methodology and 50 were taught using traditional methodology. The main source of data collection were tests: students were given a reading comprehension test before and after the experiment. The article does not mention any pilot tests, which makes the validity of the results questionable to some extent. Also, the tests are not attached in the Appendix, which makes reproduction of the research difficult. In the experiment, the results of the pre-test and post-test were analyzed using SPSS using the independent sample T-test and the paired sample T-test result to analyze the data. These tests were carried out to determine whether the difference between the results of the two groups was significant. The average score of the two classes before the experiment was not significantly different. After a 12-week period the results of the experimental group showed significant improvement, while the results of the control group

showed very little improvement. In addition to the pre- and post-tests, data was also collected from classroom observation and was analyzed to determine the value of PBL.

Rahardi et al. (2022) aimed to find out students' opinion about the use of Project-Based Learning in an academic writing course and its effect on the development of their English language skills and 21st century skills. Based on their findings, the authors also aimed to provide teachers with adequate knowledge on how to develop students' English language skills as well as their 21st century skills using Project-Based Learning.

The research was conducted in a university of Central Java, Indonesia, with the participation of 40 randomly selected students. Data were collected using a questionnaire, which was divided into three sections. The first section asked questions related to the role of Project-Based Learning in developing students' English language skills, the second section asked questions about the role of Project-Based Learning in developing 21st century skills and the third section asked questions related to the implementation of Project-Based Learning. A statistical analysis of the data collected was carried out. After that students' perceptions were sorted into categories and were presented and interpreted using descriptive analysis. In addition to the questionnaire, data were also collected through direct observation to complement the data analysis and to learn more about the circumstances.

As for the development of English language skills, the analysis of the results revealed that most students felt that while their writing and reading skills developed significantly, very few participants thought that their speaking skills developed, and none of the students felt that their listening skills developed. All the observed 21st century skills (problem-solving, critical thinking, technological literacy, communication, cooperation and decision-making) received positive responses in the questionnaire, meaning that the participants felt that these skills developed during the implementation of the project. Two of these skills (problem-solving and critical thinking) were considered to have developed by the majority of the students, while only about half of the students thought that communication, cooperation and decision-making developed in the process. More than half of the students expressed their overall satisfaction regarding the success of the implementation of Project-Based Learning. 17 students, however, gave their perceptions on the shortcomings of the implementation of PBL.

Based on the collected data, researchers found that PBL is suitable for developing English language skills. They also provided teachers with some pedagogical implications: teachers should not focus on one or a few skills while implementing PBL, they should be able to choose activities that increase student motivation, they should consider giving students enough time to work on their projects according to the difficulty of the assignment and the condition the students are in, as well as provide sufficient explanation of the material.

According to the latest research, some of the challenges mentioned by students and teachers in the experiments can be addressed by using AI in planning and implementing school projects. While Ruiz Viruel et al. (2025) primarily focus on the increased effectiveness of AI-assisted projects in the classroom, they also mention that AI tools can be used to give immediate, personalized feedback to students, which not only increases student motivation but also saves time for the teacher. In the same research, AI was used to prepare lesson plans, which also saves time for the teachers.

4.2. Previous research on the effectiveness of Project-Based Learning in developing creativity

Although the primary focus of research was on the development of specific language skills, all the above-mentioned papers dealt with the development of some 21st century skills as well (e.g. social skills, higher-order thinking skills, creative skills, self-learning skills etc.). The researchers used qualitative methods to collect and analyze relevant data (interviews, open-ended questions) and the data was typically the opinion or attitude of the participants to their skills development. Yuan (2024), on the other hand, applied two different techniques to assess creativity in a controlled experiment: Consensus Assessment Technique (CAT) proposed by Amabile, 1996 to assess students' writing creativity and the Runco Creativity Assessment Battery (rCAB) (Okuda, Runco, & Berger, 1991) to assess students' creative solutions to real world problems. In order to assess students' writing creativity, three experienced Chinese language teachers evaluated students' stories. First, they scored the compositions independently then the average of their evaluations was calculated as the final score. The students' solutions to Runco's real world problems were evaluated based on three dimensions: fluency, flexibility and novelty. Fluency referred to the number of different solutions, flexibility to the different types of solutions and novelty was calculated by computing how frequent the different solutions were in the example. The comparison of the results of the experimental group and the control group showed that using PBL in the classroom effectively develops both types of creativity.

5. Long-term projects for developing 21st century skills using PBL

Language learning does not necessarily have to be the focus of projects to facilitate language learning. In real life, language is a tool that we use to communicate our thoughts and if education would like to imitate life, it is best if the language is a tool in the projects as well. In the following long-term projects, which were implemented in the English classroom, the English language was a tool and the focus of the projects was either developing critical thinking, cooperation and digital skills or widening the scope of students' knowledge about culture and European citizenship.

5.1. Gen-Z project: Critical thinking in action

A group of institutions, including Kürt Alternatív Gimnázium in Budapest, set out to raise students' awareness of the different types of information disorder (Wardle & Derakhshan, 2017) and teach them how to recognize and take genuine action against them. The language of the project was English. The project was coordinated by Fundacio Llor and lasted for two years between 2021 and 2023. Two fact-checking companies also participated in the project: Spanish Asociacio Verificat and Italian Pagella Politica. It is quite common for both companies to work with school students, they consider it their mission to teach them about fake news. The classroom project was carried out in five secondary schools from five different countries. The participants of the project were 300 secondary school students from five countries.

The classroom project included a theoretical phase, when students learned about the different types of information disorder. Then students created their own collection of fake news articles, which demonstrated the different types. Looking at the social media sites they used, and the posts people shared on them, they collected a series of articles and posts they believed contained

false information. In order to assess the credibility of the information, they used a tool (a form they had to complete while reading the articles and posts).

They had to

- think (and write) about their first impressions about the post or article,
- check if the author was real, find information about the author and the organization behind them,
- analyze the language of the article / post to see if there was anything suspicious about it as well as the pictures to see if they were genuine and
- check the date of issue – which is also an important piece of information regarding posts / articles.

This way students were not only collecting articles and posts but also checking their credibility.

Students learnt the technique used by fact-checkers: lateral reading, whereby whenever they find a piece of information that needs to be checked, they open a new tab on their browser (Wineburg & McGrew, 2018).

The last phase of the project was the creative phase, when students created TikTok videos, debunking fake news. To help and direct the process of creating the videos, they used a script template. The videos were then uploaded to the account of one of the fact-checking companies and this way they became public.

5.2 Check & Design project: cultural awareness, digital skills and collaboration

Under the coordination of Università Cattolica del Sacro Cuore (Milan), five secondary schools from European countries participated in a project whose main goal was to develop students' digital skills and cooperation. The participants of the project were 300 secondary school students. They created a digital textbook demonstrating the cultural activities that students can take part in their city. The cities where the schools are situated are EUROCITIES or are near one of the EUROCITIES. This way the students were also acquainted with the operation of these institutions of the European Union. The digital textbook was created using an online application (the Social Books Creator - <https://cooperative-press.eu/>). Using the application, students can work on the same book at the same time, but they can only work on different chapters simultaneously – the creation requires real collaboration from the students. Another peculiarity of the application is that it was developed for students with learning difficulties, which makes it an even more widely usable tool.

6. Conclusion

Based on the reviewed articles, it can be said that Project-Based Learning may be an effective method in teaching English to young adults (upper secondary school students and university students were involved in the projects). In fact, it can be even more effective in their case than with younger students, due to their higher inner motivation and better social skills. It is also more frequently used in educating this age group. The greatest merits of PBL methodology are the use of authentic language and the fact that students can engage in studying topics according to their choices and interests. If possible, projects should be carried out in an international environment, where the participants are forced to use English as the common language they share. This way all the four language skills (reading, listening, speaking and writing) can be

developed using PBL as the method of instruction, and it may be more effective than using traditional methods. Research suggests that it could be more effective to develop all language skills and not focus on one or two of them during the implementation process. In addition to developing language skills, PBL is also a useful tool in developing a lot of other skills, for example collaboration, oral and written communication, creativity, critical thinking and problem-solving. The development of these skills is difficult to measure, but if the teachers make sure the students complete the tasks according to the schedule, development is inevitable. Measuring the direct impact of project work on language skill development is complex due to multiple influencing factors, such as learner motivation and assessment methods, but it is evident that using the language for real life purposes contributes to the development of students' language skills as well.

Some of the challenges in implementing PBL are low student motivation, lack of time to prepare and implement the projects and lack of professional training for teachers, which results in inadequate knowledge of the topic. Student motivation and time-management can be enhanced by using AI tools in the preparation, implementation and assessment phase of the projects alike.

Based on the reviewed literature, Project-Based Learning seems to be a method that is effective in language teaching and is worth experimenting with in the EFL classroom despite the challenges it may bring. However, several areas remain unexplored. For example, researchers have not focused on the long-term educational effects of skills development. It remains unclear whether the high level of skills is retained over time. Also, recent research has not explored if PBL is equally useful for speakers of different language levels. Further research is needed in these areas. However, effectively developing language skills and 21st century skills, Project-Based Learning can contribute to developing flexible skills needed for the workforce of the future that may have to tackle jobs we do not even know at present.

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Data Availability

Data supporting the conclusions of this study can be made available upon reasonable request from the corresponding author.

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Developing University Students' Transferable Skills Through Object-Based and Collaborative Learning: An Exploration into the Role of Art Galleries and Museums

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Abstract

This empirical paper reports on the findings of a pilot study that aimed to explore student attitudes towards the innovative use of the arts to develop university students' transferable skills. Postgraduate business and management students were taken to a local museum and nearby art gallery to undertake a guided object-based learning activity. The art centre activities were designed to help students to learn, practice and develop key transferable skills through collaboration in an experiential learning setting. Methods: A questionnaire was dispersed to the students after the second trip had taken place, to ascertain student feedback on both their experience and skill development because of the object-based learning approach. Results: Of the 21 students who took part in the museum and art gallery trips, a total of 19 completed the questionnaire. The results show that the students found their visits to the museum and art gallery to be valuable, enjoyable, and social, while also gaining new skills. The quantitative and qualitative analysis supports that these experiences were especially effective in fostering discussions among students, promoting critical thinking through object-based learning, and allowing students to compare their perspectives with those of their peers. This study supports the use of informal learning environments like museums and galleries as they can be highly effective in complementing traditional classroom education by encouraging deeper engagement and support a shift toward more interactive, discussion-driven education. This deeper learning approach fosters critical thinking, cultural competence, and teamwork, thus simulates key skills employers seek in the workplace.

Keywords/key phrases: postgraduate skills, object-based learning, experiential learning, museum, art gallery

1. Introduction

Cultivating a diverse set of transferable skills during university is crucial for students' continuous learning and preparation for future career success (Scheuring & Thompson, 2024). Transferable skills, also known as soft skills, employability skills, personal skills, and generic skills (Scott & Willison, 2021), refer to a set of valuable competencies and attributes that can be applied to various environments and across different contexts (Olesen et al., 2021). Transferable skills encompass a range of competencies such as teamwork, leadership, problem-solving, critical thinking,

communication and cultural competence. These skills are essential not only for academic success but for the workplace, significantly enhancing students' propensity to secure and succeed in employment, given growing employer demands (Wahab et al., 2025).

In terms of a skills hierarchy, Tight (2020), in their systematic review of the graduate skills literature, found that there is no uniform agreement on what the most critical graduate skills are. Whilst perspectives differed between stakeholder groups and countries, some skills are frequently cited in the literature, including: communication and interpersonal skills, critical thinking, cultural awareness, teamwork and collaboration skills (Tight, 2020; Silber-Varod et al., 2019; van Laar et al., 2017). Manpower Group (2024), however, from their research were able to list the top 5 transferable skills sought by employers globally. These are: 1. collaboration and teamwork; 2. accountability and reliability; 3. Reasoning and problem solving; 4. Active learning and curiosity; 5. Resilience and adaptability. The list of skills desired evolves over time, incorporating emerging competencies relevant to today's workplace. These include cultural competence for diverse work environments (Mahayosnand & Sabra, 2024) and adaptability to new technologies in the fourth industrial revolution (Sirayi et al., 2024).

However, the Manpower Group (2024) research also showed that 75% of organisations globally report that they struggle to recruit employees with the skills their businesses need. Tushar & Sooraksa (2023) highlight that the university plays a crucial role in developing students' transferable skills, however, these authors also explore outdated university programs which do not always meet labour market expectations. This university-industry misalignment can then contribute towards the global skills gap recently reported by Manpower Group (2024).

1.1. The Value of The Arts for Skill Development

For universities to remain current in developing a variety of transferable skills that will benefit both the individual student and future business needs, academic programmes must look towards innovative ways to engender meaningful and contemporary skill-developing opportunities for their students. Carlucci & Schiuma (2018) surmise that the arts can be used to address the challenges of the modern business landscape, which require more creativity, person-centred approaches and emotional intelligence skills and capabilities. The authors explain that as the contemporary business environment demands new competencies and adaptability due to its complexity and constant change, the use of the arts offers great potential to both employees and students in developing key skills that align to current business needs.

Expanding further on how the arts can support learning, Chatterjee (2011) details how the collections in museums and art galleries can be used to enhance both subject-specific knowledge and develop key transferable skills, through the method of object-based learning (OBL). OBL in museum contexts utilises museum collections, which comprise of diverse artifacts and specimens, to offer unique opportunities for critical discussion, group work, and lateral thinking. As such, museum and art gallery collections can play a crucial role in inspiring and educating students, helping them to develop a broad range of transferable skills (Chatterjee, 2011; Das, 2015).

To summarise therefore, Chatterjee (2011) and Carlucci & Schiuma (2018), identified a set of skills which can be developed using the arts, that enable individuals to generate innovative ideas, understand and manage emotions, adjust to varying situations, engage in thoughtful dialogue, collaborate effectively, communicate information clearly, and approach problems

from new perspectives. Collectively, these competencies are essential for both personal and professional growth, enhancing one's ability to navigate and succeed in diverse environments. However, whilst the integration of the arts to support learning in various disciplines is not a new phenomenon (Kaimal et al., 2016), the arts remain underutilised as a method to enhance learning specifically in business education (Molderez & Ceulemans, 2018). This is echoed by Decker-Lange (2018), who in their critique of business schools, stress that profit-driven private sector organisations are the dominant focus, and other contexts, such as the arts, can often be omitted from business and management curriculum, either as company case studies for students to analyse, or as places for student learning and skill development.

Where business and management programmes have drawn upon the arts to develop transferable skills in their students, there have been positive outcomes. In their study, Molderez & Ceulemans (2018) found that using paintings as part of a corporate social responsibility course for postgraduate management students, was a helpful way for the students to see different points of view on complex sustainability topics. These authors used a selection of artwork which they showed in class, to provoke reflection and stimulate discussion amongst students about sustainability concepts. The findings showed that this approach helped students to consider topics from different viewpoints and enhanced their grasp of complex sustainability concepts.

In their study involving executive learners, Kaimal et al. (2016) took managers to an art museum as part of their leadership development training, encouraging them to explore and discuss their perceptions of, and reactions to, various art. The researchers found that engagement with the artefacts through the museum experience helped to enhance self-awareness as well as awareness of others' too. This intrapersonal and interpersonal skill development enriched the participants' appreciation of themselves whilst stressing the importance of being 'open-minded' to the different perspectives. These are key skills within management roles (Kaimal et al., 2016).

In the context of economics education, Das (2015) reports on their study which required students to visit two museum exhibits as part of their economics classes. The two exhibits aligned to key economics concepts, including decision-making, wealth inequality, market dynamics, property rights, innovation and productivity. The exhibits provided a way to connect economics topics with societal themes in an experiential learning context. Student surveys revealed that incorporating museum visits into the economics curriculum greatly enhanced their learning. The visits allowed students to engage with rich and diverse exhibits, which provided a tangible context for exploring significant issues such as labour market discrimination and the history of patent institutions. Students commented that this connection between real-world social and institutional challenges and the theoretical and empirical frameworks of economics deepened their understanding of the subject. This paper focused mainly on subject-specific knowledge, but the findings did also report some skill development, aligning to communication skills by encouraging thoughtful interdisciplinary discussions about history, culture, and broader societal perspectives (Das, 2015).

These above research projects demonstrate how the arts can be instrumental in management education for developing transferable skills. For example, group discussions centred on individual art pieces can help students understand varying interpretations and viewpoints. Additionally, by listening to the rationale behind others' interpretations of specific artworks, students can refine their initial perspectives and expand their understanding. Communication and cultural awareness are crucial for diverse workforces, where individuals possess varied

perspectives based on different cultural, professional, and lived experiences. Managers and leaders must be respectful and sensitive to differing viewpoints within their teams, and adept at navigating and appreciating these differences successfully. As such, the use of the arts (either through the inclusion of artwork pieces, or via trips to museums) is a valuable way to develop key skills in business and management students.

1.2. Learning Approach

The integration of the arts into university management education has drawn from three key learning approaches: object-based learning (Chatterjee, 2011), experiential learning (Das, 2015), and collaborative learning (Kaimal et al., 2016). Firstly, object-based learning (OBL) engages students by using physical objects or artifacts as a focus for exploration and understanding. By directly observing and interacting with materials such as museum exhibits, historical artifacts, or paintings, students develop new thinking through critical thinking and enhanced observational skills (Chatterjee & Hannan, 2016). This hands-on approach fosters multidimensional perspectives, enriches the educational experience, and makes learning more dynamic and impactful (Chatterjee & Hannan, 2016). Secondly, experiential learning focuses on acquiring knowledge through direct experience and reflection. Students engage in real-world activities such as fieldtrips, simulations, or hands-on experiments, bridging the gap between theory and practice. This approach deepens understanding, develops practical skills, and encourages a cycle of critical thinking through active participation and subsequent reflective practice (Kolb & Kolb, 2017). Finally, collaborative learning involves interaction and cooperation amongst students (Qureshi et al., 2021). By participating in group activities, discussions, and collaborative problem-solving tasks, students share ideas, debate perspectives, and build collective understanding. This approach fosters teamwork, enhances communication skills, and promotes a deeper grasp of concepts through shared effort and diverse viewpoints, as Chatterjee & Hannan, (2016; 3) explain: “*deeper cognitive engagement can be brought about when learning is more social*”. As such, learning collaboratively with others improves students' academic performance by fostering deeper understanding, engagement, and idea-sharing (Qureshi et al., 2021).

These three approaches, which all have areas of overlap with each other, demonstrate the transformative potential of the arts in creating engaging, multidimensional learning experiences through a combination of object-based learning, experiential learning and collaborative learning. As this study involved taking students to a museum and art gallery, this qualifies as experiential learning, using museum exhibits and artefacts qualifies for OBL and the real-time and post-activity group discussions incorporated into the student tasks, also permits this as a collaborative learning approach too. As such, this project incorporated elements from each of these learning styles to maximise the experience for the students and deepen the learning.

1.3. Research Aim

Only a few studies exist in the field of the use of museums and art galleries in business and management education for the development of transferable skills (Molderez & Ceulemans, 2018), as such, this project took an exploratory approach to build on the work of other researchers on this topic.

This paper reports on the findings from this quantitative pilot study, exploring postgraduate management students' skill development through tailored activities involving object-based and

collaborative learning via experiential learning set in a museum and art gallery visit. The project research question is: How do postgraduate students experience object-based and collaborative learning activities set in art gallery and museum environments and what impact does this have on their skill development?

2. Methods

This study adopted a quantitative research design, utilising a questionnaire approach with postgraduate management students who had attended either one or both available guided museum and art gallery trips over a 2-week period.

2.1. The Sample and Object-Based Learning Approach

The project involved 21 postgraduate students enrolled on one of the University's Master's in Management programmes. The students reside within in the Business School of a University based within the North-West of England. During the first two weeks of the Master's course, these 21 students attended either one or both of the two Object-Based Learning guided activities within local art centres. In week one, there was a trip to a local museum and in week 2 there was a trip to an art gallery. The two art centres were within walking distance to the University. These trips were part of the suite of activities planned for the MSc students during the 2-week induction period to their course, and as such, were not credit-bearing and not linked to any future assessment. A summary of the two art centre activities is provided in Table 1 below but for more details of what each art centre exercise involved, please see the supplementary information.

TABLE 1. STRUCTURED ACTIVITIES FOR EACH OF THE MUSEUM AND ART GALLERY VISITS

Guided Museum Activity Week 1 of MSc course	Guided Art Gallery Activity Week 2 of MSc course
Students spend 15 minutes silently observing an assigned artwork or object to enhance their observational skills. Individually, they consider different interpretations and develop critical thinking by asking questions like "What am I seeing that someone else might see differently?" and exploring the reasons behind their observations. Following the individual reflection, students then engage in group discussions to share their insights, explore different viewpoints, and discuss broader issues such as bias and inequality. This activity aims to refine their communication and critical thinking skills while fostering an appreciation for diverse perspectives.	Students worked in pairs or small groups, choosing specific paintings or artwork that sparked their interest. Students collectively observed the art piece and took notes on their observations, focusing on individual interpretations, details noticed, the artist's intended message, and questions they had about the artwork. Group discussions throughout the visit, allowed students to explore and compare reactions and perspectives, fostering collaborative learning and cementing transferable skills through diverse interpretations and shared experiences.

Source: own construction

As depicted in Table 1, the activities were designed to facilitate group work and group discussions by working through guided worksheet exercises. The guided worksheet activities aimed to develop specific skills, which included: observational skills for reviewing unfamiliar art pieces, communication skills in talking to others about what they see, encouraging debate

around diverse viewpoints and practicing critical thinking skills by asking ‘why’ and ‘how’ questions about the objects.

Pairs and small groups were self-selecting, so students chose who to work with, however, as these museum and art gallery trips were in the induction period, i.e., the first two weeks of the course, most students did not know each other, so held discussions with peers they had only just met. Furthermore, the MSc student cohort is diverse, representing many different countries from around the world, each having differing cultural, work, and life experiences. This helped to provide further richness to the discussions and aid in sharing of diverse opinions and perspectives.

2.2. The Questionnaire

As this was an exploratory project, the questionnaire was designed to garner participant attitudes towards the experience and insights on the skills developed. Section 1 of the questionnaire contained questions pertaining to demographic data, whilst maintaining participant anonymity. This study wanted to ascertain how the postgraduate Management students experienced the art centre trips and gain their perspective on this being a valuable learning experience. As such, section 2 of the questionnaire focused specifically on the respondents’ experience of this method of learning. The questions contained within section 2 derive from Chatterjee’s (2011) work exploring students’ engagement with art centres as a strategy for learning, as well as drawing from Kolb & Kolb (2017) asking students opinions of the experiential learning aspect, which is more practical and hands-on than traditional classroom experiences. This section 2 contained a 5-point Likert scale ranging from “strongly disagree” to “strongly agree” for 8 statements relating to the overall museum and art gallery learning experience. One open-ended question was included here for participants to expand on their overall learning experience.

Section 3 of the questionnaire then focused on a list of specific skills that students felt they had the opportunity to develop through this initiative. The list of 10 skills used in section 3, were drawn from the findings of the previous studies in this area; critical thinking and observational skills (Tight, 2020; Chatterjee & Hannan, 2016); reflective practice (Kolb & Kolb, 2017); communication and collaboration (Qureshi et al., 2021; Tight, 2020); awareness and appreciation of different viewpoints (Molderez & Ceulemans, 2018; van Laar et al., 2017; Kaimal et al., 2016; Mahayosnand & Sabra, 2024).

In this final section of the questionnaire, again a 5-point Likert scale was included for these statements relating to any skill developments gained from the experience, and a final open-ended question for participants to comment on their specific skills developed from the art centre visits.

In summary, the statements included in sections 2 and 3 of the questionnaire were developed through the explored literature and based upon the key concepts of object-based learning, collaborative learning, and experiential learning theory, as well as drawing on the findings from the previous studies that exist in this field.

2.3. Ethical Approval

At the start of this research project, the author submitted a proposal outlining the study's aims, methods, participant recruitment approach, data handling, and potential risks to the University’s Research Ethics Committee. This was considered a minimal risk project, and ethical approval was granted on 16.09.2024 with the Ethics Reference No: 24/LBS/032.

2.4. The Analysis

For the quantitative data collected from the questionnaire, the data was entered into SPSS for analysis. As the number of participants was small, this limited the statistical tests that could be performed. As such, the quantitative data was analysed descriptively, i.e., producing means, percentages and standard deviations. Descriptive statistics can provide a useful summary of the data and allows for the reporting of trends and patterns in the data (Acosta & Brooks, 2021).

For the qualitative data obtained through the two open-ended questions within the questionnaire, this was analysed using Braun & Clarkes (2006) stepped approach to Thematic Analysis. Braun & Clark (2006) define two levels of thematic analysis: semantic and latent. Semantic thematic analysis involves identifying and analysing themes that are explicitly stated by participants or found directly in the literature. This level focuses on the surface meaning of the data, highlighting what is directly communicated. In contrast, latent thematic analysis goes beyond the explicit content to uncover underlying themes. Researchers look beyond what is directly said, inferring deeper patterns and meanings that are not immediately apparent. This level of analysis seeks to interpret and understand the underlying assumptions, ideas, and ideologies within the data. This analysis drew on both approaches (semantic and latent) to create a set of themes to summarise the qualitative data.

3. Results

The cohort of students was small; only 21 students attended the museum and art gallery trips. Of these 21 students, 19 completed the follow-up questionnaire. So, although the questionnaire response rate was high (90%) overall, the sample size is very small and this therefore limits the analysis that can be performed on the data. However, this is a pilot study and exploratory in nature, with an aim to gain insights and identify preliminary trends in the use of the arts for developing university students' transferable skills.

3.1. Demographic Data

The sample comprised of 19 postgraduate students with a mean age of 27.7 years. In terms of gender split, 53% reported as male and 47% reported as female. Most of the students (84%) were classed as international students and the remaining 16% classified as home students. Of the two trips available, 74% of the sample had attended both the museum and art gallery venues, with the remaining 26% only attending one trip (either the museum or the art gallery).

3.2. Quantitative Analysis

The questionnaire largely contained Likert scale statements which yielded quantitative data about two key areas; 1. the students' overall learning experience of the museum and art gallery visits and 2. Any specific skills developed through the experience. The responses are based on a 5-point Likert scale, with higher values (5) indicating stronger agreement and lower values (1) indicating stronger disagreement. The mean scores for each statement are presented in Table 1 and Table 2 below. Wanjohi & Syokau (2021) suggest the following mean score interpretations: 1.0-2.4 represent a negative attitude, 2.5-3.4 are considered neutral attitudes whilst mean scores in the bracket 3.5-5.0 represent positive attitudes. I.e., the higher the mean score, the higher the agreement expressed by the respondents. The standard deviation scores are also given in the tables below, which are a measure of how spread out the values are in a dataset.

Table 2 shows the mean scores and standard deviations for all the statements contained within section 2 of the questionnaire pertaining to the overall learning experience.

TABLE 2. STUDENTS' OVERALL VISIT EXPERIENCE

	N	Minimum	Maximum	Mean	Std. Deviation
The experience was engaging	19	4.00	5.00	4.6842	.47757
I got to know students better on the trip	19	3.00	5.00	4.4737	.69669
I liked that the session was outside of the classroom	19	2.00	5.00	4.6316	.76089
Its more effective learning than inside classroom	19	2.00	5.00	4.4737	.96427
Enjoyed interacting with fellow students	19	3.00	5.00	4.5789	.60698
The trip generated innovative discussions	19	3.00	5.00	4.6316	.68399
Acquire skills through hands-on experience	19	3.00	5.00	4.2632	.73349
I have learnt something new	19	4.00	5.00	4.7368	.45241

Source: own calculations

All mean scores in Table 2 show very strong agreement to the statement with the highest mean score for the statement 'I have learnt something new'. The second highest mean was for the statements: 'The experience was engaging' and in joint third place were: 'I liked that the session was outside of the classroom' and 'The trip generated innovative discussions'. Additionally, the Standard Deviation scores all are under the value of 1. This means they all are low standard deviation scores, suggesting that the data points are closer to the mean, indicating a low variance and more consistency. Overall, the data in Table 2 suggests that student found the visits to the museum and art gallery beneficial, enjoyable and social, whilst primarily learning something new. However, the statement 'It's more effective learning than inside the classroom' yielded the highest Standard Deviation score (.96427) which indicates the responses had the highest variance from the mean and therefore more inconsistency in the student scores.

Table 3 below provides all the mean scores relating to the skills statement contained within section 3 of the questionnaire. These statements all yielded positive attitudes (all above 4.36) and they all exhibited low standard deviation scores, indicating low variance from the mean and more consistency between responses.

TABLE 3. SKILLS DEVELOPED THROUGH THE EXPERIENCE

	N	Minimum	Maximum	Mean	Std. Deviation
I gained insights on how my opinions compared to others	19	4.00	5.00	4.5789	.50726
Practiced using my observational skills	19	3.00	5.00	4.5263	.61178
I was able to discuss with others	19	3.00	5.00	4.6316	.59726
I was able to think critically about an object	19	3.00	5.00	4.7368	.56195
Was able to take my time and not jump to conclusions	19	3.00	5.00	4.5263	.69669
I collaborated with other students in a team	19	3.00	5.00	4.4211	.69248
Developed my thinking skills in a practical way	19	3.00	5.00	4.4737	.69669
My communication skills were enhanced	19	3.00	5.00	4.5263	.69669
I became more appreciative of diverse viewpoints	19	3.00	5.00	4.5263	.69669
I was able to reflect on my learning	19	2.00	5.00	4.3684	.83070
I would like more experiences like this on my PGT studies	19	2.00	5.00	4.5263	.84119

Source: own calculations

The three highest mean scores were for the statements: ‘I was able to think critically about an object’, ‘I was able to discuss with others’ and ‘I gained insights on how my opinions compared to others’. These scores support that the museum and art gallery experiences were particularly effective in encouraging discussions amongst the students, facilitated critical thinking through object-based learning and through these discussions, students had the opportunities to compare their own viewpoints with those of their teammates to explore how they aligned or differed from those of their peers. In comparison, the statement ‘I was able to reflect on my learning’ had the lowest mean and highest variability, however, this still yielded a positive mean of 4.36 and a low standard deviation score below 1.

3.3. Thematic Analysis of the Qualitative comments

The questionnaire contained two specific open-ended questions for participants to include qualitative comments. The first requested more detail on the students’ overall learning experience and reflections of the visits, whilst the second open-ended question sought examples from students regarding their skill development from undertaking the guided tasks. Thematic Analysis was performed in line with Braun & Clarkes (2006) six-step approach and from this analysis, five themes were derived from the student quotes.

3.3.1. Theme 1: Self-Awareness Skills

The quotes from the students revealed that the discussion exercises surrounding the objects helped students to reflect on how their views differed to the views of others. Some students were able to articulate the interesting difference in perspectives between students within the same group reviewing the same object:

“It was really interesting to me how I viewed the sculpture as bad with negative connotations as it was black and red, which are colours for danger, but my groupmate saw it as good. From our discussions I was able to understand their view and how based on culture, we can see things differently.” (Male home student)

“I learnt how I feel about religious artefacts, how that is shaped by my observational skills by looking at it as a whole and through the eyes of others.” (Male international student)

“I learnt that objects could reflect deeper meaning when we take a closer view and hear from different opinions and so I am not only limited to how I see things.” (Female home student)

3.3.2. Theme 2: The Importance of Diversity to Leadership

Students reported that they learnt the importance of different cultural viewpoints being considered when working on a task. The quotes support that not only did students learn from different cultures whilst working in the groups on the tasks, but they learnt the appreciation of diverse voices being heard, as that yields a better outcome and supports different ways of thinking.

“I have learnt how different cultural backgrounds and education influences how we perceive different things in life. This can enhance leadership by being sensitive to different viewpoints which fosters a better environment.” (Female international student)

“This activity has helped me to understand the different beliefs and perspectives of people towards cultures, religion and artwork. These kind of activities improve our understanding of each other, which helps us in our study and work with respecting other cultures.” (Male international student)

“The importance of diverse perspectives, especially in understanding culture and diversity, for leadership styles and decision-making, cannot be over-emphasised, because we all need each other to grow and no opinion is wrong.” (Female international student)

3.3.3. Theme 3: Learning through Collaboration

Another key area which students commented on, involved the benefits of teamworking and learning through collaboration:

“We listened to all individuals tell their own decisions on the painting, discussing with the group improved the decision of the whole group and we learnt new things from them.” (Female international student)

“This educational trip helped me to build bonds with others and get to know people on my course...got to hear different points of view and learn from each other.” (Male home student)

“The visits helped me to practice teamwork skills in the form of discussions and interactions and experience of this outside of the classroom.” (Female international student)

3.3.4. Theme 4: Engaged Learning Experience

Overall, the students welcomed the experience outside of the traditional classroom and enjoyed visiting the museum and art gallery as a student cohort. Student comments support that the experience was more than just enjoyable however, in that the enjoyment helped them to be more engaged and have a deeper learning experience as a result:

“Having a task to do is good and resulted in better reflections, critical thinking and deeper observations. If I had come to the museum alone, I would just walk round and look, but not think too deeply.” (Male home student)

“It was a wonderful and valuable experience as this exercise was both fun and knowledgeable.” (Male international student)

“These outside classroom activities helped me to develop my skills more practically and more engaging than in the classroom.” (Male international student)

3.3.5. Theme 5: Developed Key Skills

As was included in the quantitative analysis section, the students reported on a range of skills they developed. Some of the student quotes expand on the numerical data to offer further insights and reflections into the skills students practiced and developed during the museum and art gallery visits. These include: teamwork, observation, critical thinking, as well as self-confidence:

“Both the museum and art gallery visits were so exciting and engaging. I totally enjoyed this experience and learnt a lot about teamwork.” (Male international student)

“We started observing a lot on the object and got so much details and ideas about it. This activity definitely helped me to enhance my observation skills and to understand clear observation and critical thinking as necessary skills.” (Male international student)

“I think critical thinking in particular was enhanced, especially when learning others’ views.” (Male international student)

4. Discussion and Future Research

The results show that the feedback from the students about the museum and art gallery visits were overwhelmingly positive. The learning experience was enjoyable, provided opportunities to learn something new and allowed for innovative discussions within the groups. In terms of transferable skills, the students reported on a range of skills they developed from the object-based, collaborative learning that took place via the experiential experiences in the museum and art gallery. The quantitative and qualitative analysis both support the findings of previous researchers in the field on the potential of such art centres to help individuals practice and develop a number of skills through the use of the arts (Chatterjee, 2011; Das, 2015; Carlucci & Schiuma, 2018).

Many of the participant responses commented that they learnt the value of different perspectives through this exercise, which was a similar finding to Molderez & Ceulemans (2018). However, this research extends this prior work to argue that the students in this study were commenting on the development of a thorough appreciation of different opinions, ideas and diverse viewpoints. The

quotes support that the students felt a high level of respect for diverse viewpoints and several students were able to link the value of learning about different opinions to effective leadership and responsible decision-making - which is a deep insight gained from this study.

In addition to diverse thinking skills, the students cite a range of other transferable skills developed from the museum and art gallery trips. For example, the students developed several of the highly sought after skills by global recruiters, as reported by Manpower Group (2024). Collaboration and teamwork, critical reasoning and problem solving, along with active learning and curiosity, were all reportedly developed by the students from this initiative.

Not only did students develop a range of transferable skills in an experiential learning format, but this learning had wider reach through inter-connected elements. For example, students hearing diverse perspectives through the collaborative exercises, also helped students to develop their critical thinking, self-reflection, and communication skills during those object-based collaborative discussions. Meaning that the collaborative exercises exposed students to different viewpoints, prompting them to navigate and reconcile multiple perspectives. This, in turn, enhanced their ability to critically assess information, engage in meaningful self-reflection, and communicate their thoughts effectively. The skills developed over the two venue visits were therefore intertwined and as can be seen in some of the quotes above, there is some overlap when attempting to compartmentalise the quotes neatly into the five main themes. This evidences how dynamic yet complex, the learning process is, as it does not occur in isolation. Taking students outside of the classroom to engage in collaborative, experiential and object-based learning really helped to deepen student learning and understanding and following the work of Kolb & Kolb (2017), encourage a cycle of active participation, reflection and subsequent cognitive skill development. As such, not only do the findings of this study support a breadth of learning, but results of this study support the conclusions of Chatterjee & Hannan (2016) that the social side to the experience helped students to learn more deeply too. In summary, breadth and depth of skill development was evident from the museum and art gallery experiences.

This exploratory study offers deeper insights into the benefits of experiential, arts-based learning for postgraduate management students, particularly in fostering an appreciation of diverse perspectives, enhancing skill development through collaborative working and critical thinking skills. While previous research has explored object-based and collaborative learning in business and management education (Das, 2015; Kaimal et al., 2016; Molderez & Ceulemans, 2018), the arts remain underutilised as a method to enhance learning in this discipline (Molderez & Ceulemans, 2018). By demonstrating the potential of arts-based learning in business education, this study joins a small collection of existing research that challenges the conventional focus of management curricula and supports broader integration of non-traditional learning environments. This practice of arts-based learning has received little attention in the field of business and management but has potentially significant real-world implications when this learning approach yields the development of key skills that are highly sought-after by global recruiters (Manpower Group, 2024).

As this was an exploratory pilot study, there are some suggestions to make for future research. One area for improvement is to encourage more structured and explicit reflection after the student activity. This would maximise the student learning from the activities and cement the learning further. Another suggestion for future research is to undertake a longitudinal approach through qualitative means (i.e., interviews or focus groups) to explore whether the museum and art gallery

experiences, along with the skills gained through this initiative, have a lasting impact on students' academic and professional development. A final suggestion for future research is to explore the use of technology and how digital tools, virtual museum tours, or augmented reality can enhance object-based and collaborative learning and whether they yield similar benefits to in-person experiences?

5. Conclusion

This study highlights the value of object-based and collaborative learning in an experiential arts experience for developing transferable skills among postgraduate business and management students. The findings support that museums and galleries can provide an engaging and interactive environment that fosters critical thinking, self-awareness, observation, communication and collaboration skills, as well as reflective practice and an appreciation of diversity—all key skills which are essential for personal and professional success.

The results of this study also have wider implications. For example, universities could explore the integration of experiential learning into management education to enhance student engagement and skill development. These findings are also relevant to organisations seeking creative employee training through the use of arts-based learning, such as museum workshops, to enhance the appreciation of diverse perspectives, creative and critical thinking as well as teamwork. Leadership training programs specifically could apply these methods to develop these key transferrable skills which can make leaders more effective. Policymakers should also consider promoting partnerships between universities, museums, and businesses to create structured learning initiatives that connect academic knowledge with real-world application, ensuring graduates are equipped for today's complex professional landscape.

However, this study does also have some limitations. Firstly, the small sample size coupled with an exploratory research design with only one Business School, means that the findings are not generalisable, especially as this employed a non-random sample (Tipton et al., 2017). However, small scale and case study research findings can still provide valuable viewpoints, understandings and key insights into a phenomenon (Yin, 2018). Secondly, as the researcher, I acknowledge that my positionality, potential biases and assumptions have influenced the research. For example, my limited resources resulted in a preference for questionnaires, which meant that a certain richness of data through interviews or focus groups was not sought. Furthermore, while I aimed to approach the study objectively, my advocacy for innovative pedagogy may have shaped how I framed the conclusions. However, I took measures to mitigate this, employing structured data collection and analysis to enhance transparency and rigor.

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Declaration Statements

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Data Availability

Data supporting the conclusions of this study can be made available upon reasonable request from the corresponding author.

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Domestic and International Doctoral Students' Motivation to Study at Hungarian Universities: A Comparative Study

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Abstract

Hungary is a member of the European Higher Education Area (EHEA) and follows a three-cycle higher education system based on the Bologna Process. Raising the number of international and domestic PhD students improves the position of Hungarian universities in international competition for higher education. There are around ten thousand full-time doctoral students; nearly 32% are internationals in Hungary, according to the Central Statistical Office. A great number of higher education institutions develop doctoral programs to attract more domestic and international students, hence, it is significantly important to get to know about students' motivation to enrol in doctoral study in Hungary. This study was conducted in 2023 and examined international and domestic students' motivation using the two-factor model of intrinsic and extrinsic motivation proposed by the self-determination theory of human motivation. A questionnaire was administered to 100 international doctoral students, 45 males and 55 females, aged 25 to 45, and to 100 domestic doctoral students, 38 males and 62 females, aged 25 to 48 to explore the motivation to attend a Hungarian university. The results of the study show that the respondents endorsed more items on intrinsic motivation than on extrinsic motivation. There is a significant difference in motivation among domestic and international doctoral students at Hungarian universities. Domestic students demonstrate a higher level of motivation to get knowledge and a higher level of introjected regulation. International doctoral students show a higher level of amotivation compared to domestic students. The existing literature on international education is mostly focused on the skills and benefits students gain, but there has been limited research on doctoral students' motivation. At the same time, knowledge about international and domestic doctoral students' motivation can be used in program development which fits more to the motivational characteristics of doctoral students.

Keywords/key phrases: self-determination theory, motivation, doctoral students, higher education, internationalisation

1. Introduction

Increasing the number of doctoral students and the quality of the training programs is the main goal for educational policy (Tempus Public Foundation, 2022). This goal is the most common way to improve the position of Hungarian universities in the international competition of higher education. Higher education institutions are interested in raising the number of professionals who are capable of analysing highly complex social and economic phenomenon. At the same time, a larger number of doctoral students can also stimulate postgraduate training at the university and retain talented graduates at universities.

Hungarian universities raise the number not only of domestic doctoral students, but also of international students. The presence and the number of foreign students are the most visible indicators of the internationalisation of higher education. The definition of internationalization of higher education refers to the process of integrating an international aspect into the teaching, research, and service functions of internationalisation (Knight & Wit, 1997). The internationalisation of higher education can facilitate growth of science all around the world, increase the number of scholarship programs, help to build powerful academic international networks, and also stimulates the transfer of knowledge and global research (Altbach & Khight, 2007). International students not only increase the prestige of the institution but also bring additional revenue to the university and country. Active participation of doctoral students in international research projects, acquisition of patent rights, or publications of research results in international journals improve the position of Hungarian universities in the international arena and bring more recognition.

Previously conducted research on doctoral students' experience has shown that motivation plays a significant role in students' engagement in doctoral studies (Pyhältö et al., 2012). For example, doctoral students who demonstrate a lack of motivation in their studies are at the risk of perceiving their academic scholarly community more negatively than their more motivated colleagues (Stubb et al., 2011). Another study shows that a lack of motivation results in negative engagement with their studies, dissatisfaction with their working conditions, and supervisory support (Pyhältö et al., 2009). At the same time motivation plays an important role in the completion of the doctoral dissertation together with persistence factors and completion strategies (Spaulding & Rockinson-Szapkiw, 2012). Some researchers identified that motivation or lack of motivation toward PhD studies has been considered as a key component of achievement, persistence, or dropout (Bair & Haworth, 2004; Sverdlik et al., 2018).

Motivation could be certainly perceived as one of the most studied psychological concepts in education, which energises and directs behaviour toward a goal (Eggen & Kauchak, 1994). Motivation refers to any force that energises and directs behaviour in different types of activity (Reeve, 2009). This energy gives behaviour its intensity, strength, and persistence. Even so doctoral students themselves consider motivation as one of the central factors that affects their persistence in continuing their doctoral studies (Ivankova & Stick, 2006; Spaulding & Rockinson-Szapkiw, 2012) and in being able to complete their degree (Wao & Onwuegbuzie, 2011). The importance of motivation can be seen throughout enrolment into doctoral studies, working process, and completion of the doctoral dissertation.

The study aims to investigate doctoral students' motivation using the two-factor model of intrinsic and extrinsic motivation proposed by the self-determination theory (SDT; Deci & Ryan, 2008; Ryan & Deci, 2000; Vallerand, 1997) of human motivation. SDT provides a relevant theoretical background as this theory posits that different types of motivation vary as per how much a student engages in an activity for reasons of personal choice. To fulfil the aim of the study, the questionnaire "Why are you studying at Hungarian university" was created

and distributed among domestic and international students in Hungary. The data were statistically analysed by using mean, standard deviation, and pair *t*-test. The existing empirical literature on higher education mostly has focused on domestic students and their motivation to obtain higher education degrees, but there has been limited research on domestic and international doctoral student motivation (Litalien et al., 2023). At the same time, knowledge about doctoral students' motivation can be used in the program support and development to fit more to the motivational characteristics of students.

2. Literature Review

Motivation can be perceived as one of the most popular psychological constructs in education (Koenka, 2020). Motivation refers to any force that energises and directs behaviours in different types of activity (Reeve, 2009). Most of the research on academic motivation focuses on clarifying why students behave the way they do and how this affects their academic performance (Schunk et al., 2014). The most commonly cited theories focus on academic motivation, including social cognitive theory, expectancy-value theory, interest theory, attribution theory, achievement goal theory, and self-determination theory (Schunk et al., 2014). Self-determination theory (SDT) represents an empirically based motivational construct that is recommended to explain motivation among students (Chirkov et al., 2007). Self-determination theory proposes that all students, no matter what their age, gender, level of study, country of origin, or cultural context possess inherent growth tendencies (e.g., intrinsic motivation) that provide a motivational foundation for their better educational outcomes (Deci & Ryan, 1985; Vansteenkiste, 2006).

Based on Deci and Ryan's intrinsic and extrinsic motivation, SDT has been developed into a motivation continuum to assess the degree to which an individual's behaviour is performed autonomously versus being controlled externally (Deci & Ryan, 2008). Autonomous motivation has two sub-categories: intrinsic motivation and internalised extrinsic motivation or identified motivation. Intrinsic motivation represents a prototype of autonomous motivation, and is characterised by an individual engaging in a specific task simply because of personal interest in it. Internalised extrinsic motivation or identified motivation is a type of extrinsic motivation in nature but has been internalised or regulated into a self-willing belief (Chirkov et al., 2007). Controlled motivation also has two sub-categories: extrinsic and introjected regulation. Extrinsic regulation represents the individual's behaviour which is motivated by external rewards or avoiding punishment. In case of introjected regulation, the person is apt to implement the behaviour to avoid feelings of shame or guilt or to meet the expectations of others. When a student executes an activity with controlled regulation, he or she is motivated by external factors.

Intrinsic motivation generally attributes the motivation to engage in an activity because that activity is satisfying and enjoyable to do. Intrinsic motivation is founded upon innate needs for competence and self-determination. Further, Vallerand and his colleagues (Vallerand, 1997; Vallerand et al., 1989; Vallerand et al., 1992) proposed a three-part taxonomy of intrinsic motivation. The first type of intrinsic motivation is knowledge, which refers to the motivation for doing an activity for the feelings associated with developing knowledge and exploring new ideas. In this situation, doctoral students experience the pleasure of studying at Hungarian universities and getting knowledge in the particular field of study. The second type is accomplishment, which refers to the sensations related to attempting to achieve a goal or master a task. Doctoral students feel the satisfaction of passing examinations, publishing articles, and participating in research projects. The third type is stimulation, which relates to motivation based simply on the sensations stimulated by performing the task, such as aesthetic appreciation or fun and excitement. For example, doctoral students express joy when discussing their research topic with other students and professors. The common

basis of these three subtypes is the pleasurable sensations experienced during the self-initiated and reasonably challenging activity.

In contrast to intrinsically motivated behaviours, extrinsically motivated behaviours represent actions which are carried out to achieve some instrumental goals, such as earning a reward or avoiding punishment. This type of motivation does not necessarily mean a lack of self-determination in the behaviours performed. Rather, different types of extrinsic motivation can be classified along a continuum according to the extent to which they are internalised into the self-concept as a part of self-determination (Deci & Ryan, 1985; Vallerand, 1997). Three levels of extrinsic motivation have been differentiated (Vallerand et al., 1989; Vallerand et al., 1992; Vallerand, 1997). From the lowest to the highest level of self-determination, there are external regulation, introjected regulation, and identified regulation.

External regulation represents those activities that are determined by sources external to the person, such as the costs of the study program, the opportunity to get a scholarship, receiving internationally recognised certificates of higher education or title, career prospects, and other tangible benefits. If the reason for doctoral studying at a Hungarian university is taken away, there is no intention to continue the engagement in this process. The second type of extrinsic motivation which is more internalised into the self-concept is introjected regulation. Introjected regulation refers to reasons that pertain to performing an activity due to some type of pressure that individuals have incorporated into the self, such that they compel themselves to carry out that activity. Although the source of the pressure is internal, it is not self-determined because the people are reacting to pressure, not acting based on personal choice. An example of this type of regulation is when students embark upon doctoral study because they have been pressured into it by family or professors. The most self-determined form of extrinsic motivation is identified regulation. At this point, individuals invest energy in an activity because they have chosen to do so for personally relevant reasons. For instance, students who feel that pursuing a doctorate degree at a Hungarian university is an important aspect of their professional development.

All types of intrinsic and extrinsic motivations are contrasted with amotivation (Deci & Ryan, 2000). Intrinsic and extrinsic motivation both imply the existence of intention that drives behaviours towards the goals, whereas the lack of such intention is represented by the concept of amotivation. Amotivation refers to the situation in which students see no relation between their actions and the consequences of those actions; the consequences are seen as arising as a result of factors beyond their control. These students demonstrate the lack of self-motivation, display disaffection, and can act irresponsibly. A lack of competence, control, or value can lead to amotivation (Ryan & Deci, 2000).

Empirical literature regarding SDT in the field of education has shown that a higher level of self-determination leads to positive educational outcomes, i.e. deeper engagement, better conceptual learning, and higher persistence (Areepattamannil et al., 2011; Black & Deci, 2000; Lin et al., 2003; Moneta & Siu, 2002; Pelletier et al., 2001; Standage et al., 2003; Vansteenkiste et al., 2006; Zhou et al., 2009; Zhu & Leung, 2011). This educational outcome can be considered as important for doctoral students who meet a lot of challenges during their studying in the long term. Hence more self-determined students have more positive educational outcomes in skills and knowledge that they can apply in their future study and career. To develop a higher sense of self-determination towards intrinsic motivation, an individual's basic psychological needs of autonomy, competence and relatedness must be satisfied (Deci et al., 1991).

The three basic psychological needs of autonomy, competence, and relatedness are the source of students' inherent and proactive intrinsically motivated tendency to seek out novelty, be more active and persistent, pursue the optimal challenge, exercise their capabilities, explore, and learn. As a

consequence, the high sense of self-determination towards intrinsic motivation is connected with satisfaction of the basic psychological needs of autonomy, competence, and relatedness. It is essential to consider internal factors such as an individual's age, gender, cognitive ability, and the introduction of external social factors, including the degree of autonomy supported in the environment of the university (Wehmeyer et al., 2011). When a university environment supports a degree of autonomy to satisfy the three basic psychological needs, doctoral students' intrinsic motivation is expected to be facilitated. Students are expected to be more proactive, pursue optimal challenges, and develop professional competences. In contrast, when these needs are ignored, the individual's motivation is decreased (Ryan & Deci, 2000).

As a basic psychological need, autonomy refers to the experience of one's behaviour as voluntary, the inner endorsement. A university environment can support doctoral students' autonomy by tapping inner motivational and professional resources, providing opportunities to engage in research activities with an internal locus of causality, a sense of psychological freedom, and perceived choice over their actions in the particular field (Reeve, 2009).

Students have a need to feel that they are the masters of their own studying and research process, that they have control over their academic life. The students' control can be increased by minimising external pressure through language and providing explanatory rationale to transform any task into one of personal value (Reeve, 2009). Hence students come to the doctoral programs with different backgrounds and experience – the use of language with professional and specific vocabulary as the medium of instruction can play a crucial role in students' autonomy because of limited professional vocabulary and possible language barriers in studying in a foreign language.

Competence represents the need to be effective in the students' pursuits and interactions with the environment. It reflects the inherent desire to exercise one's capacities during studies and to seek out and master environmental challenges (Deci & Ryan, 2008). So, students can go through some challenges and difficulties to prove and develop their competence. Competence concerns their achievements, knowledge, and skills to develop mastery over tasks. This competence can be supported by introducing appropriate learning and research activities at universities, providing students with the appropriate tools, techniques, and feedback for improvement (Niemic & Ryan, 2009).

Relatedness refers to the experience of a sense of belonging and connectedness to a group of other doctoral students, teachers, and professors during the study program. This is realised when students feel that a supervisor or professor genuinely respects and cares for them (Ryan & Deci, 2000). Relatedness is connected with the establishment of close emotional bonds and secure attachments with others. It reflects the desire to be emotionally connected to and interpersonally involved in warm, caring, and responsive relationships (Deci et al., 1991). So, relatedness can play a crucial role for doctoral students during studying and research, as doctoral study supposes a lot of individual work on the research and fewer interactions with other colleagues. It becomes a big challenge how students can relate to others in an authentic, caring, and reciprocal way, especially for international doctoral students who are far away from home.

Some research has combined the needs for autonomy, competence, and relatedness into one composite variable and the satisfaction of these needs has been positively associated with self-determined motivation, i.e. intrinsic motivation, identified motivation, and introjected motivation (Chen & Jang, 2010; Jang et al., 2009; Liu et al., 2009; Standage et al., 2003), but negatively associated with external regulation and amotivation (Liu et al., 2009; Standage et al., 2003). Both internal, personal factors and the social environment influence the degree to

which the three basic psychological needs can be satisfied (Ryan & Deci, 2000). Meeting these needs leads to personal growth, vitality, and well-being of students.

Prior research on doctoral experience has shown that motivation plays a significant role in students' engagement in doctoral studies. For instance, doctoral students who lack motivation for their studies are at risk of experiencing their academic scholarly community more negatively than their more motivated colleagues (Sakurai et al., 2017).

However, we still know relatively little about the motivation of doctoral students, despite the importance of motivation. At the same time the existing empirical literature on higher education, and specifically on study abroad, mostly has focused on the skills and benefits international students gain during international experiences but there has been limited research on international doctoral student motivation (Litalien et al., 2023). This is really curious, as an increasing number of educators are aware of the necessity to help students become motivated learners (Boekaerts & Cascallar, 2006; Pintrich, 2000; Schunk, 2005). This study analyses the international and domestic doctoral students' motivation at Hungarian universities with the help of SDT, as there is still a lack of research on doctoral students' motivation.

3. Methodology

Quantitative methodological design was used to analyse doctoral students' motivation to study at Hungarian universities. To generalise findings of the study to the population, a survey was used. Quantitative description of international and domestic doctoral students' motivation was provided by studying samples of those two populations with the help of a survey design. Quantitative design was utilised to answer descriptive questions and questions about relationships between two variables in this study.

3.1. Methods

The questionnaire "Why are you studying at a Hungarian university?" was developed based on the Language Learning Orientations Scale (LLOS): Intrinsic Motivation, Extrinsic Motivation, and Amotivation (IEA) subscales to categorise motivation into distinct types along a self-determinant continuum (Noels et al., 2008). Items which do not include any information about second language learning were kept initially as in the original questionnaire. Items related to the language learning orientations (Honestly, I don't know, truly have the impression of wasting my time in studying a second language) were adopted to examine motivation to study at Hungarian universities (Honestly, I don't know, truly have the impression of wasting my time in studying at the university). This questionnaire was used to analyse doctoral students' motivation to study at Hungarian universities. It is composed of 28 items subdivided into seven subscales assessing three types of intrinsic motivation (intrinsic motivation to get knowledge, accomplishment, and stimulation), three types of extrinsic motivation (identified regulation, external, introjection), and amotivation. All scales were formulated in English. On this questionnaire, the doctoral students were required to rate, based on a Likert scale, the extent to which the items correspond to why they are studying at a Hungarian university. The items were related to extrinsic motivation such as external regulation ("I study at university to have a better salary in the future"), introjected regulation ("I would feel guilty if I didn't study"), integrated regulation ("Studying at university is an important part of how I define myself"), intrinsic motivation to get knowledge ("Studying at university allows me to continue learning about many things that interesting for me;"), accomplishment ("I study for the satisfaction I feel when I am in the process of accomplishing my student's duties"), stimulation ("It's a great feeling to be able to study in Higher Institution") or amotivation ("I truly have the impression of wasting my time in the university where I am studying;"). Four statements were associated with each subscale.

3.2. Participants

The population of the study was represented by doctoral students who study at Hungarian universities and were split into two samples: domestic and international students. The sampling procedure involved convenience sampling based on the doctoral students' location in Hungary, studying at a Hungarian university on a full-time basis, their accessibility, and intention to take part in this study. The first sample consisted of 100 international students (54 females, 46 males, mean age = 35 with an age range from 25 to 45 years) from 19 Hungarian universities, the second sample constituted 100 domestic students (62 females, 38 males, mean age = 37 with an age range from 25 to 49 years) from 7 Hungarian universities. All participants stated their Hungarian university of study, major, level of English language proficiency, gender, scholarship holders' status, and country of origin for international students or city of origin for domestic doctoral students. English was the medium of instruction for their studies. To ensure that the students had sufficient time for adaptation to the university, the survey was conducted at the beginning of the second semester. The total time required to complete the questionnaire was approximately 10-15 minutes. All students provided their demographic information.

The students were represented equally based on the country of origin – 100 domestic and 100 international students from different programs of study such as Education, Economics, Pedagogy, Engineering, Psychology, Architecture, Physics, Finance and Accounting, Informatics Technology, Engineering, Mathematics, Biology, Chemistry, Applied linguistics, Safety and Security Science, International Law, Psychology, Applied Mathematics, Managements, etc.

International doctoral students indicated English language proficiency, as follows: 68 students indicated their level of English language as advanced, 14 as intermediate, and 18 as near-native or native. 100 % of students were scholarship holders of the Stipendium Hungaricum Scholarship Programme (2022). International students came from 38 different countries, such as Russia, Albania, Kenya, Azerbaijan, India, Kazakhstan, South Africa, China, Macedonia, Iran, Ghana, Tunisia, Angola, etc. took part in this research.

Domestic doctoral students indicated English language proficiency, as follows: 62 students as advanced, 7 as intermediate. All the participating students were scholarship holders. Hungarian doctoral students were from different cities, such as Budapest, Cegléd, Pécs, Inárcs, Fehérgyarmat, Szigetszentmiklós, Maglód, Kaposvár, etc.

3.3. Procedure

The questionnaire was designed in Google forms to make it user-friendly and easily accessible. The link to the questionnaire was distributed online among domestic and international doctoral students who were studying at Hungarian universities through social media in a direct message. The participation was voluntary and anonymous; each participant could choose the most convenient place and time to complete the questionnaire. The approximate length of filling this questionnaire is ten – fifteen minutes. The data was analysed using SPSS 24.0 (Statistical Package for the Social Science). For all the statistical analyses conducted, the level of significance was taken as .05. Mean and standard deviation were used for descriptive statistics. An independent sample *t*-test was conducted to see the differences between two groups of students.

4. Results and Analysis

The collected data from the questionnaire was scored and analysed based on the seven subscales formed on questionnaire - Language Learning Orientations Scale (Noels et al., 2003). The reliability of this study was verified by Cronbach's α to demonstrate the internal consistency (Hair, 2010). The Cronbach's α values ranged from 0.71 to 0.84, based on reliability analysis of the subscales,

all seven scales had a high reliability which are more than 0.7 (Dörnyei, 2007). See Table 1 for the listing of Cronbach's α for the seven subscales. These results indicate that the instrument seems to provide reliable results in the Hungarian universities contexts for doctoral students.

TABLE 1. CRONBACH'S ALPHA FOR THE SEVEN SUBSCALES

Motivation scale	Cronbach's alpha
Intrinsic motivation - to know	.84
Intrinsic motivation - accomplishment	.75
Intrinsic motivation - to experience stimulation	.81
Extrinsic motivation - identified	.72
Extrinsic motivation - introjection	.76
Extrinsic motivation - external regulation	.71
Amotivation	.78

Source: own calculations

Doctoral students' motivation to study at a Hungarian university was first analysed without differentiation between domestic and international students to see the general picture. Intrinsic motivation, extrinsic motivation, and amotivation are represented in seven subscales, for intrinsic motivation in knowledge, stimulation and accomplishment, for extrinsic motivation in identification, introjection and external regulation and amotivation. The participants in the study endorsed more items related to knowledge of intrinsic motivation ($M = 4.33$, $SD = 0.13$), after that to stimulation ($M = 4.15$, $SD = 0.29$) and identified regulation ($M = 4.05$, $SD = 0.29$) than to motivation to accomplish of extrinsic motivation ($M = 3.61$, $SD = 0.16$), external regulation ($M = 3.15$, $SD = 0.45$), Introjected motivation ($M = 2.85$, $SD = 1.17$) and amotivation ($M = 1.73$, $SD = 0.2$). Table 2 depicts participants' response patterns on the seven motivation subscales.

TABLE 2. SEVEN MOTIVATIONAL SUBSCALES

Motivation scale	Mean	Standard Deviation
Knowledge	4.33	0.13
Stimulation	4.15	0.29
Identified regulation	4.05	0.29
Accomplishment	3.61	0.16
External regulation	3.15	1.17
Introjection	2.85	0.45
Amotivation	1.73	0.2

Source: own calculations

Consider the number of doctoral students in Hungary: there are around ten thousand full-time doctoral students and nearly 32% are internationals according to the Central Statistical Office (KSH, 2024). There is a great need to get knowledge about doctoral students' motivation and significant differences in motivation among domestic and international doctoral students. Knowledge about motivation can be used in program support and development which fits more to the motivational characteristics of international and domestic doctoral students. For the

purpose of comparing doctoral students' motivation to study at a Hungarian university with respect to the country of origin: domestic or international independent sample *t*-test was conducted. In the event of a significant difference as a result of the comparative analysis, Tukey test was used to determine which group caused the difference.

According to Table 3, it is seen that there is no significant difference between the variable of the students' country of origin and Identified regulation ($F=0.000$; $p>.05$), motivation to get stimulation ($F=0.027$; $p>.05$). Similarly, there is no significant difference between country of origin and motivation to accomplish ($F=3.650$; $p>.05$). On the other hand, a significant difference was found between the variable of the student's country of origin and motivation to get knowledge ($F=8.463$; $p<.05$), introjected regulation ($F=4.573$, $p<.05$). The results of Tukey HSD analysis revealed that domestic doctoral students have significantly higher levels of motivation to get knowledge and introjected regulation compared to international students. In addition, a significant difference was found between the variable of the student's country of origin and amotivation ($F=7.860$; $p>.05$). International doctoral students have significantly higher level of amotivation compared to domestic doctoral students in Hungary. The table 3 represents the results of *t*-test analysis of doctoral students' motivation based on the country of origin.

TABLE 3. ANALYSIS OF DOCTORAL STUDENTS' MOTIVATION BASED ON THE COUNTRY OF ORIGIN

		Levene's Test for Equality of Variances		t-test for Equality of Means	
		F	Sig.	t	df
Identification	Equal variances assumed	.000	.993	-3.878	198
	Equal variances not assumed			-3.878	196.523
Knowledge	Equal variances assumed	8.463	.004 (higher among domestic students)	-4.491	198
	Equal variances not assumed			-4.491	173.173
Amotivation	Equal variances assumed	7.860	.006 (higher among international students)	3.352	198
	Equal variances not assumed			3.352	184.068
Introjected	Equal variances assumed	5.573	.034 (higher among domestic students)	-3.006	198
	Equal variances not assumed			-3.006	193.758
Stimulation	Equal variances assumed	.027	.869	-2.092	198
	Equal variances not assumed			-2.092	197.763
Accomplishment	Equal variances assumed	3.650	.058	5.122	198
	Equal variances not assumed			5.122	190.459
External	Equal variances assumed	.920	.339	5.589	198
	Equal variances not assumed			5.589	192.691

Source: own calculations

4.1. Discussion

The current study was designed to investigate doctoral students' motivation to study at a Hungarian university and significant differences in motivation based on the country of origin among domestic and international students. Two-factor model of intrinsic and extrinsic motivation proposed by the self-determination theory (SDT) of human motivation was used. A lot of empirical studies were conducted about academic motivation in the case of domestic students in quantitative or qualitative perspective (Alivernini et al., 2014; Bénabou & Tirole, 2003; Harackiewicz et al., 2002), but there is a lack of doctoral students' motivation research using the self-determination theory (SDT), specifically comparative studies between domestic and international doctoral students. The most common model to investigate international students' motivation to study abroad is the push and pull factors model (Baldwin & James, 2000). Political and economic factors appeared to be the most significant push factors. On the other hand, institutional factors tend to pull students to make a choice of the country to study, such as quality of the program, wider variety of courses, international reputation of the institution, location, degree of innovation, and the use of technology (Khudur, 2019).

The result of the analysis suggests that doctoral students' motivation can be reliably assessed using the intrinsic and extrinsic subtypes (Deci & Ryan, 1985; Vallerand, 1989; 1992). The fact that this instrument seems to work well in the Hungarian university context indicates that doctoral students have a higher level of intrinsic motivation than extrinsic motivation or amotivation. The dominant type named by 173 students in the current study was the motivation of getting knowledge through studying at a Hungarian university. These students did the study activities for the feelings associated with exploring new ideas and developing knowledge. The motivation of getting knowledge can be considered as the main pull factor for doctoral study at a Hungarian university. The next dominant type of motivation is stimulation (chosen by 166 students), which relates to motivation based simply on the sensations stimulated by performing the task, such as aesthetic appreciation or fun and excitement. For example, doctoral students expressed joy while discussing their research topics or findings with other colleagues. And then came identified regulation, named by 162 students, which is the most self-determined form of extrinsic motivation. At this point, doctoral students invest energy in study activity because they have chosen to do so for personally relevant reasons. These personal reasons can vary from desire to have a doctoral title in the future and work in academia to future career opportunities in the industry sector. In this situation, doctoral students would study because of its integral part of how they define themselves: as doctoral students, PhD candidate, and doctor. For instance, students who feel that pursuing a doctorate degree at a Hungarian university is an important aspect of their professional development will endure learning activities.

The next dominant type was motivation of accomplishment: doctoral students attempted to master a task or achieve a goal (Vallerand, 1997; Vallerand et al., 1989; Vallerand et al., 1992). They felt satisfaction with passing the examination, participating in research projects, publishing articles, solving problems during studying, and identifying research gaps. And then came stimulation, which relates to motivation based simply on the sensations stimulated by performing the task, such as aesthetic appreciation or fun and excitement. For example, doctoral students expressed joy while discussing research topics with other colleagues. The common basis of these three subtypes of doctoral students' motivation was the pleasurable sensations experienced during the self-initiated and challenging activities during study. Some doctoral students defined external regulation as a source of their studying activity. External regulation represents those activities that are determined by sources external to the students, such as costs of education or opportunity to get the scholarship, research grants, future prospects to get International Certificate of Higher education, possibilities to get a more prestigious job in the

future, traveling for conferences, and other tangible benefits. If the reason for studying at Hungarian university was taken away, there would be no incentive to continue the engagement in this process. At the same time some of the students were motivated by Introjected regulation. They performed study activities due to some type of pressure that has been incorporated into self so compelling themselves to carry out doctoral study at Hungarian university. The source of the pressure is internal, but it is not self-determined, because the people are reacting to external pressure, not acting based on personal choice (Vallerand, 1997). Students could be motivated to perform doctoral study due to the pressure from family, relatives, or from university professors.

Similar results were received in the study conducted by Tempus Public Foundation (Attraction and support of international PhD students, lecturers and researchers in Hungary: state-of-the-art, challenges and areas for improvement, 2022) to discover motivation of the international academics who move to Hungary for study or work at a Hungarian higher education institution. The data set was compiled from several countries in Central and South-East Europe, including Bulgaria, Croatia, Czech Republic, Hungary, North Macedonia, Poland, Romania, Serbia, Slovakia and Slovenia. Results of the study showed that acquiring knowledge and specific know-how from good practice was one of the key motivating factors shaping the respondents' decision to choose Hungary and its higher education institutions as a mobility destination. Two other top reasons included the possibility to work with outstanding scientists or lecturers in the field and the enhancement of future employment and career opportunities. These professionally oriented reasons were relevant for the dominating group of PhD students. Motivation for getting knowledge through studying at a Hungarian university was the dominant type among domestic and international doctoral students in both studies.

Another comparative study with the focus on domestic and international students was conducted to analyse satisfaction and motivation for doctoral studies in Finland (Sakurai et al., 2017). The results showed that students who started their degree with a low motivation to extend their career prospects were significantly less satisfied with their studies. That highlights the importance of motivation in doctoral study to be satisfied with the studying process. It was investigated that the international doctoral students started their studies with slightly stronger motivation to develop their own career prospects than the domestic students. The results showed that the ratio of international students who highly emphasised their opportunity to develop their career potential with a doctoral degree was more than double that of the domestic students. During the conducted study significant difference in the level of external regulation (career opportunities, etc.) was not identified among domestic and international doctoral students in Hungary, as it was discovered in Finland.

The results of the present study demonstrate the significant difference in doctoral students' motivation to study at a Hungarian university based on the country of origin. Domestic doctoral students demonstrated a relatively higher level of motivation to get knowledge and introjected regulation, compared to international doctoral students. So domestic doctoral students invested more energy in a study activity because of feelings associated with developing knowledge and exploring new ideas. In this situation, students experience the pleasure of studying at Hungarian universities and gaining knowledge in the particular field of study, conducting research and broadening their professional knowledge. Also, domestic doctoral students indicated a higher level of introjected regulation. Previous research has suggested that introjected regulation can be particularly harmful for PhD students, as it has been systematically associated with more pressure and undesirable consequences in long-term studies (Litalien, Guay, & Morin, 2012; Marais et al., 2018). Domestic doctoral students would feel more ashamed in front of family,

friends, or professors if they could not take the opportunity to pursue doctoral study compared to international doctoral students in Hungary.

At the same time international doctoral students demonstrated a higher level of Amotivation. In this situation international students see less relation between their actions and the consequences of those actions when the consequences are seen as arising as a result of factors beyond their control compared to domestic doctoral students. Some research results have combined the needs for autonomy, competence, and relatedness into one composite variable and the satisfaction of these needs has been negatively associated with external regulation and amotivation (Liu et al., 2009; Standage et al., 2003). It can therefore be considered that it is harder for international doctoral students to satisfy basic psychological needs such as autonomy, competence, and relatedness in a foreign country. A university environment can support doctoral students' autonomy by tapping on inner motivational and professional resources, providing opportunities to engage in research activities with an internal locus of causality, a sense of psychological freedom, and perceived choice over their actions in their particular field (Reeve, 2009).

To satisfy the need for competence, international students have to feel that they are in control of their own study. The students' control can be increased by minimising external pressure through language and providing explanatory rationale to transform any task into one of personal value (Reeve, 2009). Hence the use of English as a foreign language and the medium of instruction during international students' studying at a Hungarian university can play a crucial role in students' autonomy because of limited professional vocabulary and possible language barriers in studying in a foreign language.

The most difficult psychological need to satisfy for international doctoral students can be relatedness, which refers to the experience of a sense of belonging and connectedness to a group of other doctoral students, teachers, and professors during the study program. This is realised when students feel that a supervisor or professor genuinely respects and cares for them (Ryan & Deci, 2000). Relatedness is connected with the establishment of close emotional bonds and secure attachments with others. It reflects the desire to be emotionally connected to and interpersonally involved in warm, caring, and responsive relationships (Deci et al., 1991). So, relatedness can play a crucial role for doctoral students during studying and research, especially for international doctoral students who study far away from home in a foreign country.

Opposite results were received in the comparative study which was conducted to analyse motivation among local and international students in Singapore (Chue & Nie, 2016). The results of the study indicated that international students have a higher level of intrinsic motivation, identified regulation, external regulation. This result is the opposite to the result of the current study in Hungary, as domestic students demonstrated a higher level of motivation to get knowledge, and there is no significant difference in identified and external regulations among domestic and international doctoral students. The beneficial role of perceived psychological needs support is consistent for both local and international students. These results support the generalisability of SDT claims that perceived psychological needs support positively predicted self-determined motivation (intrinsic and identified motivation) and negatively predicted amotivation in both local and international students.

Satisfaction of basic psychological needs is positively associated with self-determined motivation, i.e. intrinsic motivation, identified motivation, and introjected motivation (Chen & Jang, 2010; Jang et al., 2009; Liu et al., 2009; Standage et al., 2003), and negatively associated with external regulation and amotivation (Liu et al., 2009; Standage et al., 2003). At the same time, both internal, personal factors and the social environment influence the degree to which the three basic

psychological needs can be satisfied (Ryan & Deci, 2000). Meeting these needs leads to personal growth, vitality, and well-being of international and domestic doctoral students.

5. Conclusion

Doctoral students' motivation to study at a Hungarian university can be investigated using the two-factor model of intrinsic and extrinsic motivation proposed by the self-determination theory (SDT) of human motivation. It was discovered that doctoral students demonstrated a high sense of self-determination towards intrinsic motivation. A higher sense of self-determination towards intrinsic motivation is connected with a satisfied individual's basic psychological needs of autonomy, competence, and relatedness (Deci et al., 1991). The three basic psychological needs of autonomy, competence, and relatedness represent the source of students' inherent and proactive intrinsically motivated tendency to seek out novelty, be more proactive, and pursue the optimal challenge. Generally, it can be suggested that doctoral students with a high sense of self-determination towards intrinsic motivation satisfied their needs of autonomy, competence, and relatedness at Hungarian universities. Students could feel the control of their behaviours, capacity to be engaged in target activities, and connected to others. Intrinsic motivation is expected to be facilitated when social factors such as the degree of autonomy support in the university environment satisfy the three basic psychological needs.

At the same time doctoral students' motivation varies depending on their country of origin: domestic or international students in Hungary. Domestic doctoral students demonstrated a higher level of motivation to get knowledge and introjected regulation, compared to international doctoral students. So domestic doctoral students invested more energy in a study activity because of feelings associated with developing knowledge and exploring new ideas, and performed study activities due to some type of pressure that has been incorporated into the self so they compelled themselves to carry out doctoral study at a Hungarian university. They could be motivated to perform doctoral study due to the pressure from family, relatives, or from university professors, who have some expectations regarding their professional development.

International doctoral students demonstrated a higher level of Amotivation compared to domestic students. In this situation, international students see less of a relationship between their actions and the consequences of those. Some research results have combined the needs for autonomy, competence, and relatedness into one composite variable, and the satisfaction of these needs has been negatively associated with external regulation and amotivation (Liu et al., 2009; Standage et al., 2003). It can be considered that it is harder for international doctoral students to satisfy basic psychological needs such as autonomy, competence, and relatedness in a foreign country context and Hungarian University. A university environment can support doctoral students' autonomy by providing opportunities to engage in research activities with a sense of psychological freedom, and perceived choice over their actions in the particular field (Reeve, 2009).

Empirical findings in SDT studies in the field of education have shown that a higher level of self-determination leads to positive educational outcomes, i.e. deeper engagement, better conceptual learning, and higher persistence (Areepattamannil et al., 2011; Black & Deci, 2000). The high level of self-determination among doctoral students who are studying at Hungarian universities can lead to a positive educational outcome. Learning outcomes describe the students' knowledge or skills that they should acquire by the end of a particular course or program.

There are a few limitations of the current study that need to be addressed in future. Firstly, the research does offer some confirmatory evidence for substantive aspects of SDT to investigate doctoral students' motivation to study at Hungarian universities using the two-factor model of intrinsic and extrinsic motivation. However, this study does not introduce any new theoretical

concepts. Future qualitative studies can be conducted to develop new theoretical frameworks regarding international and domestic doctoral students' motivation.

Secondly, the study focuses on a specific context of Hungarian universities, which limits the generalisability of the findings to other educational settings outside of Hungary. Thirdly, the data could be nested by the country of students' origin (Hungary, another particular country, or countries); future studies can examine the multilevel effects of the data. This study applied the two-factor model of intrinsic and extrinsic motivation on doctoral students' motivation to study at a Hungarian university.

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Data Availability

Data supporting the conclusions of this study can be made available upon reasonable request from the corresponding author.

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Motivational Disposition in English Writing Skills Development for EFL Pre-service Teachers: A Comparative Pilot Study of Myanmar and Hungary

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Abstract

Developing strong writing skills is essential for EFL pre-service teachers' career readiness and professional development especially in the age of artificial intelligence (AI). Myanmar and Hungary's English language teacher training programmes share similarities in practicum, course content, aims, assessment, and professional development initiatives, but differ in class and group sizes, and governmental initiatives in second language (L2) research. Their shared emphasis on English teacher training despite their distinct educational contexts brought the researchers to conduct this comparative pilot study. Despite extensive L2 motivation research in English language teaching (ELT), the motivational disposition of EFL pre-service teachers in English writing remains unexplored in both countries. Current English teacher training programmes in both contexts emphasise quality teaching for academic achievement, particularly in English writing. This study addresses this gap and its implications for skills development and employability, by presenting results from a quantitative questionnaire study, focusing on the *process writing approach*. The study aims to assess the reliability of the pilot questionnaire developed by the researchers, explore pre-service teachers' motivational disposition in English writing, and identify dimensions contributing most to motivated learning behaviour. Statistical analyses, including Cronbach's alpha and linear regression, were conducted, revealing differences in motivators between Myanmar and Hungarian participants. The study concludes with recommendations for enhancing *intrinsic motivation* in Myanmar and

emphasising *ideal L2 selves* in Hungary to improve EFL pre-service teachers' motivated learning behaviour and writing performance. These insights also contribute to strengthening teacher training practices, fostering sustainable careers, and equipping pre-service teachers with critical skills that are crucial for their educational and professional success in the long run.

Keywords/key phrases: EFL pre-service teachers, motivational disposition in English writing, process writing approach, writing skills development, employability skills

1. Introduction

English writing is a vital skill for EFL students, including pre-service teachers, as it enhances communication with others and supports their professional and career development (Bailey, 2015; Hyland, 2021). However, several students struggle with confidence, organising ideas in writing, and lack technical writing skills, owing to inadequate instruction and low motivation (Bailey, 2015; Hyland, 2021; Saddler, 2023). Given the emergence of AI writing tools in recent years, human-centric skills such as creativity, critical thinking, adaptability, and effective communication remain essential skills for employability and career sustainability among pre-service teachers. Hence, improving students' writing skills in a motivating way has become a key challenge for EFL teachers (Hyland, 2021; Saddler, 2023).

Motivation plays a significant role in English writing, providing students with the drive and enthusiasm needed to complete writing tasks (Csizér, 2019; Dörnyei & Ushioda, 2021; Rianti, 2023). Motivated students are more likely to produce quality work, overcome obstacles like thought blocks, and remain focused and engaged throughout the writing process, leading to better outcomes (Hyland, 2021; Saddler, 2023).

This comparative pilot study is the result of earlier and current research. The previous work-based investigation (Maung et al., 2022) was a pilot study measuring EFL pre-service teacher's motivational disposition in English writing, at the two teacher training universities in Myanmar, with a special focus on the *process writing approach*, while the other study did the same in the Hungarian context. Notwithstanding the fact that extensive L2 motivation research in the English language teaching (ELT) field has been conducted in both contexts for some decades, EFL pre-service teachers' motivational disposition in English writing is an unexplored niche in L2 motivation research in the two countries.

Both studies aimed to assess the reliability of constructs in the pilot questionnaire, developed by the researchers, across Myanmar and Hungary. The primary goal was to explore EFL pre-service teachers' motivational disposition towards English writing, particularly in the *process writing approach*. Furthermore, the researchers were curious which dimensions of English writing contribute the most to the motivated learning behaviour of pre-service teachers in the two contexts with a view to informing pre-, and in-service teachers so that they can focus on these dimensions while teaching English writing. These reasons lead the researchers to be concerned with the exploration of the two contexts of Myanmar and Hungary, and presenting and comparing the pilot results from the two contexts in the following sections.

This comparative pilot study fills the gaps in both contexts by presenting the results of a quantitative questionnaire study which aid EFL teacher educators in training EFL pre-service teachers in a more motivating manner with a special focus on the *process writing approach*. By fostering a more motivation-driven learning environment, they will be better equipped to meet

the growing demands of language education and develop sustainable careers in an increasingly dynamic professional landscape.

2. The Myanmar and the Hungarian Contexts

Myanmar and Hungary are countries in which the teacher training universities run similarly organised English language training programmes. EFL aspects taught include the teaching practicum, general content and course aims, assessment strategies, and governmental initiatives on professional development programmes for teacher trainers. Some differences between the two countries lie in class and group sizes, and governmental initiatives in second language (L2) research (Csizér, 2020; Khine & Liu, 2022; Ministry of Education, 2016). As things stand today, English teacher training programmes in both contexts demand quality teaching from teacher trainers in order for students to achieve academic success, especially in English writing (Csizér et al., 2024; Khine & Liu, 2022). In other words, developing EFL teacher educators' competencies in teaching writing skills in a more motivating manner plays a salient role in their students' successful English writing outcomes.

3. Literature Review

3.1. Understanding the L2 Motivational Self-System, Significant Others and Instrumentality

In 2005, Hungarian psycholinguist Zoltán Dörnyei introduced the L2 Motivational Self-System (L2MSS), a theory blending Higgins' (1987) self-discrepancy theory with Markus and Nurius' (1986) concept of possible selves. This model, which emerged from a 2002 nationwide study on the L2 motivation of Hungarian students, consists of three main components: the ideal L2 self, the ought-to L2 self, and the L2 learning experience.

Markus and Nurius (1986) proposed that possible selves—representations of what individuals aspire to become or wish to avoid—serve as powerful motivators in second or foreign language learning. These possible selves link the self to action, enabling learners to imagine themselves successfully acquiring an L2. Markus and Ruvolo (1989) described possible selves as “super motivators,” which are deeply connected to an individual's thoughts and feelings and significantly influence motivated behaviour in L2 acquisition.

Higgins (1987, 1989) further refined the concept of possible selves, introducing the ideal self, the ought self, and the actual self. The ideal L2 self embodies an individual's hopes and aspirations, serving as a strong motivator for academic achievement. In contrast, the ought-to L2 self is associated with duties and obligations, motivating individuals through a sense of responsibility. The actual self represents the current self-perception of the individual. According to Higgins, while the ideal L2 self drives learners towards their goals through aspirations, the ought-to L2 self compels them to avoid negative outcomes and meet expectations.

Csizér (2019, 2020) elaborated on the ideal and ought-to L2 selves, noting that the ideal L2 self reflects how learners envision themselves as proficient L2 users, while the ought-to L2 self is shaped by external pressures acknowledged during the learning process. Both are critical in guiding goal achievement in L2 learning. These selves, viewed as future-oriented, can significantly influence the learner's success or failure, with ideal self-guides being promotion-focused and linked to aspirations, and ought-to self-guides being prevention-focused, associated with responsibilities.

The third component of L2MSS, the L2 learning experience, involves learners' attitudes towards the classroom environment and language use. It encompasses situational factors such as the influence of classmates, teaching strategies, feedback, curriculum, and past language learning experiences. The role of significant others - teachers, classmates, peers, and family members - is especially crucial in shaping motivation. Csizér (2019, 2020) highlighted how social and environmental factors, including interactions with these significant others, can strongly influence learners' perceptions and cognitive processes. Dörnyei and Ushioda (2021) also emphasised the importance of social and contextual influences, which they categorised into internal factors (like intrinsic interest and self-concept) and external factors (such as interactions with others and the learning environment).

Moreover, instrumental orientation plays a pivotal role in L2 motivation, particularly in academic achievement and writing. Csizér et al. (2024) and Rianti (2023) defined instrumental motivation as the drive associated with practical benefits of L2 acquisition, such as passing exams or securing scholarships. This form of motivation is often seen as a subtype of extrinsic motivation, characterised by external rewards and a pragmatic focus (Ryan & Deci, 2018). According to Csizér et al. (2024) and Rianti (2023), instrumentally motivated learners are goal-oriented, driven by rewards such as personal fulfilment or social status, which significantly facilitate L2 acquisition.

In conclusion, the motivational dispositions within the L2 Motivational Self-System are interconnected and significantly impact a learner's motivation in L2 acquisition, including writing skills. If the teacher understands the motivational disposition of learners and knows ways to encourage learners by strengthening students' motivated learning behaviour in the English writing class, it is more likely that students will have more favourable achievements in learning the L2.

3.2. Students' Motivation and Academic Resilience

Research shows that motivation and academic resilience are closely linked in students' academic performance, including writing skills (Reschly & Christenson, 2022; Zhang, 2022). Academic resilience refers to a student's ability to persist through challenges, adapt to academic demands, and recover from setbacks (Reschly & Christenson, 2022). Zhang (2022) highlights that motivation and resilience reinforce each other: motivated students are more likely to develop resilience, while resilient students maintain motivation despite setbacks. Highly motivated students typically exhibit positive attitudes toward learning, seek support, and engage in proactive behaviours when facing challenges (Reschly & Christenson, 2022; Zhang, 2022). This reciprocal relationship suggests a strong positive correlation between students' motivation and academic resilience, both crucial for academic success, including mastering English writing skills. Consequently, resilience was chosen as one of the motivational dimensions in the pilot questionnaire of this study.

3.3. Competition and Students' Motivation

Garcia et al. (2024) define competition as a situation where individuals or groups strive to outdo each other to achieve a goal, such as winning a game or earning a promotion. In education, competition can motivate students to work harder, improve their skills, and strive for excellence, including in English writing (Fülöp et al., 2025; Garcia et al., 2024). Fülöp et al. (2025) found that students from different cultures view competition as a means of improvement. However, excessive competition may lead to stress and negative emotions (Garcia et al., 2024). Therefore, a balance between competition and cooperation is crucial, recognising that success is not solely about

defeating others (Garcia et al., 2024). Acknowledging that teachers and parents should foster a healthy competitive culture that supports growth prompted its inclusion in a pilot questionnaire on motivational dispositions among Myanmar and Hungarian EFL pre-service teachers.

3.4. Three Approaches to Teaching Writing

3.4.1. The product approach

The product approach to teaching writing emphasises the final written product, focusing on grammar, syntax, and organisation. This teacher-centred method involves providing students with models of well-written pieces and detailed feedback to guide their revisions. However, this approach may limit creativity, as students are primarily concerned with producing a correct final product. It also often overlooks the importance of pre-writing activities like brainstorming, which are essential for idea development and organisation (Bailey, 2015; Hyland, 2021).

3.4.2. The process approach

In contrast, *the process approach* emphasises the stages of writing - brainstorming, drafting, revising, editing, and publishing. It is a student-centred method that encourages writing freely and the recursive nature of writing, where revision is an integral part of the process. This approach fosters creativity and helps students develop the skills necessary for effective writing, making it suitable for beginners (Bailey, 2015; Hyland, 2021).

3.4.3. The genre approach

This is an updated version of *the product approach* which focuses on writing within specific genres, such as narratives and research papers. It emphasises understanding the purpose, audience, and conventions of different text types. While beneficial for skilled writers, this approach may not provide enough guidance on the writing process for beginners, making it less suitable for those at the start of their academic careers (Caplan & Johns, 2022; Hyland, 2021).

Given that teacher trainees are at the beginning of their academic journey, *the process approach* has been selected for the present study, as it better supports the development of writing skills and creativity necessary for their growth as writers.

4. Method and Procedure

Based on the reviewed literature and the purpose of the comparative study, the following research questions were formulated.

1. Are the constructs of the pilot questionnaire reliable in the Myanmar and Hungarian contexts?
2. What characterises pre-service teachers' motivational disposition in English writing in the two contexts?
3. What dimensions of English writing contribute the most to the motivated learning behaviour of pre-service teachers in the contexts?
4. What are the similarities between the two countries in terms of the comparative pilot results?
5. What are the differences between the two countries in terms of the comparative pilot results?

To fulfil the main aim of the research, the researchers developed their own questionnaire containing a total of 12 scales made up of 67 items related to the L2 motivational dimensions in English writing plus a criterion variable scale: motivated learning behaviour. The following lists all the constructs: topic *difficulty*; teacher's *assessment, comment, and feedback*; writing *topics*; *pre-writing activities*; teacher's *strategies*; *significant others*; *ideal L2 self*; *intrinsic motivation*; *instrumental motivation*; *resilience*; *competition*; and *motivated learning behaviour*, the criterion variable scale.

Purposive sampling method was used to collect the required data. The pilot questionnaire was first administered to 54 Myanmar EFL pre-service teachers at a teacher training university in September 2020. Subsequently, 40 Hungarian participants in English language programmes at a public university were surveyed via online questionnaires in November 2021. One of the strengths of the questionnaire data collection instrument is that it is simple to design, highly adaptable, and effective in rapidly gathering a large amount of data in an easily analysable format (Csizér, 2019; Litosseliti, 2025). The age range of participants varied due to differences in educational systems: Myanmar participants were aged 16–20, while Hungarian participants were aged 18–21. In both contexts, it was presented in English, as all participants were from English language programmes. Considering ethical principles, the respondents from both countries participated voluntarily and anonymously in this study. In the Myanmar education system unlike the Hungarian context, students who had reached the age of 16 and completed the matriculation examination were eligible to enter university for tertiary education. As per Myanmar's cultural and educational norms, students aged 16 and above were considered capable of providing informed consent without requiring parental approval. The study was conducted in Myanmar four months before the military coup 2021, which made it possible to collect data online while the country remained stable.

Data were analysed using IBM SPSS Statistics (Version 29), and the results were interpreted to answer the research questions. The statistical analyses were divided into descriptive and inferential analyses. For descriptive statistics, mean scores and standard deviations were analysed to assess the central tendencies and variability of the motivational dimensions. Differences and similarities in performance across the overall scale and its components were examined to provide comparative insights between Myanmar and Hungarian participants. For the inferential statistics, reliability analysis using Cronbach's alpha was employed to measure internal consistency. Linear regression analysis was also conducted to assess which motivational dimensions contributed most to motivated learning behaviour.

5. Results and Discussion

5.1. Reliability Analyses of the Scales

Tables 1 and 2 show the Cronbach's alpha reliability coefficients of the scales in the Myanmar and Hungarian contexts respectively, which were calculated to answer the first research question (Are the constructs of the pilot questionnaire reliable in the Myanmar and Hungarian contexts?).

TABLE 1. RELIABILITY COEFFICIENT OF THE SCALES IN THE MYANMAR CONTEXT

	Construct	Cronbach's α
1	difficulty	.458
2	assessment	.255
3	topic	.608
4	pre-writing	.703
5	strategies	.514
6	setting	.646
7	significant others	.651
8	ideal L2 self	.640
9	intrinsic motivation	.660
10	instrumental motivation	.718
11	resilience	.543
12	competition	.771
13	motivated learning behaviours	.692

Source: own calculations

Where the Cronbach's alpha coefficients of the scales did not reach the 0.6 cut off point, some results from the Myanmar pilot had to be excluded from the discussion. However, before the instrument was administered in the Hungarian context, the scales were improved with the help of principal component analysis (PCA).

TABLE 2. RELIABILITY COEFFICIENT OF THE SCALES IN THE HUNGARIAN CONTEXT

	Construct	Cronbach's α
1	difficulty	.801
2	assessment	.725
3	topic	.599
4	pre-writing	.803
5	strategies	.632
6	significant others	.749
7	ideal L2 self	.678
8	intrinsic motivation	.781
9	instrumental motivation	.800
10	resilience	.703
11	competition	.785
12	motivated learning behaviours	.824

Source: own calculations

The high Cronbach's alpha results of the revised scales in the Hungarian context proved the internal reliability of the measured dimensions, which made it possible to conduct further analyses with the variables in the Hungarian context.

5.2. Comparative Analyses of the Scales

Subsequently, descriptive statistics of the nine remaining scales from the Myanmar context and all the scales from the Hungarian context were computed to answer the second research question (What characterises pre-service teachers' motivational disposition in English writing in the two contexts?) related to the motivational disposition of the participants. Tables 3 and 4 show the

results of the descriptive statistics of the scales, their mean values and standard deviation values in the Myanmar and Hungarian contexts respectively.

TABLE 3. DESCRIPTIVE STATISTICS OF THE SCALES IN THE MYANMAR CONTEXT

	Construct	Mean	Std. Deviation	
1	ideal L2 self	4.32	.43	
2	instrumental	4.29	.47	
3	topic	4.11	.51	*
4	pre-writing	4.11	.49	
5	intrinsic	4.02	.51	
6	significant others	3.81	.58	
7	competition	3.76	.67	*
8	setting	3.64	.46	
9	motivated learning behaviours	4.41	.50	

Source: own calculations

* The lines indicate a significant difference between the scales based on paired samples *t*-tests ($p < 0.05$).

TABLE 4. DESCRIPTIVE STATISTICS OF THE SCALES IN THE HUNGARIAN CONTEXT

	Construct	Mean	Std. Deviation	
1	assessment	4.33	.52	*
2	instrumental	4.03	.74	
3	pre-writing	3.68	.68	
4	ideal	3.68	.71	*
5	strategies	3.62	.72	
6	topic	3.58	.61	
7	intrinsic	3.46	.76	*
8	resilience	3.40	.73	*
9	significant others	3.14	.76	
10	difficulty	2.97	.86	
11	competition	2.96	.82	
12	motivated learning behaviours	3.79	.82	

Source: own calculations

* The lines indicate a significant difference between the scales based on paired samples *t*-test ($p < 0.05$).

When we observe the statistical results from Table 3, several conclusions can be drawn for the Myanmar context. Firstly, the two dimensions of *ideal L2 self* and *instrumental motivation* display the highest mean values (4.32 and 4.29). Moreover, a paired sample *t*-test showed that there is no significant difference between them. Statistically speaking, these two scales are equally motivating for pre-service teachers in their English writing in the Myanmar context. As discussed in the literature review, several studies have confirmed that the *ideal L2 self* can have a positive impact on both second language learning, and the acquisition of writing skills, and students who have strong *ideal L2 selves* are more motivated to learn the target language and set higher goals for themselves (Papi, 2022; Csizér, 2020). The studies claimed that when students are motivated by their *ideal L2 selves*, they also tend to engage in more self-directed learning behaviours, such as seeking out language learning opportunities and practicing outside of class to improve their L2 learning. With regard to *instrumental motivation*, learning is enhanced by motivation, as students driven by instrumental motives demonstrated longer study durations compared to their non-instrumentally motivated counterparts when presented with the chance to gain from the learning experience (Sadik, 2025; Schiller and Dorner, 2022). This evidence was also supported by Maung et al. (2022)'s Myanmar study claiming that

instrumentally motivated pre-service teachers were willing to spend more time on finding the correct answer related to their task, and accordingly, instrumental motivation greatly impacted on their English writing in the observed context.

In the Hungarian context, the dimensions teacher's *assessment* and pre-service teachers' *instrumental motivation* yielded the highest mean values (4.33 and 4.03) but a paired sample *t*-test revealed that there was no significant difference between them. Consequently, the two dimensions were statistically deemed to be equally motivating for participants engaged in English writing activities. This finding is empirically supported by Hyland (2021) and Saddler (2023) whose research indicates that teachers' assessment practices play a pivotal role in shaping students' attitudes and enthusiasm towards writing tasks. They also claim that teacher assessment substantially influences the motivation of students engaged in English writing activities. These findings contribute to the broader understanding of the multifaceted dynamics between teacher assessment and student motivation in the domain of language learning including the acquisition of writing skills.

Interestingly, it was also found that pre-service teachers' *instrumental motivation* is a common powerful motivator in both contexts in the current comparative study, echoing the research findings of Dörnyei and Ushioda (2021), Lamb et al. (2019), and Maung et al. (2022) presented above.

Further examination of the data in Table 3 reveals that the dimensions *topic*, *pre-writing*, and *intrinsic motivation*, exhibit similar mean scores (4.11, 4.11 and 4.02 respectively) and standard deviation scores (.51, .49, and .51 respectively). This indicates a somewhat lower level of motivation for participants in their English writing in terms of *topic*, *pre-writing* and *intrinsic motivation* when compared to the initial two dimensions. Nevertheless, values toward the higher end of the Likert scale imply that pre-service teachers believe their motivation is influenced by a familiar topic, they express confidence in draft writing, and they found intrinsic enjoyment from the writing process. The research outcomes here validate previous assertions in the literature, specifically supporting findings that highlight the positive impact of topic interest on enhancing English writing skills among novice writers. Such interest is shown to bolster motivation and intellectual engagement, with a correlation between high-interest topics and the production of superior texts (Bailey, 2015). Various studies, including those by Hyland (2021), Saddler (2023) and Rianti (2023) underscored the importance of drafting for undergraduate students, demonstrating a positive association between the number of drafts generated and text improvement. Furthermore, students exhibit motivation in writing and reduced anxiety when applying writing processes that contribute to the acquisition of linguistic writing skills such as planning, revising, drafting, editing, and producing (Bailey, 2015; Hyland, 2021; Saddler, 2023).

In the Hungarian data, the four dimensions, *pre-writing activities*, *the ideal L2 self*, *the teacher's strategies* and *topic*, displayed similar mean values (3.68, 3.68, 3.62 and 3.58 respectively) and standard deviation scores (.68, .71, .72 and .61 respectively), suggesting that these dimensions are perceived as somewhat less motivating. However, they still fall within the higher range of the Likert scale, ranging from 3.58 to 3.68. This indicates that pre-service teachers believe that they are inspired to write effectively when the teacher assigns them *pre-writing* activities before letting them engage in actual writing tasks. The research findings confirmed the results of previous studies claiming that *pre-writing* activities exhibit a positive impact on students' motivational levels, and teacher's guided pre-writing exercises, e.g., brainstorming, contribute significantly to heightened motivation (Johnson, 2024; Saddler, 2023). Their findings indicate that students who participate in

purposeful *pre-writing* activities tend to approach English writing tasks with increased confidence and enthusiasm. Additionally, their research results highlighted the importance of incorporating diverse and stimulating *pre-writing* strategies to cater to the varied needs and preferences of students (Hyland, 2021; Saddler, 2023; Young & Ferguson, 2020). These results emphasise the potential of well-designed *pre-writing* activities as a valuable pedagogical tool to enhance motivation in the context of English writing.

The mean scores for the last three dimensions in the Myanmar context—*significant others*, *competition* and *setting*—exhibited the lowest mean values, ranging from 3.81 to 3.64, with no statistically significant differences. Essentially, the pre-service teachers seem to feel somewhat demotivated when engaged in English writing activities by their immediate social milieu (including teachers, parents, friends, and classmates), competitive scenarios (whether individual or group-based), and aspects of the classroom environment such as the utilisation of digital devices or colourful visuals as aids in their writing endeavours.

Concerning the motivational dimension associated with the *ideal L2 self*, the research outcomes from the Myanmar setting align with prior studies asserting its potency as a motivator for second language (L2) acquisition (Papi, 2022; Lamb et al., 2019). Additionally, a substantial portion of the variance in achievement within the target language is attributed to the *ideal L2 self* (Csizér, 2020; Lamb et al., 2019; Schiller & Dörnyei, 2022). Drawing from these findings, it can be extrapolated that the *ideal L2 self* of pre-service teachers significantly influences both their motivation and performance in English writing to a great extent. Regarding instructional *strategies* employed by teachers, prior research evidence indicates that meticulously crafted and engaging approaches have a substantial impact on students' motivation towards writing tasks. Saddler (2023) and Teng (2022) for instance, demonstrated that explicit writing instruction, encompassing elements like goal setting, utilisation of writing processes, self-regulation, and feedback, positively affected both the motivation and performance of students in writing. Furthermore, innovative methods, including individual or group brainstorming, peer collaboration, and the integration of real-world relevance into writing assignments, have been linked to heightened motivation among students (Bailey, 2015; Hyland, 2021). These findings underscore the significance of teachers embracing a comprehensive approach that attends to both the cognitive and affective dimensions of writing instruction to nurture motivation in students' English writing proficiency.

As far as the motivating aspect of the writing *topics* is considered, the research findings from the Myanmar context corroborated the results of the previous studies claiming that well-designed and relevant writing topics enhance student engagement, motivation, and overall writing proficiency. For example, Bailey (2015) and Rianti (2023) emphasised the importance of providing students with meaningful and authentic writing tasks, demonstrating a positive correlation between task relevance and writing performance. Additionally, Rianti (2023), Saddler (2023) and Teng (2022) highlighted the role of interest in fostering motivation and persistence in writing activities by declaring that effective writing *topics* not only contribute to linguistic development but also stimulate critical thinking and creativity. According to them, university teachers are encouraged to carefully consider the appropriateness and relevance of writing *topics* to optimise students' English writing performance.

If we move to the fourth and fifth bands of Table 4, the mean values of the three dimensions, i.e., *intrinsic motivation*, *resilience*, and *significant others* revealed lower mean values compared to the

previous six dimensions, ranging from 3.14 to 3.46, in the Hungarian context. The data indicate that these dimensions seem to be the second least motivating aspects in the participants' motivational disposition in English writing in the context investigated.

The mean values of the last two dimensions, *difficulty* and *competition*, resulted in the lowest mean values and standard deviation scores with no significant differences between them ranging from 2.96 to 2.97 and 0.82 to 0.86 respectively. These findings suggest that topics *difficulty* and *competition* are the least affecting motivators in the motivational disposition of Hungarian participants toward English writing. In essence, pre-service teachers exhibit lower motivation in English writing activities when faced with challenging topics, and competitive scenarios, whether individual or group-based, that do not positively impact their motivation. Notably, the scale "*competition*" emerged as common and one of the least powerful motivators both in the Hungarian and Myanmar contexts, implying that pre-service teachers from neither context find competitive situations conducive to enhancing their motivation in English writing.

5.3. Linear Regression

To determine which dimensions most significantly contributed to participants' motivated learning behaviour across both contexts (research question 4), the researchers conducted linear regression analyses. The comparative results are presented in Table 5.

TABLE 5. COMPARATIVE RESULTS OF REGRESSION ANALYSES OF THE MOTIVATIONAL SCALES WITH MOTIVATED LEARNING BEHAVIOUR AS THE CRITERION VARIABLE IN THE MYANMAR AND HUNGARIAN CONTEXTS (SIGNIFICANCE LEVEL $P < .05$)

	Variable	Myanmar β	t	P	Hungary β	t	P
1	intrinsic motivation	.446	3.797	<.001	-	-	-
2	ideal L2 self	.314	2.673	<.001	.569	4.765	<.001
3	pre-writing	-	-	-	.314	2.632	<.001
	R ²	.411			.592		

Source: own calculations

During the regression analysis, all variables were initially calculated, and the most powerful independent variables were selected based on their statistical contribution to the dependent variable (motivated learning behaviour), rather than solely relying on their Cronbach's alpha values. Based on the regression coefficients and statistical influence, the two strongest independent variables from each context, *intrinsic motivation* and *ideal L2 self* in Myanmar, and *ideal L2 self* and *pre-writing* in Hungary, were selected as the basis for comparing the two contexts in the final results.

The outcomes derived from the regression analysis in the Myanmar context indicate that 41% of the participants' motivated learning behaviour can be explained by two dimensions, *intrinsic motivation* and *the ideal L2 self*. Upon scrutinizing the β coefficients associated with these dimensions, it becomes evident that the influence of *intrinsic motivation* (.446) surpasses that of the *ideal L2 self* (.314). Consequently, it is reasonable to infer that *intrinsic motivation* assumes a more pivotal role in motivating pre-service teachers in the Myanmar context. The findings of the pilot study in Myanmar affirm Rianti (2023) and Ryan and Deci (2020)'s assertion regarding intrinsic motivation, revealing its positive influence on the motivated

learning behaviour of pre-service teachers. This impact, in turn, is associated with enhanced performance in English writing tasks. Moreover, these outcomes align with Kwon (2023)'s mixed-methods study on English major students in Korea. Kwon demonstrated that the *ideal L2 self* works best in predicting learners' motivated behaviour when they perceive a second language as a means of personal development and meaningful interaction with others including teachers and peers. The present pilot study thus supports and extends the generalisability of these assertions to the specific context of pre-service teachers and their English writing proficiency.

In the Hungarian context, 59% of the participants' motivated learning behaviour can be explained by two dimensions – *the ideal L2 self* and *pre-writing* activities. Again, when comparing the β coefficients of the two scales, it may be observed that the impact of *the ideal L2 self* (.569) is almost twice as strong as that of *pre-writing* (.314). These results confirmed by Dörnyei and Ushioda (2021), Hyland (2021), Saddler (2023) and Young and Ferguson (2020) indicate that learners require a portfolio of task-based techniques that are triggered by the activation of their *ideal L2 self*. In this regard, they recommended effective guides for second language teachers which are comprehensive, encompass an imagery/vision component capable of eliciting suitable emotions, and align with various pertinent plans, scripts, and self-regulatory strategies. The integration of these various components forms a cohesive motivational conglomerate for learners, emphasising the interconnected functioning of motivation, cognition, and emotion as integral to effective language learning including writing.

6. Comparative Discussions and Practical Implications

The results of this comparative study demonstrate that after revising the scales, the questionnaire was ready to be used as its constructs proved to be reliable. This pilot study aimed to achieve several goals: firstly, to pilot and validate a newly developed questionnaire in Myanmar and Hungary; secondly, to explore the motivational disposition of EFL pre-service teachers in English writing activities in both contexts; thirdly, to identify which aspects of English writing most significantly influence the motivated learning behaviour of these pre-service teachers; and finally, to uncover similarities and differences between the two countries regarding L2 motivation in the *process writing approach*.

Initially, during the Myanmar pilot study, some Cronbach's alpha coefficients were insufficiently high, leading to the exclusion of certain scales from the discussion. However, before administering the questionnaire in Hungary, the scales were refined using principal component analysis (PCA). The improved Cronbach's alpha results in the Hungarian context confirmed the internal reliability of the measured dimensions, enabling further analysis of all variables in this context.

6.1. Theoretical Implications

Descriptive statistic results reveal that *instrumental motivation* was a powerful motivator in the contexts investigated. The participants from both contexts believe that being able to write academically may contribute to academic and career success. However, according to comparative analysis results, it is significant that the Myanmar participants were more self-driven, recognising writing as an essential personal skill for their future career, whereas the Hungarian participants relied more on teacher feedback and assessments. These findings support Csizer (2021), Csizer et al. (2024), Dörnyei and Ushioda (2021), Rianti (2023) and

other existing L2 motivation theories, highlighting the fact that context-specific adaptations in writing pedagogy with self-regulated learning strategies are crucial to improve Myanmar EFL pre-service teachers' writing skills, while teacher-mediated approaches are more effective for the Hungarian participants.

6.2. Research Implications

Again, comparative analyses results indicated that *competition* exhibited the lowest mean value in both countries (3.76 in the Myanmar context and, 2.96 in the Hungarian context), implying that pre-service teachers preferred structured guidance or personal goal setting over competitive writing tasks. Furthermore, the linear regression results revealed key motivational differences in the two contexts:

- *Intrinsic motivation* was the most powerful motivator in Myanmar, suggesting that students, themselves, were internally driven to improve their writing skills without needing external force.
- *Ideal L2 self* was the most influential motivator for the Hungarian students, which means that they were more motivated by their vision of themselves as future proficient English writers.

Further research is recommended to investigate how the emergence of AI writing tools influence these motivational aspects, especially for supporting self-motivated students in Myanmar, and providing teacher's constructive feedback to the Hungarian students.

6.3. Societal Implications

Additionally, the descriptive and comparative analysis results proved that teacher's feedback played a crucial role in the two settings, but with different application approaches.

- Hungarian pre-service teachers valued structured grading and teacher input, to be exact, the teacher's constructive feedback on their multiple written drafts could enhance their motivation in writing.
- Myanmar pre-service teachers rely more on their intrinsic efforts, implying that individual brainstorming and expressing their own ideas in written texts could further strengthen their intrinsic motivation.

These findings highlight the need for customised instructional strategies by teachers, e.g., formative assessment and constructive feedback in the Hungarian setting, while autonomous writing activities and obtaining the opportunity to include individual ideas in their writings in the Myanmar context could align with students' motivational profiles for their writing skills development.

6.4. Policy Making Implications

According to the linear regression results, *intrinsic motivation* (.446) for the Myanmar participants, and *ideal L2 self* (.569) for the Hungarians were the strongest variables which contributed the most to their *motivated learning behaviour*, suggesting that the curricula for teaching writing should align with these motives. Educational policymakers from the Myanmar context should consider implementing professional development programmes for English teacher educators to promote their teaching writing strategies in a way that makes students enjoy the writing process more, whereas those in the Hungarian context should encourage developing

writing programmes that emphasise students' long-term skills development and recognition in writing, such as providing opportunities for students to publish their work, workshops on academic writing and reinforcing portfolio-based assessments which may lead to not only their writing skills development but also overall academic achievements.

Despite its valuable insights and implications, this study is geographically limited to Myanmar and Hungary, focused only on a quantitative approach, and had a limited sample size due to collecting data online during the pandemic, which may affect the generalisability of the findings. Additionally, since it was conducted before the emergence of AI writing tools, there was a lack of exploration of the comparison between those AI tools and the process writing approach, and their impact on students' motivation in writing. However, those limitations have been explained in follow-up mixed-methods studies since it was part of a doctoral research project.

7. Conclusion

Ultimately, by integrating the insights presented in this comparative pilot study into EFL teacher training programmes, teacher educators can foster a motivation-driven learning environment that promotes pre-service teachers' self-regulated learning, creativity, and continuous professional development, ensuring that they develop the reflective and pedagogical skills necessary for long-term success in their future career. Furthermore, enhancing *intrinsic motivation* in Myanmar and reinforcing *ideal L2 selves* in Hungary will not only strengthen writing proficiency and communication skills but also equip students with critical thinking, problem-solving, creativity, and adaptability skills – all essential for career sustainability in an evolving educational landscape where artificial intelligence writing tools are challenging both EFL teacher educators and pre-service teachers today.

Although this study focuses on English language teaching and learning particularly in writing, the findings are beneficial not only for EFL pre-service teachers but also for learners in other subjects since writing skills are fundamental across various disciplines. The results provide insights into enhancing instructional strategies in diverse academic subjects in a more motivating manner, through the *process writing approach*, highlighting the fact that developing effective written communication skills using this approach is essential for learners for their academic and professional success over time.

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Generative AI Robs Students of the Joy of Learning

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Abstract

Rapid developments in the field of Generative AI have caused businesses, educators and politicians to consider how best to accommodate and utilise these new technologies. This article explores the implications of using AI, particularly Large Language Models (LLMs), in the writing process. While accepting that artificial intelligence has many valid and valuable uses in other spheres of human existence, this article argues that using LLMs at any stage of the academic writing process beyond grammar-checking is detrimental to student learning. This article explains the importance of students mastering each stage of the Basic Model of Learning to Write Well (learning, thinking, writing), identifies higher-order thinking as the key objective of education and reminds readers of why learning is one of the most joyful activities a human can experience.

Keywords/key phrases: Generative AI, educational philosophy, learning, academic writing

1. Introduction

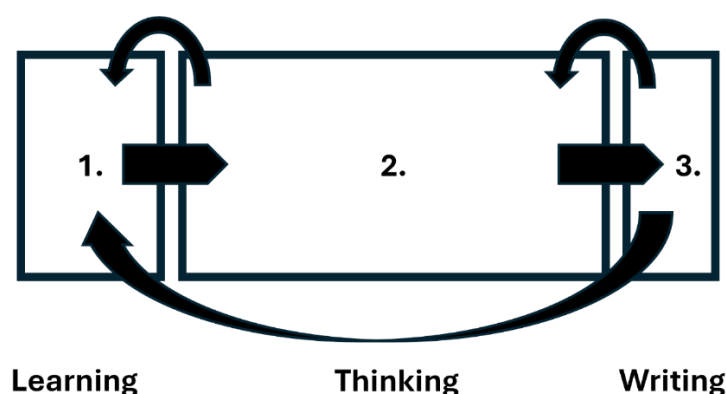
In business and education, Generative AI in the form of large language models (LLMs) such as ChatGPT, Llama 3, or Claude is considered an inevitability to be adopted and adapted to. Across the globe, nation-states are committing to projects that they hope will place their country at the forefront of these emerging technologies. The logic of adoption, that it is better to be on the front foot than compelled to catch up, is built on the presumption that AI will inevitably become ubiquitous. This race to uncritical adoption occurs despite many valid criticisms of Generative AI, particularly LLMs. Widely expressed concerns around LLMs relate to their proneness to inaccuracy (Shi *et al.*, 2025), hallucination (Li *et al.*, 2024), threats to data security (Bellovin, 2024), inbuilt degeneration of training data (Shumailov, 2024), intellectual property theft (Kirchhübel & Brown, 2024), reproduction of racial and gender biases (An *et al.*, 2024) and, most important of all, disastrous environmental impact and contribution to the climate crisis (Ding & Shi, 2024). Without considering these concerns, I wish to add a significant one: Generative AI robs students of the joy of learning. LLMs respond to prompt questions by algorithmically constructing the most statistically likely answer based on their training data (Dixon, 2023). LLMs are, therefore, a markedly different category of software than enabling

technologies such as spelling and grammar checking since the purpose is not to clarify a user's original thoughts but to act as a proxy for original thought. This article contends that the joy of learning is to be found in the process of generating original thought.

2. Basic Model of Learning to Write Well

When I work with students in the initial stages of their academic development, I introduce them to my basic model of learning to write well (Figure 1 below).

FIGURE 1: BASIC MODEL OF LEARNING TO WRITE WELL (2025)



Source: Author's own, 2025

Box 1 represents Learning. This includes listening to lectures, asking questions, reading textbooks and journal articles, watching videos, doing simulations, and engaging in other information input activities. Box 2 is Thinking. As you can see, this is the largest box by a considerable distance. I attribute Box 1 20%, Box 2 70%, and Box 3 10%, not necessarily in terms of time but certainly energy and importance. Which leaves Box 3, Writing. Yes, in my model, only 10% of writing well results from writing. Writing, after all, is merely the expression of thought and thinking, Thinking, I tell my students sincerely, though perhaps pompously, is where the magic happens. There are arrows on the model which demonstrate that this is not a sequential and linear process: when thinking, we may realise there is more to learn; when writing, we may realise our thoughts are not clearly articulated or, perhaps, that there is a significant gap in our understanding. After all, as the great essayist Joan Didion once said, “I write entirely to find out what I’m thinking” (1976, p.2).

The Basic Model of Learning to Write Well is a framework that fosters critical thinking (Chatfield, 2022), deeper learning through meaning-making (Dolmans *et al.*, 2016) and the making of associations (Ash *et al.*, 2012), eventually allowing students to assimilate these insights to existing schema or else accommodate knowledge in a new schema (Plant & Stanton, 2013). Generative AI interrupts this process in damaging ways. The most extreme instance is when students submit work wholly or generated mainly by an LLM, foregoing the three stages in my model altogether. However, this academic misconduct is universally recognised as illegitimate and not what I discuss here. Many argue that LLMs have legitimate academic uses, such as distilling complex information, planning or structuring writing, employing more persuasive language, and synthesising ideas. I contend that employing an LLM for these activities will damage students' engagement with knowledge and rob them of the joy of learning.

3. Using Generative AI in the Writing Process

Let us suppose that I ask students to write a critique of leadership articles written by industry experts. In moments, an LLM could provide a student with a summary, saving the student the ‘effort’ of reading the articles (or, let us be optimistic, of repeatedly re-reading them). This is one of the main tasks for which students could use Generative AI. To test this, I asked the most famous LLM ChatGPT to summarise the key themes emerging from my published journal articles (for ethical reasons, all my work is Open Access, so I was not engaging in nefarious copyright contravention for which ChatGPT has been heavily criticised). While broadly accurate, the resulting output was generic, superficial, and partial. For example, the theme of employability appears in all but one of those articles and even in the title of one, but ChatGPT somehow missed it. One could argue that I do not write well enough to get my point across, but that critique would need to be extended to my co-authors and the peer reviewers and editors involved in each publication. It is much more likely that the LLM output is not of an adequate standard.

This is not to say that artificial intelligence modelling does not have valid and valuable uses. Iterative AI can perform tasks that would otherwise be impossible or immoral, such as modelling the growth of cancerous cells without requiring the condition to go untreated (Beretta *et al.*, 2024), predicting the maintenance requirements of machine tools (Lee *et al.*, 2019), enhancing agricultural efficiency by predicting environmental conditions (Linaza *et al.*, 2021), or optimizing drug delivery to combat infectious diseases (He *et al.*, 2021). Crucially, however, while these tasks can eliminate human weaknesses such as fatigue or distractedness, they are repetitive tasks that do not require cognition. But learning, thinking, and writing, if they are to be done well, do. Returning to our leadership assignment example, even if students wish to earnestly engage in the thinking stage, rather than asking an LLM to synthesise the articles, they will lack the context to critique the source materials effectively. Instead, let us consider a student critiquing Bennis and Thomas's seminal leadership article *Crucibles of Leadership* (2002). Bennis and Thomas argue that people become great leaders by enduring hardships and becoming stronger. Imagine our student reads the sentence, “It is the combination of hardiness and ability to grasp context that, above all, allows a person to not only survive an ordeal, but to learn from it, and to emerge stronger, more engaged, and more committed than ever” (2002, p.8) and is reminded of a documentary about Vietnam War veterans suffering post-traumatic stress disorder (PTSD), and remembers that the negative impacts of trauma may not manifest for several years and often present in unpredictable ways (Bonde *et al.*, 2022). Intrigued, our student returns to the learning phase to read about trauma responses and returns to reconsider the Bennis and Thomas article from a fresh, critical, inter-contextual perspective. Whatever the student writes now, whether it has the appropriate structure and grammatical correctness of an LLM output or not, will be immeasurably more original, more interesting and, quite simply, a better piece of academic work than one in which “the prose style of the output is both bland and uninspiring... characterised by being simplistic, having a lack of evidence... may contain simple errors... [and is] rather soulless” (Dixon, 2023, p.106).

4. Higher-Order Learning

It is worth considering what we hope to achieve in education and contrasting that with the purpose of LLMs. Bloom's taxonomy (Bloom *et al.*, 1956, p.122) dictates that developing higher-order learning means that “what we learn is intended for application to problem

situations in real life.” Synthesising and applying knowledge inherently require the application of novel thought and the making of unpredictable connections. This is the opposite of what LLMs are programmed to do. ChatGPT will produce an algorithmically generated prediction of the most likely response to a prompt based on its training data. In other words, LLMs generate a predictable response that replicates what has gone before. Research that will be presented to the CHI Conference on Human Factors in Computing Systems in April 2025 states that “users with access to GenAI tools produce a less diverse set of outcomes for the same task, compared to those without. This tendency for convergence reflects a lack of personal, contextualised, critical and reflective judgement of AI output” (Lee *et al.*, 2025). Contrast this with the virtuous circle of learning, mastery, positive feedback, and enhanced intrinsic motivation when students apply themselves to a problem and create a solution they understand and can comprehensively articulate.

5. Testing Learning

Given the capacity for LLMs to respond to prompts, it is feasible to frame prompt questions that request responses that test a student’s understanding of a topic they have learned. Ward *et al.* (2024) suggest that LLMs are an effective study aid and can improve academic performance when used in a complementary role, with testing tailored to the student’s current level being a specific example. Prompting an LLM to produce Socratic questions (Paul & Elder, 2019) that guide students to find new ways to express thoughts already elucidated could also be beneficial to test learning. Crucially, in these examples, Generative AI will only effectively support learning that a student has engaged in fully. It is helpful to think of an LLM as a coach for students: an athlete will not become faster if the coach is doing all the work. Much like grammar checking, the intention should be to support and complement rather than interrupt or circumvent the learning, thinking, and writing process. However, given the environmental cost, unethical use of other people’s creative output, and ongoing reliability issues with LLMs, this article does not endorse its usage.

6. Conclusion

This article has explored the deleterious impact of LLM usage on the academic writing process. While uses for LLMs that do not interfere with the learning process may be conceived, they do not add anything to the process that a peer, mentor, fellow student or tutor can already do. All things being considered, using LLMs at any stage of the academic writing process beyond grammar-checking or as a learning test cheapens education, reducing it to little more than a commercial transaction in which the resource-intensive elements are outsourced in the name of efficiency. The recommendation of this article and question for educators when considering the recommendation or use of Generative AI must surely be, ‘Does this replace any part of the learning experience?’ if the answer is yes, then it must be set aside. Education is a transformative act, a path to developing skills, attributes, and understanding, that unconstrained and ill-thought-out use of Generative AI threatens to short-circuit. Learning is one of the most emotionally nourishing activities we can experience as humans, and the only conclusion to be had based on all available evidence is that Generative AI robs students of the joy of learning.

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We Need To Talk About Resilience: The Case for a Pragmatic and Holistic Perspective

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Abstract

This essay offers a pragmatic and holistic perspective of resilience to assist careers and employability professionals in supporting university students and graduates. It examines the evolution of employability models from skills-based to capital-based frameworks, emphasising resilience as a key component of psychological capital. Drawing on the Employability Capital Growth Model (ECGM) and sustainable career theory, the essay critiques simplistic views of resilience grounded in positive psychology, advocating for a more nuanced understanding that considers personal, contextual, and temporal dimensions. Drawing parallels with physical strength-building through weight training, it underscores the importance of progressive challenges, mental fortitude, support systems, consistency, and recovery in developing resilience. These factors provide a practical framework for guiding university students and graduates toward sustainable careers, with an emphasis on health, well-being, and long-term productivity. Resilience, the essay argues, is not about unyielding strength but adaptability and recovery, accounting for external factors and systemic barriers. By integrating principles from weight training into career guidance, careers and employability professionals can offer a balanced view of resilience, equipping students and graduates to navigate contemporary career challenges. This approach bridges career development and employability theories, providing new insights for practice and research in higher education and beyond.

Keywords/key phrases: career development, Employability Capital Growth Model (ECGM), graduate employability, higher education, resilience, sustainable career

1. Introduction

In the mid-to-late 2010s, graduate employability models shifted from skills-based approaches (e.g., Bridgstock, 2009; Dacre Pool & Sewell, 2007; Knight & Yorke, 2004) to more holistic capital-based frameworks (e.g., Clarke, 2018; Donald, 2017; Donald et al., 2019; Tomlinson,

2017). These capital-based approaches emphasise resilience as a critical component of psychological capital, within the HERO framework: Hope, Self-Efficacy, Resilience, and Optimism (Luthans, 2002; Luthans & Youssef-Morgan, 2017).

Luthans (2002) defined resilience as "the capacity to rebound or bounce back from adversity, conflict, failure, or even positive events, progress, and increased responsibility" (p. 702). Originating from the Latin *resilire*, meaning to jump back or recoil, resilience underscores a shift from purely educational development or employment progression to psychological growth within organisations (Luthans & Youssef, 2004). This perspective aligns with frameworks grounded in positive psychology and positive organisational behaviour (Luthans & Youssef-Morgan, 2017).

Recently, Donald, Baruch et al. (2024) introduced the Employability Capital Growth Model (ECGM), encompassing nine forms of employability capital—social, cultural, psychological, personal identity, health, scholastic, market-value, career identity, and economic capital—alongside contextual and temporal factors, leading to various personal outcomes. Their model recognises the limitations of emphasising personal agency alone, acknowledging the interplay of agency and external environments on self-perceived employability that plays out over time (Donald, Baruch et al., 2024; Healy, 2023; Tomlinson, 2017). It also responds to ongoing calls for an integrated perspective that bridges the graduate employability and career development literature (Healy, 2023; Healy, Hammer et al., 2022).

Furthermore, the multidimensional nature of the ECGM addresses critiques such as those by Sultana (2024), who cautioned against framing resilience as a simplistic mindset of uncritical positivity which places the burden of success or failure on individuals alone, attributing systemic failures to individual deficits and promoting an unrealistic heroic notion of resilience.

This essay seeks to highlight the importance of a nuanced understanding of resilience for careers and employability professionals supporting university students and graduates. By incorporating personal, contextual, and temporal dimensions of career sustainability (De Vos et al., 2020), this approach aims to promote health, happiness, and productivity (Van der Heijden, 2005; Van der Heijden & De Vos, 2015). We introduce parallels with weight training to explore resilience within these dimensions and conclude with a call for careers and employability professionals to advocate for a balanced interpretation of resilience.

2. Lessons From Weight Training

The primary goal of weight training is to progressively challenge muscles, resulting in increased strength, power, and endurance. This training fosters physical development and raises metabolic rate, improving overall fitness even at rest. Additionally, weight training supports long-term health by enhancing bone density, joint stability, and proprioception. It can be tailored to individual goals, whether for hypertrophy, strength, performance, general fitness, rehabilitation, or healthy ageing. Parallels exist between building physical strength and developing psychological resilience since both processes involve gradually overcoming challenges and adapting to stress. We now present five examples of what can be learned from weight training.

2.1. Progressive Overload and Growth

In weight training, muscles grow stronger through progressive overload—gradually increasing resistance to stimulate growth. Similarly, resilience develops through exposure to increasing challenges, allowing individuals to strengthen their coping mechanisms. Just as consistent effort in weight training leads to muscle growth over time, regular encounters with manageable stress enhance resilience, enabling individuals to navigate future difficulties more effectively.

2.2. Mental Fortitude and Discipline

Mental toughness and discipline are essential in weight training, helping individuals to persevere through discomfort and achieve their goals. Likewise, resilience involves the mental strength to endure setbacks and persevere. Both processes require focus, motivation, and discipline to continue despite adversity, fostering growth and improvement over time.

2.3. Form and Support

In weight training, proper form is crucial to reduce the risk of injury and achieve optimal results. Similarly, building resilience benefits from external support, such as mentorship, coping strategies, and a strong social network. Just as a personal trainer can refine technique and maximise the benefits of weight training, the right support mechanisms can enhance resilience by helping individuals safely navigate challenges and recover constructively.

2.4. Consistency and Patience

Building physical strength through weight training requires consistency and patience, as progress is gradual and seldom linear. Resilience, too, is built over time through persistent exposure to challenges. Both processes involve setbacks and plateaus, but those who remain patient and committed will ultimately reap long-term rewards in strength—whether physical or emotional.

2.5. Recovery and Adaption

Lifting weights damages and weakens muscles in the short term. It is in the subsequent rest and recovery stage that muscles adapt to grow stronger than they were before. Similarly, resilience requires periods of rest and reflection. Constant adversity without breaks can lead to burnout, just as overtraining can cause injury. The recovery phase is essential for both physical and psychological growth, allowing adaption and long-term development.

3. Applying Weight Training Principles to Career Development

Weight training provides a metaphor for understanding resilience through the personal, contextual, and temporal dimensions of sustainable career theory (De Vos et al., 2020). This approach helps careers and employability professionals guide students and graduates towards a balanced view of resilience, incorporating growth, support, recovery, and adaptability. By adopting this holistic perspective, students and graduates are better equipped for sustainable careers that prioritise the indicators of health, well-being, and productivity across personal, contextual, and temporal dimensions of resilience and career development.

3.1. Personal Dimension

The personal dimension of resilience is influenced by various forms of capital—psychological, social, economic, health, and career identity (Donald, Baruch et al., 2024). Resilience involves more than just psychological traits; it integrates them within contextual factors. For instance, the overarching capital of career identity influences how one proactively navigates professional challenges. A strong social network can enhance resilience by offering support during job loss or enabling easier mobility between jobs, while economic stability can reduce stress by covering financial needs. Health capital is vital, as physical well-being supports career challenges while illness creates the risk of a vicious circle of stress, chronic ill-health, and career disruption.

Similar to how proper equipment and resources enhance weight training effectiveness, robust support systems, economic stability, and good health can strengthen resilience. However, resilience can become detrimental if it means at a personal level pushing through adversity without sufficient recovery time. For example, teachers and nurses face an increased risk of burnout if they persist through demanding conditions—high workloads, lack of breaks, long hours, and emotional investment—without addressing their own need for rest and recovery (Agyapong et al., 2022; Brewer et al., 2019; Dall’Ora et al., 2020).

As previously mentioned, the original meaning of the term resilience was to jump back or recoil, which centres on recovery from stress rather than the absence of it or the stoic refusal to bend in response to it. Thus, resilience should be viewed as the capacity to recover and adapt after being overstretched, not as unyielding strength. This view highlights the need to integrate various forms of employability capital and recognise the importance of recovery in sustaining resilience.

3.2. Contextual Dimension

Context plays a crucial role in shaping resilience and self-perceived employability, often overlooked in traditional approaches that emphasise individual agency. Many critique the responsabilisation of careers, which overemphasises personal merit while blaming failure on individual flaws, disregarding external factors and systemic barriers (Healy, 2023; Sultana, 2024). Such attributions are often misleadingly framed as empowerment, masking structural constraints (Endress, 2015). In the era of Industry 4.0, marked by rapid technological change, graduates encounter significant workplace disruptions (Coetzee, 2023). This landscape demands a broader understanding of resilience that includes external challenges and systemic influences that evolve with time (Pitan & Muller, 2023).

In this context, careers and employability professionals provide crucial personalised support, helping individuals navigate the balance between personal agency and systemic factors (Donald et al., 2019; Healy, 2021). Just as a weight trainer needs to avoid overloading and overuse of muscles to prevent injury, graduates must manage unrealistic expectations to avoid burnout. Careers and employability professionals, akin to personal trainers, play a vital role in guiding graduates through these challenges and promoting sustainable career development (Brewer et al., 2019; Donald, Van der Heijden & Baruch, 2024; Healy, Brown et al., 2022).

3.3. Temporal Dimension

The temporal dimension of resilience illustrates its dynamic and fluctuating nature, much like the progression observed in weight training. For example, Donald and Jackson (2022) found that self-reported resilience among 414 students and recent graduates significantly declined in September 2021, eighteen months into the COVID-19 pandemic, compared to March 2020, just before the initial lockdown and social distancing restrictions in the UK. Specifically, 41.97% (n=115) of students and 48.57% (n=68) of recent graduates reported decreased resilience in September 2021, while only 15.69% (n=43) of students and 16.43% (n=23) of graduates reported increased resilience. The value of this work is evidenced by its inclusion in the World Health Organization's COVID-19 Research Database of impactful research studies related to various aspects of the COVID-19 pandemic [ID: covid-who-1884150].

These findings indicate that resilience is not static but fluctuates over time and among individuals in response to stress. Like weight training, which causes initial muscle soreness and systemic fatigue before strength gains, resilience can temporarily decrease under sustained stress, with growth occurring as individuals recover and adapt. Just as a weight trainer needs rest and fuel to recover and avoid injury, individuals require recovery periods between adversities to build resilience and prevent burnout. Holistic, sustainable, and emancipatory perspectives on careers and employability, such as those advocated by Donald, Van der Heijden, and Manville (2024) and Healy (2023), underscore the importance of integrated career and well-being support in moderating the relationship between employability capital and self-perceived employability, addressing both immediate and long-term resilience needs.

4. Conclusion

In this essay, we highlighted the importance of gradual growth, discipline, support, and recovery, drawing parallels between building physical strength and developing psychological resilience. This approach aligns with the ECGM and sustainable career theory, emphasising personal, contextual, and temporal dimensions in achieving outcomes such as career success and well-being. Our approach also addresses the need for integrating career development theories into graduate employability scholarship and pedagogical practice (Healy, 2023).

For career development professionals, these insights offer a practical framework to help students and graduates build resilience. A key takeaway is promoting a balanced view of resilience that acknowledges external factors and the need for recovery time, moving beyond simplistic heroic narratives of unyielding strength (Sultana, 2024).

Incorporating these principles into career education and support allows careers and employability professionals to adapt resilience strategies to individual circumstances and challenges. This approach is valuable for practice and research, offering a novel perspective on cultivating resilience in higher education and beyond. We encourage further exploration of refining career development models to better align with the evolving demands of contemporary careers and the external pressures faced by today's university students and graduates.

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Effectiveness of European Open Science Policies on Improving Economic Competitiveness

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Abstract

This study evaluates the European Commission's strategy to enhance innovation and competitiveness through the research, innovation and development (R&I&D) sector, with a particular focus on Open Science (OS). Recognising OS as a global megatrend with promising societal impacts, the paper explores its economic implications, which to date remain insufficiently evidenced. The research examines investments made during Horizon 2020 and Horizon Europe, highlighting successes and ongoing challenges, such as the EU's fragmented policy environment, regulatory hurdles, and the underutilisation of research by the private sector. The analysis draws on key findings from the European Innovation Scoreboard and insights from the Letta and Draghi reports, which underscore declining EU competitiveness in the global R&I&D landscape, particularly compared to China and the U.S. The paper identifies critical obstacles, including low industry engagement, the lack of standardised practices, and disparities in member states' capacities and disciplinary differences. Not only does it emphasise the necessity for more effective governance structures, harmonised policies, and investment strategies tailored to industry and end-user needs, but it also highlights the need for new, collaborative skills and readiness to collaborate from all disciplines and stakeholders. Recommendations align with the Budapest Declaration on the New European Competitiveness Deal, advocating for a robust Single Market, improved data integration, and increased private-sector investment. By addressing these barriers, the EU can leverage the R&I&D sector to regain its competitive edge, enhance innovation-driven economic growth, and deliver impactful solutions to societal challenges.

Keywords/key phrases: open science, economy, competitiveness, EU, R&I&D

1. Introduction

Since 2016, Open Science (OS) has been a policy priority of the European Commission, meaning that a significant number of Horizon 2020 and then Horizon Europe projects have been commissioned with a view to building-related capacities, taking OS mainstream, and underlining its importance as well as fostering the development of an international open science community underpinned by an interoperable set of infrastructures based on FAIR (findable, accessible, interoperable, reusable) guiding principles. During the period of Horizon 2020, a sum of 320 million EUR was directly spent from its budget; meanwhile, during the current

programming period of the Multiannual Financial Framework (2021-2027), more than 1 billion EUR is planned to be spent or has been spent directly from the common EU budget while from member states and associated countries the same amount is expected (European Research Executive Agency, 2025; European Commission, 2025) to be invested. The Strategic Research and Innovation Agenda (SRIA) (EOSC Association, 2024) identifies OS as having the positive effects of improved trust in science, quality and productivity gains in research, development of innovative services and products as well as improved impact of research and innovation in addressing societal challenges, supported by a federated, European infrastructure, the European Open Science Cloud (EOSC). The following paper will briefly consider whether OS is the right approach, as well as whether the past few years' significant related investments have delivered expected returns in the light of current competitiveness requests, stemming from the Draghi and Letta reports (Draghi, 2024; Letta, 2024) and the Strategic Research and Innovation Agenda (SRIA) (EOSC Association, 2024).

2. Piloting with slow progress

2.1. Literature review on the impact of Open Science

In the Scoping Review of Open Science Impact (Klebel et al., 2024), where the authors reviewed approximately 30,000 records, they found 479 relevant studies on the impact of open science. Most of the records (311) were found for the academic, then (155) for the societal and only 13 were found to provide evidence for economic impacts. The impact on academics was sometimes controversial due to the variable quality of collected data, predatory publishing practices and article processing charges (APC) that might cause the exclusion of under-resourced regions and institutions but can achieve high-efficiency gains. The outcome of societal impact has more positive underlying evidence according to the studied literature. Plenty of sources suggest positive outcomes in the areas of education, engagement and empowerment of communities in need as well as uptake in policy and decision making. However, there was a significant lack of economic evidence, something that can be viewed as problematic when most policymakers and economic stakeholders are interested in economic cost-benefits.

2.2. The European Innovation capacity

On the other hand, the European Commission issues its European Innovation Scoreboard (EIS) (European Commission, 2024) which indirectly suggests the value added of science to the slowly improving trend of innovation capacity of the EU. The performance improved with a faster pace between 2019 and 2023, resulting in 110 points, compared to 100 in 2017. The picture of the EU remains diverse and unequal due to the diverse policy environments, capacities and investments of different member states. Cyprus and Estonia have been able to improve their innovation index the fastest (by 39% and 27% points respectively), while Denmark, Sweden, Finland and the Netherlands rank as the most innovative EU countries. These latter countries are also global innovation leaders with long-term and predictable strategies and investments. However, a significant number of EU countries, produce only negligible value added through their research, innovation and development activities, a fact which serves to decrease the overall performance of the EU. In the meantime, China has improved its performance by 28%; it has now reached the level of the EU in innovation capacity.

The question, therefore, is whether the EU's overriding focus on open science policy as opposed to emphasising the creation of optimal conditions for all sectors to increase and attract R&I&D investments —particularly from the private sector— is the most effective and efficient way to achieve the ultimate strategic goal: a productive, high value-added, innovative, and competitive economy driven by cross-sectoral and cross-disciplinary collaboration.

Based on the previously listed outcomes, the following EIS indicators are presumed to showcase positive impact in previous years' data: international scientific co-publications, the top 10% most cited publications, employed ICT specialists, public-private co-publication, innovative SMEs collaborating with others, employment in knowledge-intensive activities, PCT patent applications, and trademark applications.

According to these indicators, the answer to this critical question appears to be no. The overall performance of the EU underlines the key messages of the Letta and Draghi reports: the EU's relative weight in the global R&I&D landscape is decreasing and the EC's centralised approach through the European Open Science Cloud (EOSC) so far seems to be ineffective. Not only did China's performance match the performance of the EU overall in 2023 (and it may well have surpassed it by now), but additionally the gaps that exist between the performance of the EU and that of the US, Japan and South Korea remain significant or have even increased. It is important to note that the EU ranks second in terms of providing the most excellent research outputs after the US. Therefore, the potential for improvement can be said to be there, through the available resources, but there is an identified and acknowledged problem of low uptake of research by the private sector.

2.3. Contextual challenges of the EU

While the EU has recognised the problem, significant challenges hinder progress. These include fragmented and diverse policy environments, regulatory and bureaucratic barriers across Member States, which exhibit varying infrastructural capacities, and shortcomings in terms of standardised protocols and practices across disciplines and infrastructures. While the EC aims to coordinate and harmonise policies to improve interoperability, governance complexities arise from conflicting interests among key stakeholders with equal decision-making powers, creating an additional EU-level layer of power struggles. This fragmented governance structure complicates initiatives. Collectively, these issues have brought about an ambiguous environment that is not conducive to the engagement of key stakeholders, such as the industry and the private sector. Another identified problem is the size deficit of European enterprises if we compare the EU to its Chinese or American competitors (Abramo & D'Angelo, 2018; Letta, 2024). The SME sector, especially in the EU context, has a lower risk appetite, which hinders the private funding of research and innovation activities; meanwhile, the EC keeps itself at a distance from direct engagement with large private enterprises in Horizon Europe R&I&D procurements, instead focusing (too) heavily on the involvement of SMEs in such projects, while this sector often lacks the capacity and/or motives to be actively involved (opportunity costs are viewed as problematic for innovation capitalisation). While SMEs undeniably provide the backbone of the EU's economy, the importance of having EU champions – large European companies (like Societas Europea, SE) collaborating with academia – is crucial to attracting global capital. These powerful companies have the most potential to attract global investments to cover capital-intensive endeavours in R&I&D and the development of tomorrow's

infrastructures. In this respect, the EU lags far behind the US (see the just announced 500 billion USD Starlink Project) and China.

Another factor is the differences in cultures not only between countries but between disciplines and industries, an issue that is accompanied by a low level of interest in collaboration within and between quadruple helix stakeholders (academia, government, industry, and societal partners) (Nguyen & Marques, 2022). For improvement to take place, a reassessment of requirements in higher education and research is needed. Transversal, multidisciplinary knowledge and collaborative skills are crucial in the current new context as well as an open and proactive mindset from relevant individuals: the greater the use of inter- and cross-disciplinary research infrastructures by all quadruple helix stakeholders, the stronger the evidence for the need for systemic change.

The European Commission, Member States and other key stakeholders are now building capacities and infrastructures to overcome some key burdens of insufficient data transfer. Recently, EU decision makers also accepted the Budapest Declaration on the New European Competitiveness Deal. They recognised the importance of innovation and the need for private funding to enhance R&I&D. The declaration highlighted the request to build a fully functioning Single Market, build an Investments Union by 2026, reduce administrative burdens for businesses, increase their R&I&D expenditures and enhance digital transformation (European Council, 2024). Based on these acknowledgements, revision of the concept of SEs (European Companies) and their potential to build European champions in R&I&D should be explored.

The EU decision makers have addressed key issues that were raised by both the Letta and Draghi reports. Letta (2024) highlighted the importance of creating a single market for data, through common dataspaces in key sectors and suggested creating the European Knowledge Commons for publicly funded research. It also highlighted the importance of seamless mobility of researchers within the EU and beyond. The alignment of strategies between private and public R&I&D funders was mentioned as crucial. The Draghi (2024) report emphasises the importance of attracting companies and capital globally through competitive regulatory environments that also motivate R&I&D. Current regulatory frameworks create uncertainties for industry players, while fragmentation of policy environments and the lack of possibilities for creating the necessary critical mass in data and capital are key disadvantages of the EU compared to the US (witness the 500 billion USD Starlink project proposal) or China. Large, competitive and innovative companies are the ones that can attract global capital, which is essential if capital-intensive investments into R&I&D activities and the infrastructures of the future are to be covered.

3. Conclusion

The paper set out to evaluate key aspects of the European Commission's strategy for fostering a more innovative and competitive economy through the research, innovation and development (R&I&D) sector, based on related literature. It also aimed to underscore relevant data and evidence in the context of expected outcomes to induce an evidence-based debate amongst related stakeholders. While Open Science has emerged as a global megatrend with the potential for significant societal benefits, its economic impact remains an area in need of further exploration and analysis. The current literature suggests that the EU approach is not as effective in achieving the internally agreed and set objectives as it was intended to be. The industry's

uptake of research outcomes is still low, while regulatory and disciplinary complexities and administrative burdens are hindering progress. Based on the Letta and Draghi reports, the need for revisiting intended drivers of competitiveness and for significantly decreasing hindering factors is in high demand. As the R&I&D sector is one of the keys to finding back the competitive edge of Europe, it is crucial to find a more efficient structure of governance, a more effective way of investments and most of all delivering infrastructures and tools that are in line with industry's, researchers' and overall, the end-users' expectations. There is also a need to revisit European R&I&D strategies and their effectiveness in the current context of global competition towards leading innovation. Based on the paper, closer collaboration, not only within academia between different disciplines, but also with industry, is recommended. Overemphasising the role of SMEs in capital-intensive projects can lead to inefficiencies and ineffective project results with low uptake. Both the literature and empirical evidence suggest that an equal distribution of power on policy and project implementations can also give rise to inefficiency and ineffectiveness due to the leeway it provides for mismanagement (Hudson et al., 2019).

Although the format and space of the current paper are not adequate for a fully in-depth analysis of different indicators and trends, it nonetheless aims to prompt policymakers and related stakeholders to ask themselves questions, based on the aggregated data and policy analysis outlined above.

As a concluding remark, the author's top recommendations would be to ensure a supportive policy and tax environment across the EU to strengthen European companies (and SEs in particular), to enhance and attract R&I&D investments, and to motivate close collaboration between academia and industry, including European multinational companies, from the inception to the implementation and operationalisation of initiatives in this space.

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Paul Delnooz (2025) Research Done Right: A Practical Guide to Social Science Research

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In recent years, the growing emphasis on skill development would be incomplete without recognising the crucial role of well-designed research. It is not self-evident that if we put our mind to research, we can design it well. Often, as emerging researchers, we dive into the process with great enthusiasm, only to realise - after bitter mistakes, rejections, and misguided research plans - that “good” research requires much more than just commitment. The Research Done Right: A Practical Guide to Social Science Research by Paul Delnooz provides a valuable contribution to this journey, offering a comprehensive and creative guide to research design and methodology.

As an educational anthropologist, I have always found that research was always a creative and exciting experience thanks to my supervisors and scholarship opportunities. Designing research does not focus only on data collection and analysis but understanding the circumstances of the examined phenomenon and the whole process management. When I came across Delnooz’ research methods guide Musil’s words came to my mind. “Every man is born with the strength to experience the most immortal sensations. He is not bound by laws. But then life forces him to choose between two possibilities, and he always feels that one is missing, always one, the undiscovered third possibility.” (Musil, 1965, p. 141).

The greatest contribution of Research Done Right lies in its ability to cultivate the skill of discovering this “third possibility.” It offers a fresh perspective on traditional approaches to research and provides insights that are highly relevant to scholars and practitioners across various disciplines.

1. Structure and content

Research Done Right is structured into two volumes with a total of 10 chapters, each focusing on a different aspect of research design. The first volume, comprising the first four chapters, begins with a discussion of research paradigms and challenges commonly accepted assumptions about the research process. As Delnooz states, “There is no set recipe for research. How it is carried out in reality depends on the perspective, knowledge, and, above all, creativity of the researcher” (Delnooz, 2025, p. 8).

Some of the author's assertions may seem provocative, particularly when addressing the practical relevance of researchers' work, but they are invaluable for early-career researchers as they help reveal the "hidden secrets of science." (Delnooz, 2025, p. 5).

The first two chapters lay a strong theoretical foundation, challenging biases and encouraging critical thinking with examples, such as the "stork theory" and the "handbook of torture." These examples help to illustrate the importance of action research and how it connects with broader societal issues, such as women's emancipation. The third chapter offers practical guidance on how to conduct investigations, distinguishing between explanatory and descriptive research. The first volume concludes with a reflection on problem formulation, the selection of definitions, and the "4 W's" technique for gaining a comprehensive understanding of research problems: "In this technique, the issue to be solved is temporarily put on hold. Answers to these four questions are first sought to get the fullest possible picture of the historical and situational context in which the problem or issue arises" (Delnooz, 2025, p. 52).

The second volume of the book is about the techniques for data collection and analysis. In the remaining 6 chapters (Chapter V. to Chapter X.) the operationalisation issue, the cause and effect in research, the types of data collection, interviewing techniques, the sampling theory and basic statistical context are outlined in detail. While these topics are often challenging to explain in an engaging way, Delnooz succeeds by using simple, and sometimes humorous examples. For instance, he describes a 25-year-old woman discussing her fear of men to explain in-depth interviewing (pp. 37-38) and demystifies the Z-table of reliability related to sample size.

One of the book's major strengths is its accessibility. Delnooz simplifies complex concepts and provides creative problem-solving strategies that are easily understandable by both novice researchers and experienced academics. Each chapter begins by raising a research problem, followed by an analysis and real-life examples, and concludes with findings presented in a table format, which makes the research methods practical and applicable. These examples are particularly valuable for readers looking to design research that evaluates skill development initiatives.

2. Key themes and relevance to skill development

Although the book primarily focuses on research methods, its relevance to skill development research is significant. The processes of skill acquisition, retention, and transfer all benefit from well-designed research that captures change over time. Additionally, the sections on mixed-methods research provide valuable insights for those looking to combine quantitative and qualitative data to gain a more holistic view of skill development. Skill learning is influenced by measurable factors (such as time spent practicing) and subjective factors (such as motivation and self-efficacy), and Delnooz offers detailed guidance on integrating these diverse data sources.

3. Areas for improvement

When I conducted research among the international teachers living in Hungary, I had to answer who I am as a researcher and how I position myself—not only for my own understanding but also for my participants and readers (Czók, 2021). While *Research Done Right* offers a thorough exploration of research design, it could benefit from more targeted discussions on researcher reflexivity and self-positioning. Although reflection is mentioned in the book, it is not emphasised, and novice researchers might overlook its importance in the research process.

Another area that could be further developed is the discussion of ethical considerations. While the book mentions research ethics, this section is relatively brief. Given the complexities of conducting research, especially in contexts involving human subjects, greater attention could be paid to issues such as informed consent, data privacy, and the ethical implications of research outcomes.

4. Conclusion

Paul Delnooz has succeeded in creating a book that bridges the gap between theoretical rigour and practical application. For those engaged in social science research, *Research Done Right* provides valuable insights into designing methodologically sound studies that are relevant to real-world learning and development scenarios. As Delnooz himself states, “All told, it is time for a new kind of book. A book which explains both the ‘old’ and the ‘new’ ways of doing research in a balanced and tolerant way. A book which promotes critical thinking, reflection, creativity, and problem solving” (Delnooz, 2025, p. 8). This innovative approach may well be the “undiscovered third possibility” that Musil alludes to.

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