INNOVATION IN EDUCATION FOR DEEPER LEARNING





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Innovation in Education for Deeper Learning

Edited by Stefano Greco & Letizia Cinganotto



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Introduction. **Innovation, Education for Deeper Learning** and Technological Development¹

STEFANO GRECO^{*} AND LETIZIA CINGANOTTO^{**}

Achieving a high level of education is a shared priority for national and international policymakers. On the one hand, favoring the consolidation of an accessible and efficient education system is often considered an ethical goal related to social justice and democratic values (Smith & Colby, 2007). On the other hand, a highly educated population is often associated with development and positive economic performance (Manuelli & Seshadri, 2014; Petrakis & Stamatakis, 2002). Education and educational systems represent a powerful source of success (or failure) for any political community. For these reasons, education policies have to foresee societal changes and challenges, providing a clear and shared long-term vision toward the future of education and the role of educators.

In this framework, the emergence of AI and robotics represents a new challenge for policymakers. The Fifth and Fourth Industrial Revolutions will progressively transform the labor market, leading to technological unemployment and jeopardizing life opportunities for low and middle-skilled workers (Autor, 2015; Hirschi, 2018; McKinsey Global Institute, 2017).

Emerging and developing nations are predicted to be more affected by technological unemployment. This could increase the gap between nations and worsen socio-economic disparities within the communities (Ayentimi & Burgess, 2019; Ivushkina et al., 2021; Lima et al., 2021). Without a comprehensive intervention, the transformation induced by the introduction of new technologies in

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all the productive sectors is likely to desynchronize the training conducted by educational institutions with the actual needs of the labor market.

At the same time, the unintentional socio-economic transformations ascribable to the massification of advanced technologies represent an opportunity for actors and stakeholders interested in revamping education practices. In this scenario, promoting pedagogical strategies capable of fostering deeper learning represents both an ethical and pragmatic commitment to synchronize education with socio-economic transformations.

In the traditional educational setting, students' performances are often equated to the results of the tests, limiting the scope of the schooling system to an assessment based on superficial learning (Kohn, 2011). While superficial learning is restricted to memorizing certain concepts, deeper learning involves a process of reflection and deconstruction (Marton and Säljö, 1976). In this context, deeper learning should be associated with the ability of the learners to develop meaningful and transferable skills (National Research Council, 2012). Multiple studies have demonstrated that the learning process can be transformed to assist students to reach a deeper level of comprehension. Hence, practitioners can opt to switch their teaching methods, promoting deeper learning to generate a beneficial impact on the engaged students (Boulton-Lewis et al. 2001). Nonetheless, these transformations require the active participation and engagement of the scientific community, as well as their close cooperation with public authorities and private stakeholders. Targeted top-down and bottom-up measures should be designed and delivered to achieve this goal. First, the scientific community should support policymakers in defying best practices to foster deeper learning in the educational environment. Then, public and private players should cooperate to pool the financial resources required to train in-service and pre-service teachers to transform the structure of the curricula and organize innovative learning activities. These actions should be combined with informative campaigns to create awareness of 21st century skills and the future of the labor market.

In line with the road ahead, the scope of the volume is to collect ideas, reflections and experiences on deeper learning practices in the education environment. The contributions involve scholars and educators from different disciplines and geographical areas, providing a multidisciplinary and intersectoral overview of deeper learning practices.

The opening chapter presents a study conducted by Stefano Greco on the socio-political consequences of the Fourth and Fifth Industrial Revolutions. Through an extensive literature review, the article aims to detect the impacts of technological innovations and the possible solutions that policymakers, educators and entrepreneurs can implement to mitigate the unintentional socio-economic consequences of artificial intelligence (AI), machine learning and new digital technologies.

The contribution from Letizia Cinganotto and Giorgia Montanucci, presented in the second chapter of the volume, examines the application of AI-based technologies to favor second language acquisition. The chatbot developed at the University for Foreigners of Perugia (Italy) is presented as a case study to demonstrate how AI represents an opportunity to promote personalized language practices and develop immersive conversational scenarios.

The third chapter, presented by Christina Pylonitis and Oliver Meyer, advocates for a re-conceptualization of teaching activities connected with foreign language education. The process of arguing is presented as an innovative learning technique that enhances textual and epistemic fluency, leading to a deeper understanding and empathy among learners.

In the following chapter, the study conducted by Indra Odina and Ilze Mikelsone explores the relationship between reflection practices in teacher education and the enhancement of learners' analytical, critical and creative skills. To achieve this aim, the article introduces Education 5.0, analyzing different reflection strategies and qualitatively investigating whether teaching techniques based on reflection favour deeper learning.

In Chapter 5, Niyati Chitkara, Honey Chitkara and Dolma Pathela conceptualize the multi-perspective teaching methodology as a tool to foster learners' engagement. Inspired by Howard Gardner's Theory of Multiple Intelligences (Gardner, 1983), the multi-perspective methodology is introduced as an innovative learning and assessment approach accommodating different educational needs and cultural settings.

Developed by Wilko Reichwein and Nidhi Waldia, Chapter 6 examines the relationship between deeper learning and internation-

al exposure. Based on the activities promoted in the framework of the Erasmus+ EDUREFORM project, the authors have conducted a perception analysis based on the data collected during the relocation of Indian pre-service teachers in secondary education institutions in Hamburg (Germany).

The volume concludes with a contribution linking technological progress and deeper learning strategies to the necessity of spreading eco-friendly values in society. Through quantitative and qualitative analyses, Jotika Judge and Anna Stavicka investigate how educational practices can foster emotional intelligence, civil activism, and sustainable behaviour in society.

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1.

The Socio-Political Consequences of the Fourth and Fifth Industrial Revolutions

Stefano Greco*

ABSTRACT

The emergence of Society 4.0 is attracting a growing interest from academic and non-academic actors. The new technologies will create a hybrid reality merging the physical and cyberspace, allocating an unprecedented role to technology in the functioning of society. For this reason, technical development is expected to generate multiple domino effects, transforming the market-consumers, employers-employees, and state-citizens relationships. Considering the inadequate attention to the need to rethink society and estimate the socio-political consequences of the Fourth and Fifth Industrial Revolutions, this research aims to obtain a panoramic view of the key socio-economic consequences of technological progress. The objective is to review the existing literature to identify the solutions advanced to mitigate the detrimental effects of the Fifth Industrial Revolution and to define further scope of research in this area.

KEYWORDS: Sustainability; Future studies; Social development; Society 4.0.

Introduction

The Fifth Industrial Revolution, Industry 4.0 and Society 4.0 are terms used to describe the inclusion of artificial intelligence, Internet of Things (IoT), robotics, machine learning, smart automation, metaverse, and big data in society. These technological developments are expected to substantially change human and machine relationships. In the past, workers have operated machines, while in the near future, workers will have to cooperate and dialogue with technological devices. The progression of the Fifth Industrial Revolution will have a deep impact on all aspects of human life. Nonetheless, societal and elites' understanding of the Fifth Industrial Revolution is still marginal compared to the expected socio-political impact. Despite

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the profound socio-economic and political effects of the previous industrial revolutions on how society is organized, the world lacks comprehension and leadership towards the challenges connected with the integration of artificial intelligence, robotics, and other digital technologies into our lives (Schwab, 2017).

So far, the dark side of the Fifth Industrial Revolution has been under-investigated, leading to a scientific dilemma over the sustainability of technical progress (Piccarozzi *et al.*, 2018). Reflecting the public discussion, the socio-political consequences of the Fifth Industrial Revolution have attracted marginal attention in the scientific debate. Most of the research activities have been conducted to develop new technologies. Few studies have detected solutions to the unintentional socio-economic consequences of the Fifth Industrial Revolution. Considering the inadequate attention attracted by the need to rethink and restructure society, this research aims to obtain a panoramic view of the key socio-economic consequences of technological progress. The objective is to review the existing literature to identify the solutions advanced to mitigate the detrimental socio-political effects of the Fifth Industrial Revolution and to define further scope of research in this area.

In the first part, the article briefly introduces the data and the methodology utilized to address the aim and objective of the research. The following section presents a panoramic overview of the socio-economic impact of the Fifth Industrial Revolution on advanced economies and developing countries. Based on the results of the literary review, the article illustrates the solutions proposed for reshaping society vis-à-vis the Society 4.0-led transformations. The study concludes by delivering recommendations and reflections addressed to policymakers and scholars interested in mitigating the unintentional socio-political consequences of technological progress.

1. Data and Methods

A qualitative descriptive review was conducted to address the aim and the objective of the research. Following the recommendations of Mathieu Templier and Guy Paré (2015), the qualitative descriptive review followed these steps: (a) formulation of the research aim and objective; (b) finalization of the exclusion criteria; (c) screening and selection of the relevant literature; (d) extracting data, assessing the scientific validity; (e) critically analyzing and cross-comparing data; and (f) addressing the objective of the research.

The literature screening was performed utilizing Web of Science, Scopus and Google Scholar, searching for the following keywords: Fifth Industrial Revolution, Industry 4.0, Internet of Things, machine learning, robotics, socio-economic impact, socio-economic consequence, economic consequence, social consequence, economic impact, social impact. The research period spanned from January 2015 to October 2023. Grey literature and articles published by predatory journals were excluded from the review. The specialized websites (viz. Beall's List and Predatory Reports) were utilized to identify predatory journals. A qualitative preliminary screening was conducted to exclude publications focusing on technical progress. Moreover, publications involving scholars from all the world regions were purposely included to avoid geographical bias.

At the end of the preliminary review, 81 contributions – 55 articles, 15 book chapters, and 11 conference proceedings – were qualitatively analyzed, compared, and contextualized to the research aim.

2. Understanding the Socio-Economic Impact of the Fifth Industrial Revolution

The Fifth Industrial Revolution and Industry 4.0 will have cross-cutting implications, leading to a domino effect reaching different productive sectors and socio-economic spheres. Technical progress is expected to generate a political, social and economic upheaval, transforming how humans have lived and interacted during the past century (Geschwill & Nieswandt, 2020).

Developing interconnected smart networks, the new technologies will increase the capacity of the companies to design customized services and goods (Dilberoglu *et al.*, 2017; Skryl & Gregorić, 2021; Ślusarczyk, 2018). Industry 4.0 will transform the production chains into micro and digitalized networks of production, capable to quickly re-adapt their outputs to the changes in the market (Agolla, 2018; Chou, 2018; Dilberoglu *et al.*, 2017; Erol *et al.*, 2016; Osei *et al.*, 2020;

Xu *et al.*, 2018). Productivity and global competition are expected to rise, leading to a substantial reshuffling of labor allocation (Aly, 2020; Dilberoglu *et al.*, 2017; Geschwill & Nieswandt, 2020; Pardi, 2019; Wijayanti & Turgel, 2021). Technological replacement will change the way enterprises interact with their customers, creating new dynamics in the service, goods, and labor markets.

The Fifth Industrial Revolution is also expected to have an extensive impact on the financial sector. Firstly, IT companies are expected to enlarge their scope of action, consolidating their privileged role in the stock markets. Furthermore, new technologies are likely to increase the financialization of the economy, contributing to widening the gap between the real economy and stock markets (Chovancová *et al.*, 2018).

Industry 4.0 represents an opportunity for societies de-industrialized following the liberalization of international trade. Indeed, the capillary introduction of new technology is expected to revamp the industrial competitiveness of advanced economies. As reported in a study conducted by Božena Chovancová et al. (2018), societies - having the financial means to transform their productive and service sectors - could operate investments increasing by 40% the labor productivity. In this scenario, a highly skilled labor force acquires an axial role in the companies' capabilities to innovate and integrate new technologies into the production mechanisms (Mahmood & Mubarik, 2020; Pardi, 2019). Companies unable to perform these investments (and adaptations) could disappear, as technologically obsolete compared to their competitors (Frank et al., 2019; Horváth & Szabó, 2019; Petrillo et al., 2018, p. 17). This could be the case for enterprises in emerging economies, exploiting their comparative advantage in terms of labor cost.

Restricting the focus to the manufacturing sector, the introduction of new technologies will integrate the cyber and physical dimensions, placing highly skilled profiles at the center of production processes (Dilberoglu *et al.*, 2017; Horváth & Szabó, 2019; Petrillo *et al.*, 2018). The manufacturing sector is expected to be characterized by the interplay of digital, cyber, and robotics devices directed by factory workers with advanced skills resulting from a prolonged and up-todate education path (Maresova *et al.*, 2018). Similar patterns will be observed in the textile industry. To meet the increasing demand for customization and reduction of costs, textile enterprises will invest in robotics and machine-to-machine communication systems, dismissing a large number of workers in the productive and logistics chains (Geschwill & Nieswandt, 2020; Görçün, 2018). Hence, Industry 4.0 will digitalize, interconnect, and make flexible production mechanisms, shifting the relationship between producers and consumers (Ibarra *et al.*, 2018; Morrar *et al.*, 2017; Pereira & Romero, 2017). The preparedness for technological and productive transformation significantly varies from country to country (Ślusarczyk, 2018). In this scenario, emerging economies are differently prepared for the socio-economic consequences of Industry 4.0. For instance, enterprises in China have begun intensively procuring robots to reduce labor costs, becoming one of the leading economies in robotizing production chains (Beier *et al.*, 2017).

The Fifth Industrial Revolution will also extensively impact the agricultural sector. Farming 4.0 will utilize cyber-physical devices, systems, and equipment to optimize agrarian production (de Alcantara et al., 2021; Lioutas et al., 2019). Along with productivity, the digitalization of the agricultural sector is also expected to increase the safety of the workers and reduce the labor costs. Agrarians and food enterprises will widely deploy computational methods, machine-to-machine communication, Internet of Things, robots, and big data to perform routine tasks (Tzounis et al., 2017). This is expected to diminish the environmental footprint of agricultural activities but, at the same time, reduce the labor demand (de Alcantara et al., 2021; Zambon et al., 2019). As in the manufacturing sector, these transformations are likely to increase the competitiveness of the agricultural enterprises having the financial capability to invest in new technologies, to the detriment of agricultural activities based in underdeveloped areas working with obsolete practices (Barrett & Rose, 2022). Moreover, concerns exist regarding the displacement of rural culture, the resilience of the supply chain, data ownership, and sustainability (Barrett & Rose, 2022). From a sociological point of view, Farming 4.0 is expected to digitalize rural areas, altering traditional farming values and identities (Eastwood et al., 2019). At the same time, the increased productivity of the farming sector is expected to ameliorate the increasing demand for food products from the growing world population and emerging economies, mitigating the risk of malnutrition in the least developed countries.

The radical changes related to the Fifth Industrial Revolution also imply the ability of managers to enhance productivity and at-

tract the necessary investments to operate these transformations. At the micro level, managers will have to integrate smart technologies, conducting a digital and cybernetic revolution of productive processes. In other words, they will have the mission to transform the enterprises, ensuring real-time information flows and end-to-end supply chains (Hofmann & Rüsch, 2017). Besides, human resources managers will be better placed to assess employee performance. As explained in a study conducted by Dóra Horváth and Roland Szabó (2019), the enhanced traceability of performances is likely to increase accountability and individual responsibility of the labor force. Moreover, digitalization of the work floor will ease the transformation of the decision-making processes, devolving tasks into an extended network of physical and cyber resources (Soh & Connolly, 2021). The ramping role allocated to software and algorithms will jeopardize the relationship between employers and employees, challenging the effectiveness of labor union activities (Van Lancker, 2020). At the same time, the smartification of workplaces is expected to affect the gender gap positively. According to the study by Heidi Aly (2020), women are expected to benefit from digital transformation due to increased work flexibility, which will generate opportunities, mostly in developing countries.

Due to the pre-existent automation, availability of resources, and capacity to invest in human capital, these transformations could be smoother in multinational corporations (Horváth & Szabó, 2019). This implies that SMEs must devote considerable resources to the digital transformation of their productive chain and skilled labor force (Serumaga-Zake & Van der Poll, 2021). Mid and large-scale firms in the automotive and electro-technical sectors will have a comparative advantage in successfully operating the structural and human resources transformations required for the upcoming technological transition (Hirsch-Kreinsen, 2016). It is reasonable to expect that SMEs could suffer from losing competitiveness in the domestic and international markets. The massive integration of new devices in mutated production lines will increase the challenges for SMEs, mainly in developing countries (Ayentimi & Burgess, 2019). Based on a study analyzing the attitudes of SMEs in Pakistan, Tarique Mahmood and Muhammad S. Mubarik (2020) remark on the role of Internet of Things, cloud computing and cyber-physical systems in creating an automated and interconnected network of enterprises. These technological innovations

would accelerate the digitalization of business processes, bringing challenges to SMEs based in developing countries. For instance, Vietnamese enterprises are expected to face competitive challenges due to the shortage of investments, highly skilled labor force, and technological awareness (Vuong & Mansori, 2021). This prediction is invalid for SMEs based in advanced economies, having highly skilled human resources, and financial support originating from dedicated governmental programs. Therefore, the technical process could create a dichotomy within the productive sector: Industry 4.0 could represent an insurmountable barrier for SMEs basing their competitiveness on a cheap labor force; and at the same time, it could represent a lever for SMEs with pre-existent know-how and advanced R&D programs. For these enterprises, robotization and deep digitalization could be an opportunity to reduce labor costs, while increasing their capacity to respond quickly to changes in consumer demand (Frank et al., 2019; Horváth & Szabó, 2019; Petrillo et al., 2018). Hence, industrial and intellectual competition is not likely to generate a race to the bottom, advantaging societies and enterprises having the most skilled labor force and advanced technologies (Soh & Connolly, 2021). At the same time, technical progress could increase disparities within societies, as well as between advanced and developing economies (Prettner & Bloom, 2020a).

From a human development perspective, the Fifth Industrial Revolution is likely to bring several challenges related to social sustainability (Roblek et al., 2020; Ragulina et al., 2019). Technological unemployment is one of the most debated socio-economic consequences of Industry 4.0. The econometric study by Hector Sala and Pedro Trivín (2018) demonstrates that technological development will gradually transform the organization and the delivery of labor-intensive tasks. This radical transformation will spotlight new legal, regulatory, behavioral, and psychological issues in the workplace (Demir et al., 2019). Grischa Beier et al. (2017, p. 232) concluded that it is reasonable to expect the emergence of technological unemployment due to the increased automatization in industrialized and developing countries. Whether and to what extent some qualifications will become more or less valuable in future will depend on the velocity (and the extent) companies will invest in the transformation of their production, services, and sales processes (Chou, 2018; Geschwill & Nieswandt, 2020; Maresova et al., 2018, p. 10; Syam & Sharma, 2018;

Zervoudi, 2020). Hence, while the increase in unemployment and socio-economic polarization due to technical progress is highly likely to occur, the timeframe for these disruptive alterations remains unknown. As remarked in a study conducted by Antonella Petrillo *et al.* (2018, p. 16), factories will increase the demand for skilled labor force. Workers conducting routinary activities will be gradually replaced by software, machines, and robots (Autor, 2015; Chou, 2018; Erol *et al.*, 2016; Hirshi, 2018; Lima *et al.*, 2021; Morrar *et al.*, 2017; Wijayanti & Turgel, 2021). In this scenario, enterprises will face severe challenges in scouting qualified staff (Cserháti & Pirisi, 2020; Głuszak, 2023; Kurt, 2019; Poma & Al Shawwa, 2022; Ślusarczyk, 2018).

An analysis conducted by Michael Segal (2018) forecasts that one-fourth of the labor force could lose their current job due to technological development. Technological unemployment could become more impactful in developing countries (Aventimi & Burgess, 2019; Ivushkina et al., 2021; Kurt, 2019; Lima et al., 2021). In the last decade, digitalization has already increased unemployment in Asian countries (Tran et al., 2023). In Indonesia, one of the most populous countries in the world, 56% of the labor market has been considered susceptible to technological unemployment, aggravating poverty in the country (Wijayanti & Turgel, 2021). New devices and technologies will become autonomous, leading to the necessity of having a labor force skilled in supervising digitalized processes (Bikse et al., 2022; Horváth & Szabó, 2019; Petrillo et al., 2018; Zervoudi, 2020). This work of supervision would imply the capability of the workers to cooperate with intelligent machines, leading to a revolution in organizational behavior and management of the workflow (Kosała et al., 2023). Technological unemployment is not expected to be confined to the manufacturing and agricultural sectors. The introduction of new technologies could lead to a gradual disengagement of the labor force in the service sector (Maresova et al., 2018). For instance, the financial sector will likely observe a progressive decline in labor force density (Chovancová et al., 2018). Decreasing job security and stability, workers will have to increase their capability and flexibility to conduct different tasks for multiple employers simultaneously (Geschwill & Nieswandt, 2020; Głuszak, 2023; Hirschi, 2018). These trends could jeopardize the domestic welfare states, increasing societal polarization in terms of working conditions and safety nets (Prettner & Bloom, 2020a; Van Lancker, 2020).

Other uncertainties are expected to emerge. The expansion of Industry 4.0 could have severe consequences for societal security. For instance, the integration of the manufacturing and service sectors with digital technologies brings into the picture risks related to cybersecurity (Chou, 2018; Maynard, 2015; Morrar et al., 2017; Petrillo et al., 2018; Sung, 2018; Tien, 2015; Xu et al., 2018). Andrew D. Maynard (2015, p. 1005) explains that cyber risks increase by orders of magnitude as manufacturing and data become more scattered and less conventionally protectable. Therefore, it is reasonable to expect that companies will have to increase their investments to ensure the impermeability of the productive mechanisms to external threats. These investments would minimize the risk related to the integrity of the productive processes, production outages and intellectual rights protection. Another primary security concern is related to data and privacy. As explained in a study conducted by Changrok Soh and Daniel Connolly (2021), data are collected with precise goals, and the new technologies will increase the power of political and economic elites to profile the population. Big data could be utilized with noble and beneficial goals, such as improving health prevention practices (Aceto et al., 2020; Chou, 2018; Ćwiklicki et al., 2020; Jayanthi et al., 2020); or reducing the occurrence of injuries and fatalities in sectors affected by occupational safety (Badri et al., 2018; Kurt, 2019; Min et al., 2019). At the same time, big data and algorithms could be exploited to operate oppression of minorities and mass surveillance. Furthermore, machine learning and smart systems could magnify the bias existing in the social realm (Soh & Connolly, 2021). For example, machines could uncritically consider certain groups as suspects following societal prejudices. Following these transformations, civil society organizations will have to recalibrate their priorities and strategy vis-à-vis the socio-political impacts of the Fifth Industrial Revolution.

Nonetheless, discriminatory practices disseminated by machines could be only the tip of the iceberg. The growing polarization of opportunities between low and high-skilled individuals will likely aggravate the existing socio-economic and cultural inequalities, creating fertile ground for political instability. Technological unemployment could potentially increase socio-economic and political fractures, revamp domestic and international conflicts, and weaken the financial investment allocated to welfare and environmental policies (Cserháti & Pirisi, 2020; Maynard, 2015).

3. Solutions to the Unintentional Challenges of Technological Progress

In a time characterized by a labor force possessing advanced skills, the ability of policymakers, public institutions and entrepreneurs to enhance human capital will make a difference (Agolla, 2018). As concluded in the analysis conducted by Febry Wijayanti and Irina Turgel (2021), technological advancement will be accompanied by a rampant demand for a skilled labor force. According to the study by Selim Erol *et al.* (2016, p. 18), there is a universal need to rethink competencies in light of new technological developments. Considering the expected future scenario, the challenge is not solely related to changing the content of educational activities but involves a horizontal upscaling of soft and hard skills in society.

For this reason, the educational sector is expected to be the main answer to the unintentional challenges of the Fifth Industrial Revolution. In the literature, there is a consistent call to reframe the educational programs to meet the skill shift occurring in the labor market (Chou, 2018; Filippovskava et al., 2019; Pauceanu et al., 2020; Prettner & Bloom, 2020b; Sung, 2018; Wijayanti & Turgel, 2021). More specifically, since the early socialization stage, the education system should train the students to interact and cooperate with technological devices, establishing placement services linking education and the labor market (Agolla, 2018; Ilori & Ajagunna, 2020; Petrillo et al., 2018; Wijayanti & Turgel, 2021; Zervoudi, 2020). Moreover, education should be reformed, exposing learners to the real work environment, and breaking the silos existing between disciplines, schools, universities, and enterprises (Bikse et al., 2022; Zervoudi, 2020). Industry 4.0 will provide opportunities to workers capable of delivering innovative, creative, and communicative tasks (Bikse et al., 2022; Kosała et al., 2023; Lanza et al., 2015; Soh & Connolly, 2021). For this reason, analytical, creative, digital, linguistic and communication skills should be placed as top priorities, ensuring the early exposure of the learners to technological and innovation-oriented education (Agolla, 2018; Elayyan, 2021; Kiel et al., 2017; Kosała et al., 2023; Petrillo et al., 2018; Ríos et al., 2017).

Investments should be dedicated to re-training the educators employed in primary, secondary and tertiary education. Implementing Education 4.0 implies that the teaching staff would be empowered through advanced vocational training designed to mainstream innovative teaching pedagogies and best practices for utilizing new technologies in the classroom (Shenkoya & Kim, 2023). The STEM approach should be promoted and sustained in the schools, synchronizing the different elements of the educational systems, developing student-centered learning practices, and revolutionizing the traditional concept of education (Elayyan, 2021; Ilori & Ajagunna, 2020; Prettner & Bloom, 2020a; Zervoudi, 2020). Furthermore, the assessment of the students should be subjected to a critical review. Rather than continuing to base the assessment on written and oral exams, education institutions should promote practical and immersive evaluation mechanisms (Bikse *et al.*, 2022; Ilori & Ajagunna, 2020; Pauceanu *et al.*, 2020).

The crucial role allocated to education and training is not merely related to hard skills. As we have seen before, managers should play a pivotal role in adapting society to technological progress. For this reason, training activities dedicated to business and public management should be reshuffled to facilitate the creation of young managers able to deliver new organizational patterns (Gluc, 2023; Postelnicu & Câlea, 2019). Another key social and educational evolution relates to the capacity of societies to innovate the entrepreneurship culture (Bikse et al., 2022). Concrete measures should be taken to minimize the organizational resistance to the transformations, creating managers capable of understanding new technologies and re-adapting the productive processes to the mutated scenario (Liao et al., 2017). Nevertheless, these investments could be hampered by the reticence of middle management - and the labor force fear of losing their job positions - creating an inextricable status of organizational paralysis (Horváth & Szabó, 2019).

These challenges entail the necessity of making education more inclusive, expanding the scope for online learning and open educational platforms (Bikse *et al.*, 2022; Elayyan, 2021; Ilori & Ajagunna, 2020; Maynard, 2015). In addition, public investments should be allocated to engage a larger number of citizens in vocational training, updating the skills of the labor force (Cserháti & Pirisi, 2020; Hirschi, 2018). Technological progress should represent a call to embed social and economic sustainability within the curricula, customizing learning activities and increasing accessibility to tertiary education

(Shenkoya & Kim, 2023). Mostly in developing countries, the major challenge (and solution) relates to (i) the training and re-training of the labor force; and (ii) the mobilization of financial resources to transform the societies (Petrillo et al., 2018). Nonetheless, reshaping educational and vocational training might be insufficient for senior workers and people unwilling (or unable) to comply with the new scenario (Hirschi, 2018; Sung, 2018). New generations are digital natives, accustomed to interacting with digital devices since early childhood. The scenario significantly differs for senior workers, who are more likely to face obstacles in reshaping their professional profile to the mutated labor market. For this reason, the profound changes in the labor market would imply a renovation of career counseling practices. Supplementary investments will be required to develop new counseling practices, starting from a radical transformation of the learning activities dedicated to youths willing to undertake a career in human resource management (Hirschi, 2018).

An important part of the solution is related to the correlation between technological and social progress. The challenge ahead is to ensure that investments dedicated to technical advancement are paired with tangible measures enhancing socio-economic progress (Chekmarev & Bulavko, 2021; Morrar et al., 2017). For this reason, it is crucial to increase resources dedicated to social innovation, nurturing interdisciplinary research teams capable of simultaneously addressing technical and societal challenges. Dedicated funds should be allocated to research institutions for a deeper comprehension of the social impact and sustainability of new technologies (Roblek et al., 2020). Similarly, public and private investments should be allocated to finance research groups investigating how to disseminate in society the new skills required by the labor market; and at the same time, defining strategies for improving societal awareness of the socio-economic impact of the Fifth Industrial Revolution (Pauceanu et al., 2020). In this framework, the reorganization of education should not merely be based on disseminating up-to-date skills in the workforce. Enlarging the perspective, targeted investments in education should nurture human capital. An enhanced human capital would create the precondition to build a knowledge-based society, able to cope with technological and social transformations.

The fusion of the cyber, digital, and social spheres into a single hybrid reality requires societal elites to define new ways to govern

technology and society (Lee et al., 2018; Philbeck & Davis, 2018). Societal elites must define tailored solutions anticipating how the job landscape will change, preparing the new generations to cope with these radical transformations (Alv, 2020; Chou, 2018; Postelnicu & Câlea, 2019, p. 201; Prettner & Bloom, 2020b). To pursue these goals, the public and the private sectors should develop comprehensive development strategies to improve employability, productivity, and skills in society (Mahmood & Mubarik, 2020; Mavnard, 2015). In advanced and developing countries, governments should deliver plans and policies supporting workers exposed to technological unemployment (Tran et al., 2023). These policies should intertwine and coordinate with pragmatic public and private measures enhancing the technological advancement of the productive sectors. Hence, the mitigation of the detrimental socio-political impact of the new technologies should be conducted through governmental strategies paving the way towards economic and social systems capable of quickly adapting to deep socio-economic transformations (Sung, 2018). These policies should operationalize action plans to drive the transition, creating platforms enhancing interdisciplinary and multisectoral cooperation between private and public stakeholders. The effectiveness of these investments would be conditional on the capacity of the policymakers to communicate with their citizens, creating awareness and positive attitudes toward societal transformations (Aly, 2020). In the transnational realm, a further improvement could be embodied in enhancing the cooperation between advanced and developing economies within the deputed international organizations. As suggested by Thi Tran et al. (2023, p. 247), emerging and developing countries should exploit their membership in intergovernmental organizations to learn and exchange experiences in tackling technological unemployment. Considering the impact of technological unemployment on the existing socio-economic disparities, governments should reinforce social and welfare policies targeting less privileged citizens (Mertl & Valenčík, 2016). Multiple scholars (e.g., Lima et al., 2021; Prettner & Bloom, 2020b) consider the reform of the taxation regime, the reduction of working hours, and the universal basic income as measures mitigating the unintentional socio-political effects of the technical progress. For instance, a study by Min Hwa Lee et al. (2018) highlighted the need to create new financial instruments exploiting technological progress to enhance the effectiveness of tax regimes and wealth redistribution.

4. Conclusions

The emergence of Society 4.0 is attracting a growing interest. The literature review confirms the wide economic and social impact of the Fifth Industrial Revolution on advanced economies, emerging nations, and developing countries. The new technologies will create a hybrid reality merging the physical and cyberspace, allocating an unprecedented role to technology in the functioning of society. For this reason, technical development is expected to generate multiple domino effects, transforming the market-consumers, employers-employees, and state-citizens relationships.

Multiple policies and considerable investments will be required to avoid the revival of the political turmoil caused by the Second Industrial Revolution. In this context, technological unemployment, cyber-security, and resilience of the national welfare states appear as the most tangible socio-economic threats arising from this turning point in history. Following the emergence of new entrepreneurial giants – reshaping geoeconomic equilibriums – the world will observe the downsizing of companies currently holding a privileged position in the market. Technical progress will allow new sectoral leaders to emerge, to the detriment of the enterprises (and countries) that are inadequately reacting to the technological revolution.

The level of preparedness toward these transformations remains unclear. What appears clear is that technical progress is likely to increase the gap within societies and between advanced and developing economies. In this regard, it is reasonable to imagine that the augmentation of pre-existing socio-economic fractures will lead to the rise of populism and the birth of new disruptive political ideologies. Therefore, without targeted political and economic corrective measures, the Fifth Industrial Revolution is likely to revamp political turmoil. Nonetheless, learning from past industrial revolutions, societal elites have the possibility to promote measures mitigating the detrimental impact of technical progress. These measures should address the expected consequences, setting concrete targets to mitigate future risks.

Technical progress should be balanced with human development. Investments in new technologies should be paired with public and private programs scaling up human capital. These measures should target youths and workers more exposed to digitalization and robotization of labor. In a scenario characterized by a dearth of qualified workers and the obsolescence of productive systems based on a high density of low-skilled profiles, there is the inescapable need for horizontally upscaling human capabilities. To pursue this goal, significant investments are required to reshuffle the educational and vocational curricula. The mission is to ensure that the new generations – and the people who have already entered the labor market – will acquire adequate skills.

Nonetheless, the solution is not merely confined to the dissemination of new skills in society. Considering the scarce societal comprehension of the socio-economic consequences, awareness campaigns should be conducted to inform citizens regarding the expected mutation of the labor market. Without creating adequate awareness, there is the possibility that the funds invested for training and re-training activities would be ineffective due to the collective underestimation of the challenges ahead. Furthermore, from a politic-electoral perspective, without societal awareness, policymakers would also have limited incentives to finance programs reshaping the labor force and society. Therefore, societal awareness represents an inalienable component of any initiative dedicated to this issue.

In the upcoming years, policymakers will have to create laws regulating the utilization of new technologies. This task will bring several ethical dilemmas, including the possibility of creating coercive limitations for technological advancement. Emerging and developing countries should create regional and transnational alliances for creating financial schemes to support the reconversion of domestic SMEs into decentralized networks of smart production. As a tool of financial sustainability, the international community should create transnational redistributive schemes, creating a platform enabling the flow of resources and technologies from advanced economies to developing countries.

Governments should also exploit the new technologies to innovate public governance. Algorithms and machine learning could be used to optimize public expenditure or conduct advanced investigations tackling tax evasion. The metaverse and digital technologies could also be operated in democratic countries to improve the representativeness of political parties and the effectiveness of public administration. From this perspective, technology is an opportunity to

improve public governance, exploiting digital and cyber technologies to close the gap between the state apparatus and the citizens.

Despite the existence of a vast scientific literature related to the Fifth Industrial Revolution and Industry 4.0, there are still several unanswered questions regarding the mitigation of unintentional socio-political consequences. From a macro perspective, there is a dearth of empirical studies investigating how human capital can be horizontally enhanced within society. In addition, new studies should be conducted to investigate how technological unemployment will financially affect the welfare state, and how societal inequalities will affect the political legitimacy of the ruling elites. These studies would be instrumental in expanding the comprehension of the Fifth Industrial Revolution, placing the development of human capital into a mutated socio-political scenario. Regarding this aspect, the consequences of the Industry 4.0 on international migration remain unknown. Considering that the productive sectors in developing countries are more likely to be negatively affected by technological progress, it is reasonable to expect a rise in immigration towards wealthy countries. Nonetheless, this issue has not yet been addressed by the scientific community.

Furthermore, more studies should be required to comprehend the best practices that education institutions should develop to mitigate technological unemployment. As we saw, education and educators must play a central role in reshaping society and the industry. At the same time, the study conducted provides only normative solutions without narrowing the focus to specific cases. For this reason, new investigations should be undertaken to identify which pedagogical and managerial strategies educators should deploy to mitigate the unintentional consequences of technical progress.

Another gap in the literature concerns the investments required to respond to the upcoming challenges. As we have seen, the public and private sectors should create synergies to operate massive investments to transform the productive sectors and society. Presently, the financial sustainability of these investments remains unknown. In other words, it is unclear if public and private stakeholders will be in a position to mobilize the required financial resources. To address this concern, new research should be promoted to approximate the investments needed, assess the economic sustainability, and advance financial schemes that could be utilized to raise the required funds. Another issue inadequately addressed in the scientific literature relates to cyber-security. To obtain a complete socio-political picture of the Fifth Industrial Revolution, new studies should focus on the socio-political implications of cyber-*insecurity*.

Overall, most of the research activities conducted so far had the final goal of accelerating technological progress. Enormous resources have been allocated for this purpose. Policymakers and research institutes should ensure that these investments are combined with equivalent resources dedicated to horizontally upscaling the human capital. Technological developments must be accompanied by human and social progress. The unbalanced technological development could lead to severe economic, sociological, and political consequences.

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2.

Exploring the Integration of Artificial Intelligence in Online Language Learning: A Case Example on Italian as a Foreign Language¹

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ABSTRACT

This paper examines the application of Al-based technologies in an online Italian language and culture course in a Content and Language Integrated Learning (CLIL) framework, designed for a participant sample of Chinese university students at the University for Foreigners of Perugia, Italy. All AI systems have been trained on a corpus developed by a research group of the University for Foreigners. Dialogue systems enable interactive and personalized language practice opportunities, instant feedback, and immersive conversational scenarios. This case example explores the potential of artificial intelligence in online language learning environments, including discussions of the challenges and opportunities associated with its integration within a broader ongoing research project. The students' comments and reactions to AI will be collected and commented in this contribution.

KEYWORDS: Artificial intelligence; Learning technologies; Chatbot; Online language learning; Dialogue systems.

Introduction

The advancement of language learning through online courses has been significantly aided by the integration of AI-driven chatbots and intelligent tutors. The most promising feature that addresses significant aspects of the language learning process is the adaptability of the learning path based on students' needs and levels. Within a sound

¹ The article was planned and developed collaboratively by the authors. Nevertheless, the writing of introduction and the paragraphs 4 and 5 is attributed to Letizia Cinganotto, while the writing of paragraphs 1, 2, 3 is attributed to Giorgia Montanucci. The Abstract was written jointly by both authors.

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pedagogical framework, implementing AI systems in online courses has the value of augmenting the accessibility of courses, fostering student engagement, and consequently reducing dropouts. Students can access authentic scenarios and interact using communicative functions with chatbots that are constantly available. From this perspective, this study presents an integration of multiple types of AI systems in online Italian language courses at the University for Foreigners of Perugia in collaboration with IUL Telematic University, which include role-play situations and access to faculty documentation and materials, in a CLIL (Content and Language Integrated Learning) perspective. In particular, a research project coordinated by one of the authors, Letizia Cinganotto, is ongoing at University for Foreigners of Perugia and is aimed at integrating the potential of AI into the online courses of Italian language and culture, which are aligned with the Common European Framework of reference for languages, Companion Volume and which represent one of the core missions of the University, as ambassador of Italian language and culture all over the world.

1. The Digital Competence in the European Framework

The development of digital skills is a key focus of the European political agenda, with various materials created to achieve this goal and serve as a reference for those involved in digital skills development. The Digital Competence Framework for Citizens (DigComp 2.2) was one of the first documents to address this issue, emphasizing the importance of digital skills for work and life in Europe. The Union has established programs with political goals, such as reaching at least 80% of the population with basic digital skills and 20 million ICT specialists by 2030. This framework provides recommendations and knowledge for developing policies for citizens' digital skills and establishes a common and agreed-upon vocabulary within a shared terminological and conceptual framework. The definition of digital competence in this document includes information and data literacy, communication and collaboration, media literacy, digital content creation, security, intellectual property issues, problem solving, and critical thinking. This definition highlights the importance of not

just knowing how to use new technological resources but also how to use them critically and consciously. This concept is central to the European document entitled Ethical Guidelines for Educators on the Use of Artificial Intelligence (AI) and Data in Teaching and Learning (European Commission, 2022), which serves as a reference point for education on the benefits and risks of AI usage. This document focuses on systems that process large amounts of data, including sensitive information. It originated from the Digital Education Action Plan, which aims to develop knowledge and resources for the digital transformation of EU education and training systems. A legal framework for AI in high-risk sectors, such as education and professional training, has been established, with mandatory requirements for its use. AI is defined as software that generates outputs based on human-defined objectives using various techniques and approaches. The training of AI tools on large datasets enables them to perform tasks that require human intelligence and reasoning. In educational environments, these datasets often include personal data categorized as education-related data. It is essential for those working in educational environments to integrate these tools into designs that guarantee the privacy and security of sensitive information. The volume of Ethical Guidelines was published following another fundamental document for those involved in education, the European Framework for the Digital Competence of Educators (DigCompEdu), published in 2017. Its objective is «to reflect on existing instruments for educators' digital competence and to synthesize them into a coherent model that would allow educators at all levels of education to comprehensively assess and develop their pedagogical digital competence» (DigCompEdu, p. 13). DigCompEdu identifies three specific areas in which educators' digital competence can bring significant benefits: a dimension related to the professional competence of the educator, a dimension related to the pedagogical competence of the educator, and a final dimension related to the competence of learners. Specifically, it is crucial that teachers' ability to use digital and technological resources makes them operational within collaborative learning, which fosters student autonomy, utilizes their potential for personalized learning, and provides useful feedback in assessment. As the UNESCO Guidance for generative AI in education and research is recommended in the language learning context, GenAI can develop in the role of an individual coach for the self-paced acquisition of foundational skills in

language and arts. An implementation of GenAI within proper pedagogical strategies based on students' needs helps to improve listening, speaking, and writing skills through feedback, corrections, and modeling of the target language (UNESCO, 2023).

2. AI as Artificial Scaffolding for Deeper Language Learning

In recent years, the intersection of language learning and artificial intelligence (AI) has attracted significant attention in educational research. Currently, the emerging concept of AI serving as an artificial scaffolding for deep language learning has led to a paradigm that integrates advanced technological capabilities into the language acquisition process. Drawing from seminal works such as Vygotsky's sociocultural theory and its application to language development as well as the Zone of Proximal Development (ZPD), contemporary research emphasizes the role of AI as a facilitator in guiding learners through linguistic challenges beyond their current proficiency level. This approach aligns with the principles of scaffolding, wherein AI provides tailored support and resources to learners, gradually withdrawing assistance as their language skills evolve. By synthesizing insights from cognitive science, natural language processing, and educational psychology, this approach aims to foster deep language-learning experiences. In Ehrman's (1996) characterization, deep processing involves actively establishing connections with familiar material, exploring relationships within the new content, expanding on the stimulus through associations and its further development, linking novel information with personal experiences, and contemplating alternative interpretations. This process empowers learners to reconstruct their conceptual frameworks actively using newly acquired materials. Deep language learning, a subset of deep learning, has become a focal point in contemporary research by blending linguistic theories with advanced computational methodologies. Pioneering works by authors such as Yoshua Bengio, Geoffrey Hinton, and Yann LeCun have laid the foundation for deep learning, propelling it into the forefront of artificial intelligence (AI) research. Their groundbreaking contributions, including the development of deep neural networks and the

concept of distributed representations, have revolutionized language processing capabilities. In the realm of deep language learning, integration of these principles has led to profound advancements in natural language understanding and generation. Additionally, Christopher Manning's research on deep learning applications in natural language processing has significantly influenced the incorporation of deep learning techniques for language-related tasks. In this framework, the evolution of deep language learning has had a profound impact on shaping the landscape of contemporary AI research in linguistics and language acquisition.

3. The Role of Chatbots in the Context of Language Learning

A chatbot is a dialogue software program or artificial intelligent system that can interact with users through audio or text, in a particular domain or topic, using natural language. Potentially chatbots can be used in a wide variety of ways in instructional situations. Studies, such as Kowalski et al. (2011), assume that chatbots could play a useful role in educational contexts due to their interactive mechanisms compared to traditional e-learning systems. The first chatbot, named Eliza, was created with the intention of acting as a psychotherapist and returning user words as questions (Weizenbaum, 1966). It is renowned for its early application of natural language processing techniques and employed simple pattern-matching algorithms to engage users in conversations. Subsequently, further chatbots were developed, leading to significant advancements that culminated in the creation of various types of chatbot systems and generative Artificial Intelligence systems. In rock the crucial aspects of the introduction of AI-powered technology, especially chatbot systems is the increase of connectivity, efficiency and the reduction of uncertainty in education. They can easily provide a focused, personalized, and result-oriented online learning environment (Cunningham-Nelson et al., 2019) involving the utilization of a chatbot to engage students in natural language interactions, facilitating daily language practice, responding to language learning inquiries, and conducting assessments while offering feedback. Essential to this

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process is the active involvement in dialogues and immersive experiences within language learning environments, both of which play crucial roles in shaping learners' communication competence and language proficiency. Additionally, several studies (Lucas et al., 2014; Frver & Carpenter, 2006) highlighted the potential of chatbots to diminish the shyness that students may feel during language practice compared with talking with a human partner. On the other side, from an assessment perspective, chatbot systems could serve as a viable alternative to make the student evaluation process less anxiety-inducing. When there is no human or human-like agent present in any way, people are more inclined to overcome psychological barriers that could otherwise hinder their responses. Furthermore, chatbots have the potential to diminish the transactional distance between learners and instructors within online learning spaces. Moore's (1993) theory of transactional distance posits the existence of a psychological and communication gap between instructors and learners in online environments, fostering potential misunderstandings. Reducing this transactional distance is likely to enhance learner satisfaction with their educational environment. Chatbots contribute to this reduction by facilitating dialogue through which learners can interact with course content. In the realm of language learning education, educational chatbots serve as tireless assistants, reducing humans from repetitive tasks such as responding to frequently asked questions and sustaining language practice (Fryer et al., 2019). In the realm of online language learning, chatbots serve to fill the often-restricted interaction and practice of the language, both oral and written. They enable the experimentation of acquired linguistic structures, thereby facilitating the consolidation and development of student's proficiency. Numerous studies have been conducted on the efficacy of combining communicative interactions and form-focused instruction in formal language education. Form-focused instruction pertains to any pedagogical practice aimed at drawing students' attention to the form of language, encompassing the phonological, morphosyntactic, lexical, pragmatic, discursive, or orthographic aspects of language (Lightbown & Spada, 1990). Long (1991) delineates a distinction between what he terms «focus on forms,» instruction based on the step-by-step learning of grammar, and «focus on form,» corrective feedback fully integrated into communicative activities. Several studies have compared the effectiveness of second language (L2) teaching in Communicative Language Teaching (CLT) classrooms without focus on form to those with a focus (Lightbown & Spada, 1990; Doughty & Varela, 1998). The results underscore the validity and significance of incorporating focus on form into instruction, which within the realm of online learning can be easily implemented through chatbots providing immediate explanatory feedback. Specifically, the AI-powered University for Foreigners of Perugia and IUL «Riflessione linguistica» feature integrated into the learning path of online courses consistently focuses on form, ensuring instructional effectiveness over an extended duration compared to interventions lacking such focus (Norris & Ortega, 2000). It is crucial to emphasize that students' interlingua undergo gradual modification when errors are highlighted. Indeed, error feedback becomes effective when sustained over an extended period and focuses on topics that students can genuinely comprehend. Therefore, the continual availability of a chatbot calibrated to the learner's level precisely addresses the need for comprehensible and continuous feedback, which is essential for achieving actual improvement in students' language skills (Lightbown, 1991).

4. AI-Powered Online Italian Language and Culture Course: A Case Example at the University for Foreigners of Perugia

The case study which will be described in the following paragraphs, explores how AI can enhance online language learning, which is a current trend in language education. AI is a fast-developing field that offers many benefits to language learners and online language learning environments that engage students and augment their possibilities of language practice, fostering deeper learning.

In reference to deeper learning, new scenarios are open up by the National Research Council (National Research Council, 2012), and the authors would like to mention the following definition of deeper learning by Pellegrino and Hilton:

«We define "deeper learning" as the process through which an individual becomes capable of taking what was learned in one situation and applying it to new situations (i.e., transfer). Through deeper learning (which often involves shared learning and interactions with others in a community), the individual develops expertise in a particular domain of knowledge and/or performance. The product of deeper learning is transferable knowledge, including content knowledge in a domain and knowledge of how, why, and when to apply this».

Deeper learning represents the ultimate goal of the model named PTDL (Pluriliteracies Teaching for Deeper Learning), promoted by the European Centre for Modern Languages of the Council of Europe (Coyle, Meyer, 2021), in which one of the authors, Letizia Cinganotto, is involved as a member of the consultancy team. The model aims at fostering a pluriliterate and plurilingual approach to teaching and learning, embracing a wide range of literacies necessary to meet the challenges of the 21st century, including digital literacy and subject-specific literacy. The final aim is fostering deeper learning, which becomes «visible» when skills, abilities and competences allow the learner to transfer his/her knowledge from known situations into new contexts.

In this framework, feedback is crucial as a scaffolding strategy to facilitate transfer and deeper learning.

The role of constructive feedback has also been strongly highlighted by Hattie (2023), as one of the most powerful tools with a very high impact on deeper learning, fostering meta-cognition and meta-reflection for progressive improvement.

Constructive feedback can represent an important asset in the definition of authentic learning scenarios as defined by the *Common European Framework of Reference for Languages, Companion Volume* (2020). Action-oriented Approach (Piccardo & North, 2019), as highlighted in the *Companion Volume* itself, can really make the difference in planning authentic learning scenarios, enhancing the role of the learner as a social agent in a specific socio-cultural and pragmatic context.

This is the background of the case example described in this contribution, aimed at using AI systems to enhance learning scenarios for Italian as a second or foreign language, providing automatic language feedback to the learner in order to facilitate deeper learning in different situational and interactional contexts.

The study refers to an Italian online language and culture course at the University for Foreigners of Perugia that implements an AI system in the context of Content and Language Integrated Learning (CLIL) (Cinganotto, 2016; 2021), focusing on Italian Art and Heri-

tage. The AI system and chatbots have been trained using linguistic and learning materials aligned with A1-B2 levels (CEFRCV) developed by the University for Foreigners of Perugia. Research, development, and AI system efficacy have been validated by a team of experts specializing in AI and technology, in collaboration with IUL University, but the project is still ongoing as more and more data are needed. The reference framework assumed for the selection of linguistic components and corpus corresponds to levels A1 through B2 for Italian as a second language according to the Profilo della lingua italiana (Spinelli & Parizzi, 2010) and the Common European Framework of Reference for Languages, Companion Volume (Council of Europe, 2020). The course was designed for a sample of Chinese university students. Following in-depth studies that focused on students' proficiency levels and interests, it was deemed a priority to design AI-powered technologies that facilitate the development of communicative skills by structuring role-play scenarios and incorporating an assistant for improved access to faculty documentation and materials. This includes a role-play chatbot concentrating on job interviews simulating a real interaction with an employer, peer-to-peer interaction envisioning a dialogue between a Chinese university student and an Italian student, and a restaurant scenario providing the opportunity to simulate a conversation between a waiter and restaurant patron. This AI implementation promotes sustainable lifelong learning opportunities in alignment with the UN Sustainable Development Goals, specifically Goal 4, recognized as «Quality Education». The targets of Goal 4 emphasize ensuring inclusive and equitable education and fostering effective learning environments that contribute to quality education and overall well-being (United Nations, 2015). The adaptability of AI can enhance both oral communication and written production, thus addressing the limitations frequently encountered in online course settings. The objective of the study was to examine the promising role of Artificial Intelligence in augmenting language learning experiences and outcomes and to collect the students' reactions and comments to the use of an AI-powered tool integrated into the online course of Italian as a foreign language.

In **Figure 1** the homepage of AIDI (Artificial Intelligence for Learning and Dialogue in Italian), the AI machine created and trained by the research group of researchers, PhD students and technologists coordinated by one of the authors, Letizia Cinganotto.

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Figure I. AIDI

4.1. The sample

The sample of this study was made up of 22 Chinese university students (11 at the A2 level of Italian language proficiency and 11 at the B1 level), attending a three-month online course of Italian as a foreign language, within a Memorandum of Understanding between the University for Foreigners of Perugia and Guangzhou Maritime University (GMU) in Canton, China. According to this MoU, GMU students can attend a MA program at University for Foreigners of Perugia and get a double degree qualification, in Italian and in Chinese. The online course of Italian was aimed at improving their language competences before coming to Perugia, as a preparation to the academic language of the subjects of the MA program. In addition to that, they were interested and passionate about Art, as part of their Chinese curriculum at GMU, therefore the online Italian course had been designed with a specific focus on Art, through a devoted section in the platform and related online activities and tasks, named «Pillole d'Arte» (Art Pills), following a CLIL approach. Images, paintings, and masterpieces of Italian art from Perugia and other Italian cities, were presented and discussed with the students in Italian during the online lessons.

4.2. Research Questions and Methods

The study was aimed at finding answers to the following questions: (a) How does the implementation of AI in an online language and culture course impact students' engagement and language practice opportunities? (b) What are the benefits of AI, particularly in terms of interactive and natural dialogues, personalized feedback and guidance, and customized learning paths, in the context of an Italian online language course, according to the students' reactions and comments?

The effectiveness of the training was assessed through extensive experimentation that incorporates both quantitative and qualitative methodologies to examine student interactions with conversational systems. User opinions were gathered via informal interviews and questionnaires, which also assessed participants' awareness of the functioning of the employed AI systems and their effectiveness in terms of achieving objectives within the learning paths.

4.3. Results

From the analysis of students' interactions and qualitative investigations, the effectiveness of implementing AI systems in online learning pathways emerged in terms of augmenting the possibilities to practice language and to promote the achievement of goals and objectives.

In Figure 2 an example of learning scenario related to a conversation between the waiter and the customer, asking for a free table and for the menu of the day.

The activities proposed to the students consisted in a mediated interaction with the chatbots to verify their answers to the questions they had given, as well as a tool to correct sentences and understand the mistakes they have made (including the correct version of the sentence and the number of mistakes).

One of the most promising features introduced was «Immagine» (Image) which allows learners to upload an image and immediately get the description of it. In this context, the feature was implemented within a speaking activity in which students had to describe the image presented and then notice the lacking information in order to integrate with the proper lexicon the previous description they had done. High levels of motivation were identified, and the students were strongly engaged in the activities.

The possibility of enhancing the quantity of the lexicon with the function «Immagine» was perceived by the students as an enhancement of their learning path.

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| | | 0 | Universită per Stranseri di Perugia | WUL |
|------------|---|-----------------------------------|---|--|
| | | Funzio Seleziona attivare u | oni Avanzate a uno strumento dal menu di sinistra per una funzione avanzata | Ciao, letizia.cinganotto@unistrapg.it Crediti disponibil:98 LOCOUT |
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| | Microtono Usa il microfuno per inviare un messaggio | ••• ^{•••} | Grazie: Qual é il menu del giorno? | AI |
| | Immagine (2) (1410) Fori una domanda su antimmagne specifica | • | Pregol II menu del gi con verdure e per de | iorno è pasta alla carbonara, pollo al forno essert abbiamo tiramisù. Ti piace? |
| | having it | and and | | |

Figure 2. Dialogue at the restaurant

Students' opinions showed a great appreciation of the AI scaffolding provided by the feature «Riflessione linguistica» (Focus on form), which covers the finding of mistakes and immediate feedback.

An interesting feature is the possibility to immediately switch the answers from Italian into English, as shown in **Figure 3**. The colors of the national flag in the background of the bubble with the answers refer to the different languages: it is a powerful scaffolding strategy, which can facilitate the understanding and the learning process, exploiting the potential of a bridge language for learners of Italian, such as in the case of the Chinese students.

AI also serves as an added value in CLIL scenarios in Italian as a foreign language, integrating linguistic skills and learning artistic and cultural content.

In **Figure 4** an example of «Art Pills»: the prompt is about «Palazzo Gallenga», in Perugia, where University for Foreigners is located. AIDI will describe it both in Italian and in English according to the B1 level of Italian previously selected.

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| | | | Funzioni Avanzate Seleziona uno strument attivare una funzione av | e to dal menu di sinistra per wanzata | Ciao, letizia.e | cinganotto@unistrapg. Crediti disponibil:9 Locour | it 8 |
| | | | TORNA AL ROLE | PLAY | | | |
| - | A1 A2 B1 | | Scrivi II tuo messag | 990 a A1 | | | |
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| | and Robert | | | | | | |
| | Constant in | 10 | Carl Contraction | | | 100 AL 10 AL 10 AL | |

Figure 3. Code-Switching from Italian into English



Figure 4. «Art Pills»

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4.4. Discussion

The Chinese students had the possibility to practice AIDI during the online lessons of Italian and their reactions were positive and encouraging, as some of their comments, collected through informal interviews show.

The following question was asked:

«What did you find most useful and entertaining?»

These were their most common answers:

- the description of the pictures
- the conversation in the restaurant
- the job interview
- the description of works of art
- the grammar correction
- the questions on the university campus
- the voice dialogue with Artificial Intelligence.

An online questionnaire was also delivered to collect their reactions and the screenshots below show some of their answers.

| Ti piacciono le attività con l'Intelligenza Artificiale? | |
|--|---------|
| Risposta | Media |
| Si | et 100% |
| No | |

Figure 5. «Do you like interacting with AI?»

All the students enjoyed playing with AIDI and had fun.

| Che cosa hai trovato più utile e divertente? | |
|--|----------------------|
| Risposta | Media |
| la descrizione delle immagini | 630000000 50% |
| la conversazione al ristorante | 50% |

Figure 6. «What did you find most useful and fun?»

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They particularly liked working with images and pictures and the role-play at the restaurant.

| Secondo te è utile esercitarsi con l'Intelligenza Artificiale? | | |
|--|--------------|---|
| Risposta | Media | |
| Si | c 100% | 6 |
| No | | |
| Risposte totali al questionario | 1009 | 6 |
| Per quali abilită? | | |
| Risposta | Media | |
| per la scrittura | E 1009 | 6 |
| per la lettura | Gamma 1009 | 6 |
| per il dialogo | 50% | |
| Risposte totali al questionario | 100 % | 6 |

Figure 7. «Is it useful playing with Al? For which skills?»

All the students found useful to play with AIDI, especially to practice and improve writing and reading skills. Dialogue seemed to be less appreciated, probably as part of Chinese cultural preferences and habits: they were particularly reluctant and preferred reading and writing to speaking and interacting during the lessons.

The integration of AI and dialogue systems offered interactive and personalized language practice opportunities, instant feedback, and immersive conversational scenarios. The AI system acted as a reference, tutor, partner, or challenger during the learning process.

The primary aim of this study was to determine the extent to which an immersive AI-mediated approach influences overall student learning effectiveness, and the extent to which students engage with these interaction modalities. The study addressed inclusion, cultural diversity, and specific student needs through the personalization of AI-powered tools that adapt and calibrate content and learners' paths to their levels of proficiency in Italian as a foreign language. The potential of AI within online language learning environments encompasses great opportunities to promote sustained quality interactions and communicative skills in line with the UN Sustainable Goals. Through an examination of learner outcomes, interaction patterns and reactions, this preliminary study aims to be a starting point for larger experimentation into the evolving field of Artificial Intelligence in Italian as a Foreign Language at the University for Foreigners of Perugia.

5. Conclusions

The provisional conclusions of the present case example, which is just a starting point for the wider research conducted at University for Foreigners of Perugia, showed how the connection between AI-enhanced dialogue systems and online courses presents a constructive relationship that acknowledges the essential role of sustainability, inclusivity and accessibility in education. Dialogue systems are crucial in promoting the growth of conversation and interactional skills, which can be difficult to achieve in foreign and second language online courses. By focusing on areas such as cohesion and coherence, sustaining and expanding the topic, handling anaphoric elements, and providing immersive communicative scenarios that resemble real-life situations, AI systems can facilitate comprehensive learning and improve language acquisition outcomes. This innovative approach has the potential to create a more authentic and engaging language-learning experience.

As general conclusions, AIDI had a very positive impact on the students' engagement, entertainment and learning pathway, providing very effective, dynamic, and interactive language practice opportunities which were deemed by the students an added value to the online courses of Italian as a foreign language.

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Arguing for Global Citizenship: Mapping Deeper Learning in the Language-as-Discipline Classroom¹

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ABSTRA

In a recent publication, Meyer & Coyle (2023) propose a new paradigm for language teaching and learning that emphasizes deeper learning and the development of pluriliteracies to foster creative and responsible global citizenship. The authors critique traditional approaches to language instruction and advocate for a re-conceptualisation of the language classroom as a space for (inter-)disciplinary learning that integrates languages, cultures, and literatures. This approach aims to enhance textual and epistemic fluency, leading to a deeper understanding and empathy among learners. In this context, arguing plays a central role. In this article we will elaborate on these ideas. Based on a review of current research, we will suggest ways of rethinking and expanding the role of arguing to align with the demands of foreign language education in a bost-truth world.

KEYWORDS: Deeper learning; Arguing; Global citizenship; Pluriliteracies; Language learning.

Introduction

In her latest article, Kramsch (2022) offers a compelling case for rethinking foreign language education, particularly in light of the COVID-19 pandemic's impact. She identifies a number of ways in which our understanding of language has shifted dramatically. Kramsch (2022) contends that speech communities have not only

¹ Christina Pylonitis and Oliver Meyer have equally contributed to the conception, drafting, and revision of all chapters of the article. Christina Pylonitis initiated the conceptualization of a third interconnected axis within the model of Deeper Learning Ecologies for Global Citizenship (see Figure 3), which was subsequently pursued and developed collaboratively by all authors. All authors have read, reviewed, and approved the final manuscript.

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become more multilingual and multicultural but also more fragmented. This shift has accentuated the distinction between linguistic signs and the concepts they denote, as well as the social realities they reflect. Moreover, the function of language has evolved, shifting from representational to more instrumental uses. In everyday life, the emotive, conative, and poetic functions of language are increasingly favored over the traditional referential, metalinguistic, and phatic functions, which continue to prevail in language classrooms. Communication has become more multimodal, with language and social realities closely intertwined, as seen in the use of slogans, jargon, and «woke» expressions that reflect current social trends. Kramsch (2022) asserts that accommodating these shifts necessitates a fundamental re-evaluation of the core goals of language education:

As we try to imagine a post-COVID-19 FL education, we have to be mindful that the post-corona challenge is not only to make foreign language learners proficient or competent in using foreign ways of speaking and writing, but rather to implicate them in the lives of others who don't speak and don't think like them, who don't see the world like them and yet on whom they depend and to whom they are answerable (Kramsch, 2022, p. 31).

Despite its contested nature, Critical Global Citizenship Education (GCE) stands out as the pedagogic approach that most closely aligns with these ideals and principles. As a multidimensional-construct, GCE intends:

[...] to empower learners to engage and assume active roles locally, nationally and globally, to face and resolve global challenges and ultimately to become proactive contributors to a more just, peaceful, tolerant, inclusive secure and sustainable world (UNESCO, 2018, p. 6.).

GCE highlights «social justice, multiculturalism, critical awareness of global power imbalances and its belief in the transformational power of education» (Starkey, 2022, p. 72).

| Core Conceptual Dimensions of Global Citizenship Education | | |
|--|---|--|
| Cognitive | To acquire knowledge, understanding and critical thinking about global, regional, national, and local issues and the interconnected- ness and interdependency of different countries and populations. | |
| Socio- Emotional | To have a sense of belonging to a common humanity, sharing values and responsibilities, empathy, solidarity, and respect for differences and diversity. | |
| Behavioral | To act effectively, and responsibly at local, national, and global levels for a more peaceful and sustainable world. | |

 Table I. Core Conceptual Dimensions of Global Citizenship Education (Based on UNESCO, 2018)

Meyer & Coyle (2023) propose a new paradigm for foreign language education that revolves around the concept of deeper learning and the development of pluriliteracies to foster global citizenship. The authors critique traditional approaches to language instruction and advocate for a re-conceptualisation of the language classroom as a space for (inter-)disciplinary learning that integrates languages, cultures, and literatures. This approach aims to enhance textual and epistemic fluency, leading to deeper understanding and empathy among learners. The authors emphasize the need for language teachers to become disciplinary specialists and outline strategies for recalibrating the components of language education to align with the demands and challenges of a post-truth world.

Arguing¹ is central to this new paradigm of language teaching and learning because it is seen as fundamental to the development of disciplinary literacies and the promotion of deeper learning. According to Polias (2016) arguing science is one of the four major activity domains or macro-genres which learners need to master in order to become literate in science. Goldman *et al.*'s study (2016), which places literature inside a disciplinary framework, follows a similar line of thought. Their conceptual framework encompasses three disciplines

¹ For consistency reasons, will use the term «arguing» as we want to emphasize the process of arguing for global citizenship and within deeper learning rather than focusing on arguing-related learning products, e.g. argumentative essays, or the composition of single arguments.

(mathematics, sciences, and literature) and focuses on reasoning and argumentation as fundamental to learning in any discipline. This realigns the analysis of literary texts with other academic disciplines, providing opportunities for learners to enhance their literacy skills, such as reading and reasoning, as their language proficiency advances. Meyer & Coyle (2023) assert that this realignment is fundamental to reconceptualizing language learning as a discipline. They posit that transforming the language classroom into a disciplinary learning environment involves learning to read and reason or argue through a wide range of nonfictional and fictional texts. This approach encompasses multiple languages and shifts from a single-text model to a multi-text model.

In this article we will elaborate on these ideas. Based on a review of current research, we will suggest ways of rethinking and expanding the role of arguing to align with the demands of foreign language education in a post-truth world.

1. Arguing for Global Citizenship in the EFL Classroom

1.1. Literature Review: Arguing in the English Language Classroom

Numerous studies agree that arguing plays a significant role in all areas of life including educational settings where arguing is used for multiple purposes.

Goldman *et al.* (2016) emphasise the fundamental role of arguing for the development of disciplinary literacies, highlighting its importance in scientific advancement. They align with Osborne (2010), who posits that progress in science is not merely a product of data collection but is significantly driven by the critical processes of debating and arguing. Polias (2016) underscores the vital role of arguing in fostering scientific understanding in educational settings. He considers arguing a pivotal «cognitive activity domain» that learners must master as they navigate the knowledge pathway within a discipline, transitioning from novices to experts. Iordanou (2016) highlights the positive impact of arguing on the development of epistemic understanding. She argues that by engaging in critical arguing processes, learners may achieve an advanced level of comprehension which was coined «evaluativist epistemological understanding» by Kuhn, Cheney & Weinstock (2000, pp. 311, 325; Iordanou, 2016, p. 118). In other words, honing their argumentative competencies will aid learners to become more adept at evaluating their own knowledge.

Research indicates that the majority of students possess a foundational understanding of argumentation (McCann, 1989; Ferretti, MacArthur & Dowdy, 2000). Similarly, Liu & Stapleton (2020) assert that most learners are capable of critical thinking and employing multifaceted arguments from an early age, a finding supported by Nussbaum & Kardash (2005).

However, multiple concerns have been raised concerning arguing in language classrooms. Ferretti & Graham (2019), Stapleton & Wu (2015), and Perdana *et al.* (2020) report that learners struggle to produce well-crafted arguments. Numerous studies, including those by Qin & Karabacak (2010) and Nussbaum & Kardash (2005), indicate that the low quality of argumentative writing stems from learners' challenge in examining topics from multiple perspectives. This is important because Qin & Karabacak (2010) consistently report a positive correlation between argument quality and multiperspectivity in argumentation.

Studies suggest that curriculum design, educational framing and method of instruction have a significant impact on quality in argumentative writing. Nussbaum & Kardash (2005) observe that in educational settings «persuasion goals reduce counterargumentation» (p. 164) and often lead to biased arguing where winning becomes the primary objective. They further contend that this bias, known as «myside bias», will not only negatively impact the entire process of argumentation but will also affect learners' social and emotional well-being (Nussbaum & Kardash, 2005). Andriessen & Baker (2022) also identify cultural differences among learners as a barrier to adopting multi-perspectival arguments.

Nonetheless, Knoblauch (2011) notes that most textbooks continue to emphasize persuasive strategies and predominantly incorporate Toulmin's model of argumentation (1958; 2003). We concur with Andriessen & Baker's (2022) assertion that the model's focus on persuasion might be the key reason it falls short in enhancing learners' argumentative skills.

However, studies also reveal that targeted teaching strategies can significantly improve the quality of written arguments. Hyland (1990) proposes blending structural elements with genre-based writing techniques to aid learners in their writing process. He claims that this enables them to focus on the quality of their argumentative content, understanding the genre's structure, and developing their research skills (Hyland, 1990, p. 76). In addition, the overall quality of argumentation can be greatly enhanced through teacher scaffolding (Liu & Stapleton, 2020), «specific goal instructions» (Nussbaum & Kardash, 2005, p. 161) and «collaborative argumentation» (Andriessen & Baker, 2022, p. 442; Schwarz & Baker, 2017).

Given these insights, we advocate for a fundamental re-evaluation of how argumentation should be taught in educational contexts. An effective pedagogy should emphasize multiperspectivity, critical thinking, bias awareness, and the cultivation of democratic values. In the next chapter, we will present an approach to arguing that aligns with empirical research and responds to contemporary calls for transformative education.

1.2. Arguing and Global Citizenship

The Organization for Economic Co-operation and Development's (OECD) Global Competence Framework (2018) delineates the significance of arguing in fostering global citizenship:

Globally competent individuals can examine local, global and intercultural issues, understand and appreciate different perspectives and world views, interact successfully and respectfully with others, and take responsible action toward sustainability and collective well-being (OECD, 2018, p. 4).

According to the Council of Europe (2016), global citizenship in democratic contexts requires a wide array of «values, attitudes, skills, and knowledge and critical understanding» (CoE, 2016, p. 35). More specifically, this calls for «cooperation», «conflict-resolution skills», «respect» and «openness to cultural otherness» as well as «tolerance of ambiguity» (CoE, 2016, p. 35).

These qualities all imply the careful consideration and weighing of multiple perspectives as well as the necessity to overcome my-side bias and thus coincide with the goals of teaching argumentation. Therefore, we posit that learning how to argue is quintessential to the development of global citizenship.

This is in line with Kramsch (2022) who argues that it is fundamental for learners to «engage in multiple meaning-making systems and subjectives within a critical pedagogy that strives for social justice and a linguistic human rights agenda» (pp. 27-28). In order to do so, they need to develop and practice «empathy» (p. 37) and «epistemological decentering» (p. 34). Kramsch defines empathy, a concept she situates within social anthropology, as «the willingness to step out of one's usual way of feeling, reasoning and talking about things and enter "someone else's problem" – and to understand what makes it a "problem" for that particular person in the first place» (p. 33).

Epistemological decentering aims at helping learners understand the discrepancy between what they take for granted and what others take for granted. A decentered self will «focus not only on what is said, but also on the silences, the prior knowledges and pre-conceived ideas that remain unsaid because they are thought outside one's own way of thinking – beyond words» (p. 34). For Kramsch, developing empathy through epistemological decentering and reflexive practices is a cornerstone of a revised paradigm for language teaching and learning that centers on global citizenship.

Meyer & Coyle (2023) highlight the critical role of *epistemic fluency*, which they define as «the learners' ability to successfully navigate, relate, argue, bridge, or agree to disagree with the epistemological positions that inform or are represented by texts, thereby avoiding epistemological conflicts and misunderstandings» (p. 247). They contend that for the language classroom to evolve into an environment conducive to global citizenship, it must not only encourage the discussion of global challenges and controversial topics from diverse viewpoints – enhancing a deeper comprehension of these intricate and culturally sensitive issues – but also foster an understanding among learners of how language shapes discourse and influences audiences.

This requires a shared vision of language-as-discipline, involving a shift in how the language classroom is conceptualized epistemically. It also calls for a recalibration of its subdisciplines – language, culture, and literature – to match this vision, supported by teaching approaches that align with these changes.

Meyer & Coyle (2023) propose that moving towards pluriliteracies will put the language-as-discipline classroom in an ideal position to promote global citizenship:



Figure 1. Pluriliteracies for Global Citizenship (Meyer & Coyle, 2023, p. 249)

In this article we take the position that within Pluriliteracies for Global Citizenship (PGC), argumentation is central to the development of *empathy* and *epistemic fluency*.

In the PTDL model (Coyle & Meyer, 2021, p. 78; Graz Group, 2015), pluriliteracies development emerges from the foundational concept of deeper learning, which serves dual roles as both a process and an outcome. As a process, it unfolds through learners' active engagement in linking two key continua: the conceptualizing and the communication continua. This engagement manifests in the exploration of four principal knowledge domains within any subject or discipline: doing, organizing, explaining, and arguing (Cof-

fin, 2006; Polias, 2016; Veel, 1997; Christie & Derewianka, 2008). Such engagement fosters pluriliteracies development in two ways: by growing learners' command of subject-specific knowledge (factual, conceptual, procedural, strategic, epistemic); and by enabling them to language their growing conceptual understanding adequately in appropriate styles and genres tailored to the communicative purpose across diverse modes. As an outcome, deeper learning facilitates the acquisition of transferable knowledge, underscoring its significance for lifelong learning:



Figure 2. Connecting the Two Axes of the PTDL Model (Graz Group, 2015; Coyle & Meyer, 2021, p. 78)

However, we believe that the model in its current iteration falls short of visualizing the role which we assign the process of argumentation in the development of global citizenship in the language-as-discipline classroom. This is because in contemporary discourse, arguing is predominantly viewed as an epistemic activity, thereby neglecting the «socio-relational and emotional aspects» (Andriessen & Baker, 2022, p. 422) that influence individual arguers. In the current post-pandem-

ic or post-truth era, the problematic influence of «filter bubbles» and «echo chamber effects» poses an increasing threat to democratic institutions. This situation underscores the urgent need for heightened awareness and targeted pedagogic interventions to counteract these effects. Echoing Kramsch (2022), we believe that one of the main goals of global citizenship education is to engage learners in understanding and connecting with those whose perspectives, languages, and worldviews differ from their own, acknowledging the interdependence and accountability that bind us all together. We have argued so far that the unique contribution to GCE that the language-as-discipline classroom has to offer is to develop textual fluency, cultural consciousness, empathy, and epistemic fluency. In order to accommodate for these goals, we found it necessary to add an additional axis to the model to highlight the importance of establishing deep connections with other people when arguing for global citizenship.

We call this third axis the *connecting* axis (Figure 3). It is composed of four key components, namely *values*, *attitudes*, *empathy*, and *compassion towards oneself and others*.



Figure 3. Deeper Learning Ecologies for Global Citizenship

Values

The Council of Europe defines values as «general beliefs that individuals hold about desirable goals that should be striven for in life. They motivate action and they also serve as guiding principles for deciding how to act» (CoE, 2018, p. 38). Among these, «valuing human dignity and human rights» stands out as particularly significant in advocating for global citizenship and fostering connections (CoE, 2018, p. 39). Even, or perhaps especially, in heated arguments and controversial discussions, it is essential for learners to uphold respectful dialogue and view their counterparts as equals. Incorporating these values of respect and equality is what lays the foundation for «mutual communication» (Rogers, 1952, p. 88), a cornerstone for fostering meaningful relationships. Furthermore, by embracing these values, individuals are better equipped to promote the «peaceful resolution of conflicts and disputes» through constructive dialogue (CoE, 2018, p. 41).

Attitudes

Attitudes, defined by the Council of Europe (2018) as «an overall mental orientation adopted by an individual towards someone or something» (p. 41), are equally crucial in forging connections. Learners might face difficulties in aligning their values, attitudes, and epistemic beliefs, often due to ingrained biases and socialization (Andriessen & Baker, 2022; Nussbaum & Kardash, 2005). Despite these challenges, the Council of Europe (2018) emphasizes the crucial role of values and attitudes in nurturing democratic citizenship and advocates for the cultivation of such democratic competencies. Therefore, to establish meaningful connections, learners must critically examine their own and others' values, attitudes, and beliefs (CoE, 2016; OECD, 2018; Andriessen & Baker, 2022). This process entails, among others, cultivating an «openness to cultural otherness» and a «tolerance of ambiguity» (CoE, 2018, pp. 39, 41), essential traits for navigating diverse perspectives and uncertainties.

Empathy

Fostering connections with others involves the development of «empathic understanding» (Rogers, 1967b, p. 54; 1967c, p. 92; Young, Becker & Pike, 1970, p. 275). Davis (1983) emphasizes the multidi-

mensionality of empathy in research. While various definitions of empathy exist (Cuff, Brown, Taylor & Howat, 2016; Hodges & Myers, 2007), many scholars adopt a categorization into two primary domains: cognitive and affective empathy (Zaki, Bolger & Ochsner, 2008, p. 399; Hodges & Myers, 2007; Ratka, 2018, p. 1140).

Goleman (2011, p. 13; 2017, p. 8) further distinguishes three types of empathy: «cognitive empathy, emotional empathy, and empathic concern». Cognitive empathy, as defined by Goleman (2017), refers to «the ability to understand another person's perspective» (p. 8), or the ability to walk in somebody else's problem (Kramsch, 2022). Goleman's, Rogers', and Kramsch's ideas of cognitive empathy align, stressing the importance of understanding others' perspectives without experiencing their emotions (Goleman, 2017; Rogers, 1967b; Kramsch, 2022; Hodges & Myers, 2007, p. 296).

Investigations into empathy provide insights into connecting and interacting with others. Researchers link perspective-taking to empathic phenomena (Lamm, Batson & Decety, 2007; Hodges & Myers, 2007), advocate for «adopting an interpersonal perspective on empathic processes» (Zaki *et al.*, 2008, p. 403), and underscore the relationship between empathy and problem solving (Main, Paxton & Dall, 2016; Main *et al.*, 2017). Specifically, they posit that «*mutual* empathic communication [...] is an important feature of successful conflict management» (Main *et al.*, 2017, p. 363; Main *et al.*, 2016).

In line with the Council of Europe (2018), which identifies empathy as fundamental prerequisite for multiperspectivity (p. 75) – essential in cultivating democratic competences –, we regard cognitive empathy as vital for connecting with others through arguing.

Compassion (to Self and Other)

Compassion, as Goetz *et al.* (2010, p. 351) describe, is «the feeling that arises when witnessing another's suffering and that motivate a subsequent desire to help». This sentiment is closely linked to a sense of interconnectedness with others, which is fundamental to the concept of compassion. Ekman (2010) introduces the notion of «global compassion», advocating for a form of compassion that extends to all individuals, including strangers. Expanding on this, Walker (2013; 2018) promotes «3D compassion», which she believes is of «paramount importance to our future well-being and existence as a global

society» (Walker, 2013; Stanford, n.d.), encompassing peace, environmental sustainability, and health.

The relationship between compassion and empathy, particularly empathic concern, has been explored in the context of self-compassion. Studies by Fuochi, Veneziani & Voci (2018), Neff (2023), and Neff & Pommier (2013) have highlighted the connections between these emotional states and the ability to adopt the perspectives of others. According to Lathren, Rao & Bluth (2021), compassion significantly influences various types of interpersonal relationships. Self-compassion, in particular, has been shown by Yarnell & Neff (2013) to be beneficial in resolving conflicts and facilitating compromise, emphasizing the importance of balancing personal needs with those of others. Neff (2023) underscores the importance of self-compassion in forming deep connections with others, stating: «Far from being selfish, giving oneself compassion provides the emotional resources needed to care for others» (Neff, 2023, p. 203). The author also draws attention to the relationship between self-compassion, a growth mindset, self-efficacy, as well as mental health benefits, suggesting that self-compassion can offer resilience in the face of anxiety or depression. Moreover, Neff (2023) points out that self-compassion can be taught and developed.

Interdependence of Growth Areas

Meaning making and language understanding are vital processes of deeper learning (Coyle & Meyer, 2021). However, knowledge can only be communicated successfully if sender and recipient connect. This is especially important when communicating across cultures and languages. Therefore, both axes (communicating and connecting) have to be interconnected.

Advancing along the *communicating continuum* not only requires learners to harness their empathic understanding but also to develop skills to *«regulate* the emotions» (Andriessen & Baker, 2022, p. 437) and by engaging in decentering activities through reflective practice (Kramsch, 2022).

Furthermore, the interplay between the conceptualizing axis and connecting axis underscores the urgency for a revised approach to arguing. This revision encompasses empathic-democratic methods of argumentation, as suggested by Rogers (1952; 1967a-c) and Young

et al. (1970), and challenges the limitations of arguing schemes criticized by Andriessen & Baker (2022) for being «exclusively epistemic» (p. 442) and not fully aligning with democratic discourse objectives.

In the language-as-discipline classroom, deeper learning becomes a reality when teachers and learners engage in learning partnerships to conceptualize, communicate, and connect with each other in profound ways to understand and argue global issues, translating their insights into local actions that address these imperatives.

2. Arguing for Global Citizenship: Strategies and Principles for Teaching and Learning

Drawing on insights from the broader field of learning sciences, Andriessen & Baker (2022) highlight five key ways in which argumentation can facilitate deeper learning across various content subjects. Firstly, engaging in argumentative discourse can lead learners to reconsider their viewpoints, fostering a more nuanced and comprehensive understanding of specific topics. Secondly, argumentation can spark conceptual shifts and drive conceptual change, assisting learners in distinguishing between or redefining concepts. Thirdly, argumentation encourages learners to articulate and justify their thoughts, making their knowledge and cognitive structures more transparent and promoting reflection. Fourthly, the need to present precise questions and statements in argumentation helps enhance literacy skills. Lastly, collaborative argumentation provides a rich environment for learners to jointly construct new knowledge, thereby scaffolding learning.

Foreign language education significantly contributes to all of these goals. However, we concur that arguing in the language-as-literacy classroom, with its explicit focus on empathy and epistemic fluency, offers a unique contribution to learners' plurilingual repertoire beyond these established benefits. This is because arguing in the language-as-literacy classroom transcends disciplinary boundaries and includes fictional and non-fictional texts to activate cultural-consciousness.

First, it can substantially increase learners' textual fluency in an additional language and thus empower them to critically navigate a broad range of plurimodal texts and text types. Second, an explicit emphasis on cultural consciousness provides educators with the

opportunity to place contemporary issues such as poverty and social justice at the top of the classroom agenda by embracing an openness around the decolonization of the curriculum, the dominance of western white politics, and global urgencies around the planet, energy, and technology, all of which have been deemed too sensitive or politically charged for classroom discussion. Third, learning to explain and argue such highly complex, contentious, and culturally charged issues from multiple perspectives and sources will open pathways for deeper understanding not only of the underlying concepts but also of how language is used to shape those discourses and to affect the audience. Moreover, encouraging students to explore imaginary worlds, to engage in creative discourse and to weave together semiotic resources is fundamental to developing learner identity and sense of wellbeing and belonging (Jewitt, 2008). Such an understanding is key for educating for emotional decentering and empathy. This will reposition language teachers as powerful change agents and transform the language classroom into a hub for responsible global citizenship (Meyer & Coyle 2023, pp. 248-249).

We would like to conclude this article by suggesting a number of strategies to help practitioners put these ideas into practice.

Aim for a Deeper Understanding of the Topic

Understanding is a highly individual process that depends on various factors, such as learners' prior knowledge, their strategic competence or motivation and engagement, and their own identities and discourses. It is essential to recognize that achieving a more comprehensive understanding of complex issues in a foreign language involves considering multiple facets. These include key concepts, vocabulary/lexis, linguistic features, text structure, underlying ideological and cultural concepts, assumptions, purpose and meaning as well as specificities of genre and mode (cf. Coyle & Meyer, 2021, pp. 168-170).

Approach Topics from Multiple Perspectives to Promote Textual Fluency and Cultural Consciousness

A deeper understanding of a topic requires insights into how different stakeholders view, evaluate and communicate issues that are of great importance to them. To accommodate for this, the

language classroom has to transition from a single-text model of reading to a more expansive model that includes multiple sources of information so learners can reach an «intertextual level of understanding» (Goldman *et al.*, 2016). This requires complex tasks that challenge learners to critically navigate diverse and sometimes conflicting information and perspectives from fictional and non-fictional texts in various forms and modes. Critical navigation involves analyzing author's intent, assessing the evidence presented in the text and evaluating the relevance and usefulness of each text for the respective task.

Recognizing texts as cultural artifacts shaped by language and societal norms, students learn to identify and question underlying power dynamics and social injustices (Pratt & Foley, 2020). By integrating a variety of digital text types – ranging from websites, newsfeeds, social media updates and podcasts – learners not only broaden their perspectives but also hone their ability to discern the reliability and quality of information, a key component of digital literacy (Stanford History Education Group [SHEG], 2016; Breakstone & McGrew, 2022).

When learners become aware that understanding of self, the world and their relationships with others is shaped by culture and language, they will recognize texts as cultural artifacts that must be analyzed and interpreted carefully to uncover and challenge inherent power relations and social inequities (Pratt & Foley, 2020).

Through intertextual reading activities, learners can be led/guided to understand that each of these texts is informed by different epistemological frameworks. Learners will develop *epistemic fluency* through analyzing, evaluating and contrasting these differing perspectives and gain insights that a single-text reading model cannot provide.

Nurture, Empathy and Compassion

Empathy and compassion are essential components of global citizenship: empathy enables learners to deeply understand issues, while compassion drives them to take action. Further, empathy and compassion serve as instruments to deeply understand others' positions. Thus, engaging critically with multiple perspectives should be guided by and ultimately lead to *empathic understanding*. Embracing and promoting the development of empathy in this sense and learning to relate to others in a detached and decentered (Kramsch, 2022; Rogers 1967b) manner, is beneficial for the reduction of my-side bias and fostering of multiperspectivity, connection, and effective arguing in deeper learning.

Additionally, developing empathy and a critical multi-perspectival understanding, also closely relates to learners' ability to become compassionate to themselves as well as to others (Fuochi *et al.*, 2018; Neff, 2023; Neff & Pommier, 2013).

Focus on Problem-Solving and Finding Common Ground

We have already established that the development of arguing skills is enhanced in environments perceived by learners as non-threatening (Young *et al.*, 1970). To do that, it is important to establish common grounds, as well as «bridges of shared language, experience, knowledge, and values» (Young *et al.*, 1970, p. 177). Developing meaningful counterarguments and pointing out the scope of their application (Young *et al.*, 1970) allows learners to demonstrate their critical, multi-perspectival understanding, empathy, compassion, and tolerance of ambiguity.

Adopting these strategies offers multiple advantages. They cultivate an «atmosphere of mutual trust» (Young *et al.*, 1970, p. 280), foster emotional management (Rogers, 1952; Andriessen & Baker, 2022; Young *et al.*, 1970), and establish «mutual communication» (Rogers, 1952, p. 88). In doing so, learners can focus on conflict-resolution (Rogers, 1952).

Arguing in this manner reframes «counterarguments» not as opposition but as *encounters* with different perspectives, inviting critical thinking, knowledge communication and the active utilization of global and democratic competence (OECD, 2018; CoE, 2016).

Maximise Student Engagement

Student engagement is a key driver of deeper learning (Coyle & Meyer 2021). The concept of the Relevance Continuum, introduced by Priniski *et al.* (2018), further elucidates the significance of making learning content personally meaningful to learners. This continuum outlines three types of relevance: personal association, personal usefulness, and identification, with identification being the most im-
pactful as it integrates the learning content into the learner's personal identity. This framework suggests that by increasing the relevance of the learning material, educators can facilitate the transition from situational interest, which is temporary and can be triggered by novelty, to individual interest, which is a consistent re-engagement with the subject matter over time. This shift is crucial for achieving a deeper understanding and increasing learner engagement.

Moreover, fostering an environment where learners are encouraged to connect learning content with their personal goals, interests, and identities not only enhances their motivation to engage but also promotes a sense of self-value, purpose, and control over their learning journey. Such educational practices, which emphasize authenticity, meaningfulness, and student agency, have been shown to stimulate deep engagement and are essential for empowering students to take responsibility for their learning (Paul Hamlyn Foundation & Innovation Unit, 2012).

This is especially important for global issues and democratic competences as mastering these domains requires learners' «active engagement» (CoE, 2016, p. 17). This, in turn, enables them to take action and manage issues that affect them, their own society, and beyond. Raising learners' awareness of the significant impact and the «importance of active citizenship» (CoE, 2016, p. 38) from the very beginning, equips them not only with the necessary mindset but also democratic competences to become global citizens that actively shape their future.

Make Room for Deep Practice

Practice is complex and often conflated with mere repetition. Automatizing skills involves navigating a dual-coding system, comprising an analytic, rule-based system and a memory-driven, exemplar-based system (Skehan, 1998; Lyster, 2007). Different practices nourish these systems: controlled and context reduced practice activities enhance rule-building while communicative tasks immerse learners in context-rich, meaning-focused interactions to develop actual usage (Lyster, 2007).

Daniel Coyle provides a neurological perspective on skill development, describing it as the growth of cellular insulation around neural circuits in response to specific activities (Coyle, 2010). He explains that skills consist of living neural circuits that expand based on certain principles. The process involves the myelin sheath, an insulating layer, wrapping around these circuits to improve their efficiency. The more myelin there is, the better insulated the circuits are, leading to quicker and more precise movements and thoughts. Coyle highlights that learning involves forming and strengthening these neural networks, and through deep practice, the myelin layer can be thickened, enhancing the speed of electrical signals, and thus improving performance.

Myelin growth is not automatic but results from specific types of focused practice. He outlines three key aspects of effective practice or «deep practice»: *chunking*, *repetition*, and *embracing struggle*. Deep practice is not merely repetitive but a highly focused and reflective process that involves setting goals, striving to achieve them, assessing the outcomes, and iterating the process. It demands deep engagement, long-term commitment, and motivation. Coyle introduces the concept of «ignition», an external cue that fuels the desire to excel and reinforces the belief that hard work can lead to mastery. This motivational aspect provides the energy for deep practice, which, over time, translates into skill improvement through the development of myelin.

To implement Coyle's (2010) strategies of deep practice in FL classrooms, educators can systematically break down arguing schemes into individual component steps which can be practiced and mastered (through scaffolding and feedback) before putting them together again. To reduce complexity, different perspectives on complex topics may be introduced sequentially. This approach allows for a gradual transition from single-text model to a multi-text model.

3. Conclusion

In conclusion, educators play a pivotal role in preparing learners to become global democratic citizens proficient in empathic skills, compassion, and *epistemic fluency*, thereby fostering a deeper understanding of the role of argumentative discourse in democratic societies. Such a transformation necessitates a comprehensive re-evaluation of teaching and learning practices, as we have illustrated in our model of Deeper Learning Ecologies for Global Citizenship.

Implementing these transformations in FL classrooms and connecting learners on various levels, will foster authentic and meaningful discourse. This not only enriches the classroom experience but also serves as a crucial initial step in combating the threats of fragmentation and filter bubbles that currently challenge democratic societies.

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4.

Reflection Framework to Promote Teachers' Analytical, Critical and Creative Thinking Skills¹

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ABSTRACT

To promote teachers' analytical, critical and creative thinking skills, reflection in teacher education is an essential approach to prepare them to become professional educators. The article deals with action research to construct, pilot and improve reflection framework guiding teachers from a simplified understanding of things to the ability to work with different tools of reflection expanding one's mindfulness. In each of four types of reflection, one specific reflection tool was explored, which allowed to track and follow the development of the teachers' analytical, critical and creative thinking skills. They also served as data collection methods where the content of the obtained narratives was analyzed. It can be concluded that analytical, critical and creative thinking skills should be perceived as complex skills that integrate the use of multiple sub-skills and knowledge to solve complex tasks or challenging problems, and reflection ensures the integrity of these skills.

KEYWORDS: Reflection-in-action; Reflection-on-action; Reflection-for-action; Reflection-withaction; Reflective practice framework and tools.

Introduction

Incorporating reflection into the teacher education study process is a crucial step towards equipping future educators with the analytical, critical, and creative thinking skills they will need to become professional educators. There is a continuum in reflection from having a basic understanding of things to being able to use various tools of reflection to increase one's mindfulness.

The demands to teachers – to enhance student achievement and take on new responsibilities – rise in response to the need to

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stay abreast of changes in the global scale, broad spectrum of society, growing amount of knowledge, and trends of the Fifth Industrial Revolution, marking digital transformation and the rise of new technologies in people's daily lives. With the COVID-19 pandemic, life became more digital. However, this meant learning not only new digital technologies, but the pandemic clearly showed the need to prepare people for difficulties, strengthen their emotional intelligence, the ability to quickly respond to changes and creatively find solutions in a rapidly changing life context. In 2024, Education 5.0 is the link that connects digital and technological knowledge with human social and emotional skills, with analytical, critical and creative thinking skills to promote personal and societal well-being.

Incorporating reflection into the teacher education study process is a crucial step towards equipping future educators with the analytical, critical, and creative thinking skills they will need to become professional educators. There is a continuum in reflection from having a basic understanding of things to being able to use various tools of reflection to increase one's mindfulness. The authors of the article could test their expertise gained since 2013 in using reflection to strengthen the professional skills of future teachers studying at the University of Latvia in a global educational environment by engaging in Erasmus+ KA2 Capacity Building for Higher Education project «Mitigate the Impact of Fourth Industrial Revolution on Indian Society: Education Reform for Future and In-service School Teachers» (EDUREFORM). Participation in the project encouraged authors to accurately summarize and explain their approach to the deliberate use of reflection, which promotes analytical, critical, and creative thinking skills. As each educational institutions in India maintains its own specific characteristics, but adding some new perspective to studies related to Education 5.0, it was an important reference point for the authors of this article to evaluate the proposed reflection framework and its relevance for achieving the goals of Education 5.0.

The aim of this article is to explore the framework of reflection for the development of analytical, critical and creative thinking skills to raise teacher's professionalism. In order to reach the aim the following research questions have been put forward:

- 1. what characterizes teacher's professionalism in the context of Education 5.0;
- 2. what types of reflection constitute the reflection framework;
- 3. what reflection tools help to develop analytical, critical and creative thinking skills from simple use to deeper understanding and holism.

1. Teacher's Professionalism in the Context of Education 5.0

The need to keep the track of the global scale changes, diversity of society, the increasing amount of knowledge and trends of the Fifth Industrial Revolution, increases demand to advance education level and acquire new teacher roles. Teachers' professional development is a substantial part of the lifelong learning concept, and it has been regulated by numerous wide-scale governmental documents, such as policies, strategies, and frameworks and it is the most important lever schools can invest in to improve student achievement (Miķelsone & Odina, 2016, 2018; Odina, 2022a).

Education 5.0 is becoming the primary approach to learning that aligns itself with the Fifth Industrial Revolution. In comparison to the Fourth Industrial Revolution which came with the utilization of artificial intelligence, internet of things, big data, etc., the Fifth Industrial Revolution (5IR) incorporates such concepts as «sustainability», «human-centeredness», and «concern for the environment». The use of «collaborative robots» and «smart cell industries» are examples to explain new technologies in the 5IR (Murata Newsletter, 2023). In the 5IR, shifting emphases instead prioritize efforts to understand where each actor excels and how humans and technology can collaborate, rather than one replacing the other. Its basic premise is that humans should collaborate closely with technology, to exploit the strengths of each and compensate for their corresponding weaknesses (Noble et al., 2022, p. 201). Thus, Education 5.0 is about humans, not technology, and it uses technology as a trigger for adding value and increasing effectiveness.

Therefore, aligning teaching and learning methodologies, approaches and strategies with the skills necessary in the future is of

fundamental topicality in the education of both teachers and students. The effectiveness of functioning in the new environment largely depends on the quality of teacher education that needs to go hand in hand with innovations and trends in education. It has not been even ten vears since the trends of Education 4.0 had emerged when Education 5.0 has started shaping the priorities (see Table 1). Namely, when the physical environment was losing the importance within the education process due to pandemic situation in the world, the development and implementation of remote learning gave the opportunities to learn anywhere and anytime, but now this learning should be improved by blended concept of personalized learning. Student-centered learning providing the opportunities for personalized input has to become more focused and professional. From project-based learning as one of the central approaches to achieve the objectives to applying creative thinking for solving the problems. In Education 4.0 students were increasingly engaged in gaining hands-on experience, thus, students' viewpoints and opinions were topical in designing the new study courses and developing new assessment types. Whereas in Education 5.0 the focus is on developing value-based learning culture and curriculum where students will be provided a real world to learn and perform the skills with adaptive competence in a real industry or business (Alharbi, 2023) which means that assessment also should involve the demonstration of the learned information transformed into a practical and applied knowledge. Transformative learning requires teachers to be facilitators and gain the skills of resource specialist, support person, mentor, helping hand, learner (Fisk, 2017; Odina, 2022b; Alharbi, 2023).

Teachers may choose among the variety of continuing professional development types and activities; however, an important issue is the teacher's individual choice towards one's own professional development activity. Allowing the teachers to determine what direction their professional development will take increases the success of the teachers in their journey to be lifelong learners (Trotter, 2006, p. 11). It is crucial to take responsibility for professional development, which further leads to the right choice of development pathways resulting in particular career goals.

| Trends related to Education 4.0 | Key areas and pillars related to Ed- |
|--|---|
| (based on Fisk, 2017) | ucation 5.0 (based on Alharbi, 2023) |
| The concept of learning anywhere and anytime Student-centered learning Project-based learning Gaining hands-on experience Students' viewpoints and opinions in designing the new study courses New assessment types Teachers – facilitators The necessity to critically assess the data | Improved and blended concept of personalized learning Focused learning to become a pro- fessional Applying creative thinking for solving the problems Coherent and relevant curriculum Developing value-based learning culture Innovative delivery and assessment Meaningful learning experience Transformative learning |

 Table I. The Comparison of Education 4.0 and Education 5.0 Based on Fisk (2017)

 and Alharbi (2023)

In order to understand teacher development in practice, Foord (2009) proposes a model (see Figure 1) which organizes a developmental activity into five concentric circles: teacher alone, teacher and students, teacher and colleagues, teacher and school, teacher and profession. The first circle, the inner circle, involves oneself, the teacher working alone, the things one can do on one's own to develop oneself and one's teaching. The second circle is teacher and students, the things one can do with one's students in mind, students' needs, getting feedback, trying something new. The third circle is teacher and colleagues, the things one can do together with colleagues in the classroom - peer observation, team teaching, staffroom support, mentoring to develop oneself and one's teaching. The fourth circle - teacher and school, the development actions one can take in the context of school, its staff and administration. The fifth circle – teacher and profession, the things one can do in one's professional capacity; attending and presenting at conferences, membership of professional communities, and writing for publication (Foord, 2009).



Figure I. Five circles of teacher professional development based on Foord (2009)

The manner and the scale of how teachers develop as professionals deepen the dimensions and cut the edges of their professional development, besides development can happen naturally as a result of teachers going about their everyday business. We are all developing, the question is how. If we reflect on where we actually want to go, as opposed to simply «getting somewhere», like Alice [*Alice's Adventures in Wonderland*, Lewis Carroll] and if we consider the action we can take to get there, we might find ourselves enjoying the sensation of walking quickly and confidently up an escalator, rather than laboriously up the stairs (Foord, 2009, p. 7). This determines to change of the perspective through which the teachers' professional development is being perceived, as therefore, teachers individually serve as the trend-setters of their professional initiatives and learning reflection.

The top 10 skills (see **Table 2**) necessary for students in 2020 stated in The World Economic Forum (2016) were complex problem solving; critical thinking; creativity; people management; coordinating with others; emotional intelligence; judgment and decision making; service orientation; negotiation; cognitive flexibility (World Economic Forum, 2016). In 2022, Zambas proposes a list

| of the 25 top | skills needed | to be a | successful | primary or | secondary |
|----------------|---------------|---------|------------|------------|-----------|
| school teacher | r. | | | | |

| World Economic Forum (2016) Zamb | bas (2022) |
|--|--|
| complex problem solving critical thinking1. Lear 2. Org 3. Mul 4.Tear coordinating with otherspeople management coordinating with others5. Abil emotional intelligence ijudgment and decision makinggervice orientation negotiation8. Inter 9. Self 10. Em 11. Cr 12. Cod 13. Cod 14. Cr 15. Ba 16. Tir 17. Cod 18. Cu 19. Str 20. Pri 21. Cl 22. Vir 23. Cl 23. Cl 24. Not 25. Cod | adership ganization lititasking mwork lity to teach mmunication aptability erpersonal skills f-evaluation motional intelligence ritical thinking ommitment omputer skills reative thinking asic first aid knowledge me management onflict resolution ultural competence rrong writing skills rioritization lassroom management rtual teaching lassroom management software egotiation ontinuous learning |



The list of 25 top skills for a successful primary or secondary school teacher has been sorted out using concept formation model and organized by the students of teacher education program into 5 levels: Personality, Guidance, Socialization, General knowledge and Digital literacy.



Figure 2. Top skills needed to be a successful school teacher based on Zambas (2022)

As it is seen in **Figure 2**, analytical, critical, creative thinking skills among adaptability, commitment, emotional intelligence, ability to teach are considered as personality ones and essential for the development of guidance, socialization, general and digital skills. However, analytical thinking is not directly mentioned among top 25 skills, and it might appear the opposite of creative thinking, but the reality is that analytical thought requires creativity.

2. Theoretical Background on Building Reflection Framework

Analytical thinking, critical and creative thinking skills can be characterized as complex skills that integrate the use of multiple subskills and knowledge to perform complex tasks or solve challenging problems. A complex skill is often evaluated by the efficiency and added value of the achieved result, and it is important not only in education, but also in the labor market. To promote future teachers' analytical, critical and creative thinking skills, reflection in the study process of the education of prospective teachers is an essential approach to prepare them to become professional educators (Whalen & Paez, 2019; Zwozdiak-Myers, 2024).

Reflection and its manifestations have been studied in the works of many authors (Dewey, 2012; Schon, 1983; Van Peet & Kroese, 2013; Callanan, 2003; Cottrell, 2013; De Bono, 2012; McMillan & Weyers, 2006; Mikelsone & Odina, 2016; Yang & Choi, 2023; Zwozdiak-Myers, 2024), and they all point to specific reflection actions: (1) the ability to describe the event, revealing how it happened and how things could have been done differently for a better outcome (Schon,1983; Van Peet & Kroese, 2013); (2) the ability to reflect and describe specific skills and actions, discovering how well one can do something now and what needs to be done to improve actions, or how to «make good even better» (Callanan, 2003; De Bono, 2012; Mikelsone & Odina, 2016; Zwozdiak-Myers, 2024); (3) the need to understand and reflect on the perfectly obtained/achieved result; wanting to know what and how was done to achieve such a result (Van Peet & Kroese, 2013; Cottrell, 2013); (4) the ability to analyze the activity and determine the next steps of the activity in order to be able to repeat this success (De Bono, 2012); (5) the ability to verbalize what has happened (make the internal external) and understand that reflection is an essential strategic tool (Cottrell, 2013; McMillan & Weyers, 2006; Yang & Choi, 2023).

Reflection encourages teachers to reflect on and understand questions:

- what it is that changes the learning/study/working experience;
- what specifically allows one to get the most out of the situation and what has been discovered about oneself;
- how to use one's experience in new conditions;
- how teacher's roles change (at the individual student level, at the classroom level, at the school level, at the level of parents and the wider community).

Reflection is the key to learning from experience and it is not an easy activity, so one needs someone, such as a mentor, supervisor, coach, colleague, who helps to learn reflection and provides support for learning reflection (Boud *et al.*, 1985; Zwozdiak-Myers, 2024). Support for learning reflection manifests itself in (1) providing an understanding of the value of reflection as a strategic framework; (2) al-

lowing one to know how to use different reflection types; (3) providing the opportunity to work independently with different reflection tools.

Reflection has a progression from a simplified understanding of things to the ability to practise different types and apply different tools of reflection (Boud *et al.*, 1985). Reflection has been recognized as a type of human thinking crucial for individual learning and development (Boud *et al.*, 1985; Dewey, 2012; Schon, 1987; Yang & Choi, 2023).

Loughran (1996) defines reflection as a conscious and purposeful act of thinking that focuses on how to respond to problem situations in teaching and learning. Dewey (2012) describes reflection as one of the modes of thinking and identifies five phases of thinking – problem, suggestions/proposal, reasoning/argument, hypothesis and testing. When these phases are organised and linked, they lead to consequences in action. Thus, it can be stated that reflection is a mental activity in which a person interprets one's actions and their regularity, makes conclusions and improves one's actions.

Dewey (2012) describes two types of reflection. One that is active at a specific time/moment when the action itself is taking place - casual reflection. And the reflection that occurs about feelings later, after the action - systemic reflection. It is without systemic reflection that the meaning of learning and understanding is lost, because the value of reflection is to create understanding. Listing facts is not yet understanding in the sense of changing behavior and attitudes. Schon (1983) associates reflection with its importance in the work of organizations. He coined the term reflective practitioner and used the concepts reflection-in-action and reflection-on-action (Schon, 1983). But his vision of reflection is not very different from Dewey, who used the concepts of incidental reflection (which occurs during an action) and systemic reflection after an action that is consciously designed/structured. Reflection-in-action is the process of considering and learning from events so that one is always alert. Quick/instantaneous reaction to what is happening provides an opportunity to react flexibly to the specific situation and prevents one from falling out of action or falling back.

Reflection-on-action refers to thinking about an action after it: what happened, how other people reacted, what were the benefits/ results, and what were the interrelationships between certain actions

that affected the outcome. This is what a person usually thinks/reflects when asked to do so (e.g., practice reflection).

Ghaye and Lillyman (2006) build on Schon's early work and introduce two new types of reflection – reflection-for-action and reflection-with-action – which can be drawn on to serve particular and meaningful purposes.

Therefore, four types of reflection can be listed:

- Reflection-in-action active at a given time during action occasional and *unintentional* reflection (Schon, 1987; Dewey, 2012; Van Peet & Kroese, 2013; Cottrell, 2013; Mikelsone & Odina, 2016)
- Reflection-on-action occurs from the senses and feelings later, after action systemic reflection; *consciously structured* (Schon, 1987; Dewey, 2012; Van Peet & Kroese, 2013; Cottrell, 2013; Mikelsone & Odina, 2016)
- Reflection-for-action is thinking about future actions with the intention of improving or changing a practice. During action, as well as reflect on past experiences, *before an action* takes place (Zwozdiak-Myers, 2024; Farrell, 2013; Ghaye & Lillyman, 2006)
- Reflection-with-action based on intuitive synthesis model – synthesizes the intuitive and the rational (Khatri & Alvin Ng, 2000; Elbanna, 2006; Ringel, 2003; Sinclair & Ashkanasy, 2005; Ghaye & Lillyman, 2006; Dane & Pratt, 2007; Miķelsone et al., 2014; Miller, 2022; Zwozdiak-Myers, 2024).

Mostly people think about things, events unconsciously or think about them in general. The moment of reflection is implicit. Of course, it has some value, but it is not exactly a designed, structured process, with a specific goal. On the other hand, if they are asked to reflect or critically evaluate something or about something specifically, people start to do it consciously using self-known types of reflection and tools, which are often uniform/unchanging. However, a uniform/ constantly used type of reflection and tool does not always guarantee a deeper understanding of the notion and seeing a new perspective. The proposed reflection framework by the authors of this article (see **Table 3**) has a characteristic sequence, from the simplest type of reflection (*reflection-in-action*) to the most complex (*reflection-with-action*), which is based on synthesizing the intuition and rationality. The levels of the reflection framework allow to draw parallels with the de-

cision-making and problem-solving model developed by Hallo and Nguyen (2022) (see Figure 3), which reflects the sequential/gradual process of decision-making and problem-solving moving from an external assessment achieved through perception and analysis to a deeper understanding and more holistic perception gained through intuition. Thus, both the reflection framework and the decision-making and problem-solving model provide a clearer understanding of the steps to be taken in solving and identifying problems of increasing complexity. When reflecting on a simple action or task, reflection uses the senses and limited perception. As the context of reflection becomes more complex, reflection also becomes more analytical and rational, allowing to reveal one's knowledge about specific notions, and in the result of reflection to come to a new action plan or new action step. This is the visible part of the iceberg concerning the reflection where perception and analysis are used. More effort should be put to reach deeper levels of reflection, where also individual experience, openness and insight and, finally, holism, allow to link the rational and intuitive world into a single whole. Reflection-with-action at the holistic level provides an opportunity to see and understand the notion in a broader content and wider context. In teachers' professional activity, it is essential for them to be aware of, use and manage all types of reflection and move up and down through all levels of complexity as needed.



Figure 3. The image of reflection based on the iceberg model of decision-making and problem-solving (Hallo & Nguyen, 2022, p. 18)

3. Research Methodology

The research has been carried out as action research since 2013. The research sample has been practicing teachers – master students of the Professional Master Study Program «Teacher» study module «Education for Well-being and Cohesion» taking the course «Educators Professional Identity and Pedagogic Mastery» – yearly intake of about 30 students. Four types of reflection: *reflection-in-action, reflection-on-action, reflection-for-action,* and *reflection-with-action* based on intuitive synthesis were practiced with every group. There were applied four reflection tools: «Heads and Tails», «MAX», «Smart, Pure, Clear Development Goals», «Metaphors» to enhance analytical, critical and creative thinking skills. In each type of reflection, one specific reflection tool was dominant to be explored (see **Table 3**), which allowed to track and follow teachers' use of analytical, critical and creative thinking skills, and these tools also served as data collection methods where the content of the obtained narratives was analyzed.

| Types of reflection | Complexity levels | Tools | Dominant skill |
|---|---|---|----------------------------------|
| Reflection-in-action (at the moment of the particular action; quick thinking and improvi- sation) | Perception (Senses) Analysis and Synthesis (Rational) | Heads and Tails | Critical thinking skills |
| Reflection-on-action (af- ter the action; about anything important) | Personal Experience (Relationships and Connections) | MAX | Analytical thinking skills |
| Reflection-for-action (for a cause of specific ob- jective; making plans for what one wants to do) | Openness and Insights (Deep Understanding) | Smart, Pure, Clear Development Goals | Self-evaluation skills |
| Reflection-with-action based on intuitive syn- thesis model (planned behavior that is mindful and derived from con- current contemplation) | Holism (Intuitive Knowledge of Natural Law) | Metaphors | Creative thinking skills |

Table 3. Proposed reflection framework

4. Discussion of the Data

For the *reflection-in-action* and covering the levels of perception (dealing with senses) and analysis and synthesis (looking for rationale), the tool of «Heads and Tails» was chosen.

Practising «Heads and Tails» and using it as a data collection tool meant that teachers were asked to give structured feedback evaluating the event that took place, learning process or what they liked about event/activity/assignment and so on. The focus is to internalize the fact that every strength has within it the potential for weakness, and likewise every weakness has within it the potential for strength (Odina, 2022b). The procedure starts with flipping a coin. If the coin lands on the head (number), it is necessary to share the strength, something is liked about the event that has taken place, or in the learning process or about place. Then it is required to describe «the other side of the coin» - what is the drawback still in the thing that is liked. If the coin lands on the tail (picture), the weakness is described, something they dislike in the learning process or what is not satisfying them and describe «the other side of the coin» – what is good about this negative side. The tool of «Heads and Tails» was applied to concentrate on the development of critical thinking skills, however, all skills in the focus of this research benefited from the regular practice of the tool.

Looking at the data gathered during the «Heads and Tails» application (see **Table 4**), the following evidence of the development of analytical skills has been found: breaking down complex problems, questions or challenges into smaller, more manageable parts: «It was difficult to fill in the observation sheets during the observation itself, so I wrote a transcription of the lesson during the lesson and only then filled in the observation sheets, it can be considered double work» (Teacher ES, 2023).

Concerning critical thinking skills, this tool activated such subskills as asking questions, defining problems, noticing and understanding its various aspects: «When I started working at the school, I felt strong in mathematics, but completely unprepared in medicine and psychology» (Teacher IB, 2014).

As to creative thinking skills, teachers were supposed to make connections between seemingly unrelated concepts, disparate elements or ideas and look at the problem from different perspectives, redefining it (defining again) to find innovative solutions. «During the internship, the teacher gave me the opportunity to conduct several lessons, which allowed me to gain several practical skills, but the second lesson was not as successful as I had hoped, it took much more time and the students did not want to answer the questions. I had to think about how to involve them» (Teacher MMJ, 2023).

During the *reflection-on-action* and covering the level of personal experience (exploring relationships and connections), «MAX» was chosen as a tool. MAX (Motivation – Acquisition – Extension) is based on autonomous learning theory, in which self-management approach is dominant and benefits from students' motivation, acquisition and extension (Odina, 2022a).

The reflection tool MAX (Motivation – Acquisition – Extension) has been used to complete unfinished sentences usually after learning activities: (a) three things I learnt/heard/understood; (b) two things I want to try/I will use; (c) one thing I would like to examine in more detail/I did not understand (Mikelsone & Odina, 2017).

The aim of this tool is to elicit different opinions about what they have learned/found out (learners' motivation), what they want to try out (the evidence of acquisition) and what they would like to examine more in detail (learners' readiness to extend the acquired, to apply in practice) (Odina, 2022a).

Looking at the data gathered during the «MAX» application (see **Table 4**), the following evidence of the development of analytical skills has been witnessed: obtaining information from various sources and multiple perspectives and allowing to gain a comprehensive understanding of the situation and critical evaluation of information and sources. «Pair work is productive and engaging for students, but I rarely use group work, because I prefer the individual learning style. During my studies, my thoughts about the usefulness of group work and its usefulness in educational work have changed. I will try to use this form of work more often in the future» (Teacher AS, 2015).

Concerning critical thinking skills, this tool activated sufficiently broad analysis, comparison and evaluation of information:

I gradually realized how to write the appropriate feedback. Initially, I wrote my work as a reflection of what was done and what I have discovered and how I will use it. My first work was more like a retelling of the lecture. Then, having analyzed the first work and made relevant

conclusions, I understood what the primary purpose of the MAX work was, to reflect on your feelings and gain knowledge during the seminar. Thus, I elaborated the second MAX and tried to combine both my reflection of the conference and my feedback on what I have learned and how it will contribute to my personality and my profession. And lastly, in the last MAX, I already tried to reveal all my thoughts and my emotions when we were attending workshops, because I still consider that was a valuable experience both for the development of my professional identity and methodologically for the development of my professional experience (Teacher JI, 2019).

As to creative thinking skills, the teachers were expected to reflect on experience and personal style and this was also admitted in their MAX reflections on this tool: «I consider success in this course by writing a MAX assignment. This enabled me to make self-analysis and look from another perspective to myself and motivated me for the further improvement of my professional competence» (Teacher KG, 2020).

For the reflection-for-action and covering the level of openness and insights (reaching deep understanding), the tool «Smart, Pure, Clear Development Goals» was applied.

First of all, the student teachers should start by evaluating their present skills according to five circles of development: teacher alone, teacher and students, teacher and colleagues, teacher and school, teacher and profession (Foord, 2009). Based on this evaluation they should rank their priorities, according to importance and urgency, then define their goals, using the following formula: Specific – Measurable – Attainable – Realistic – Time-phased – Positively stated – Understood – Relevant – Ethical and Challenging – Legal – Environmentally sound – Agreed – Recorded (Mikelsone & Odiņa, 2020). Teacher goals should be complemented by continuous feedback, open and honest dialogue, and additional opportunities for teachers to learn and grow through large and small group professional development. All of these pieces work together in order to help teachers develop and grow.

Looking at the data gathered during the «Smart, Pure, Clear Development Goals» practice (see **Table 4**), the evidence-based reasoning and determination of cause and effect relationship in a specific situation concerning analytical skills has been found: because I have a set goal – to finish my master's degree and nothing else can be more important than this goal at the moment. To implement this, I have informed the students why I show experiments in class (ones that are not appropriate for the age). They are excited about the experiments and, as practice shows, the understanding of physical phenomena has also increased. They watch the experiments with great interest and demand that all lessons be like this [...]. Although the workload is very high at the moment, I still divide my efforts and plan small steps of the work progress – those that can realistically be completed in a certain time interval (Teacher SR, 2018).

Concerning critical thinking skills, this tool facilitated taking responsibility for one's views and/or choices:

I chose to become a mathematics teacher. For as long as I can remember, I have thought about becoming a teacher. Both my parents were teachers all their lives, and this environment has been known since childhood. From a young age, I returned to school together with the teachers in mid-August and participated in the preparation of the school for the new school year (Teacher IB, 2014).

As to creative thinking skills, teachers were expected to cooperate with people of different opinions and knowledge, adapt and adjust the thinking process to the context, situation or nature of the problem. «At that time, my family's financial situation could not allow me to remain unemployed. That's why I started working in the Latvian group with a dictionary under my arm. At night I studied dialogues that I would have to speak during the day» (Teacher AS, 2013).

Finally, during the *reflection-with-action* and reaching the level of holism (creating intuitive knowledge of natural law), «Metaphors» were practiced. A linguistic statement that corresponds to the cognitive process of transferring information or meaning from one specific subject (the source or analogy) to another specific subject (the target) is called an analogy. Metaphors are one way to express analogies. Metaphors are rich, data-reducing, and pattern-making tools that people frequently use to express their ideas, actions, and experiences. This helps to link empirical data with theoretical frameworks. Metaphor allows to use what is known about one's physical and social experience to provide understanding of countless other subjects. It does not necessarily correspond to what is happening in the observable physical world, but is every

bit as «real» because people take it for granted, act upon it and often can't conceive of alternative way of viewing things (Mikelsone et al., 2014). The elephant metaphor was employed in this study to ascertain how teachers understood the numerous components that go into creating a professional identity. So, it was decided to explore the extent to which – and how – teachers engaged in various forms of professional work might define and perceive their professional identity. Expected outcome - to get keywords of professional identity, raise teachers' self-awareness of their professional identity. The procedure involved: making associations, brainstorming, coding, making concepts, conceptual sorting in categories, memoing and outlining theories. In the beginning, the participants were asked to share their associations with the elephant. In order to minimize pre-conceptions, the brainstorming: what they associated with the parts of the body of the elephant: the trunk, the ears, the tail, legs, tusks etc., took place. Afterwards, the respondents worked in groups of three and they compared the teacher's professional identity to the elephant, by filling up the shape/model of elephant with the content that to their mind corresponded to the teacher's professional identity. Finally, the teachers were asked to evaluate their professional identity using the terms by their choice from the list of terms. The format of the evaluation was a narrative essay.

Looking at the data gathered during the «Metaphors» application (see **Table 4**), the following evidence of the development of such subskills of analytical skills has been found: predicting, making forecasts based on available data and trends and using problem solving methods (strategies): «Right now, it's a variable and it's been changing especially rapidly in my life for the last couple of years. But I can tell you who I was yesterday, how I chose my profession, and what I'm going for, where I want to be. And somewhere in the middle of this journey I am right now» (Teacher AZ, 2013). Dealing with personal prejudices and reducing negative emotions:

I have knowledge of what is and how to calculate mode, but I have no skills in classroom management, group work for primary school children. I'm not sure I can maintain a collegial relationship with a despotic retired teacher. I miss that specificity. So – will the elephant be sufficiently Christian and ethical, or will it be philological, exact, academic – i.e., incomprehensible to children? (Teacher AK, 2017).

Concerning critical thinking skills, this tool helped choosing the most appropriate solution to the problem: «sometimes it's still a challenge to dare to offer something unprecedented to the class, which seems to show that [I'm] still partially learning the level of self-esteem awareness»; «I constantly challenge myself not to follow other people's paths, but to come up with my own example, explanation, association» (Teacher AV, 2014) and forming independent judgments and logical arguments:

I have realized that direct language is not really respected at school. I think it is related to the fact that the collectives are large and the composition consists mostly of the fair sex, who like to «speak through flowers». I have also realized that parents often like it when the teacher talks without naming things. I'll admit, I've put on a lot of makeup on my elephant's teeth, and there are times when I choose to remain silent instead of saying what I think (Teacher SG, 2016).

As to creative thinking skills, teachers gained openness to new perspectives, unconventional approaches and rejection of rigid dogmatic thinking models: «currently my approach to innovations [in pedagogy] is - you can't know if it works until you try it» (Teacher AV, 2014); «[...] in summer, I plan to go to work in Cambodia or Myanmar for a year alone, or travel around Asia with a friend. To spend the maximum amount of time overcoming and fulfilling oneself in nature and in unusual situations, helping others, finding one's essence and destiny» (Teacher AZ, 2013). There was found the evidence of imagining new /different concepts and solutions, which probably do not yet exist in reality: «[...] these will be the eyes of my elephant, which sees and captures the path taken, and remembers it to update the information for future similar situations. In professional activities, these abilities are most directly manifested in planning» (Teacher SG, 2016).

Intuition or a sudden flash of vision that allows to see new perspectives: «And when I climb my "Macchu Picchu" and be the teacher I want to be, my baggage of experience will be filled with stories of laughter and tears, it will be multicultural, open and inviting. Hopefully» (Teacher AZ, 2013); acceptance of uncertainty, going outside one's comfort zone, readiness to take risks: «I believe that I know well who I am, and after a somewhat prolonged period of doubt and reflection, I also know what I want. I'm not sure if I

can say this without being thought of as weird, but I host multiple identities that are constantly at war with each other. This also explains the fact that sometimes I tend to act spontaneously, even unexpectedly» (Teacher AV, 2014). Finally, creation of new, unique and different ideas that are not generally known or used and the evidence of playfulness and willingness to experiment with different ideas, materials or approaches:

Comparing my professional identity to an elephant, the most obvious function seems to me to be the skin. It echoes the beginning of my professional career, during which I was actually without it. With skin I associate the metaphor of thick skin. This aspect really seems to be the strongest, because I was advised to grow a thicker skin by an experienced teacher from a circle of friends, when I was emotionally drained and psychologically devastated after my first semester at school. I remember that to some extent this advice seemed useless to me, because I believed that teaching is a vital profession, so responsible that I have no right to hide behind a thick skin, isolating myself from some emotions, because everything must be true to the point of pleasure, because I work with children and I am responsible for everything. I think - if I grow that skin, there will be no point in working at school anymore. However, I had greatly misunderstood this skin and associated it with human qualities (probably because the biggest experiences in the first year's experience were directly in human contact and not in professional activities). I managed to grow the necessary and right skin thanks to my studies - I gained an understanding of the pedagogical processes with which I work on a daily basis, I gain an understanding of what should be done to achieve certain goals, I have colleagues with whom I can talk and ask for advice without fear or suspicion, which exists in a tense collective atmosphere. It seems that insecurity about one's teaching skills also allowed the negations experienced to leave such a big emotional and psychological impact. Therefore, I can say that my elephant has finally got a skin (Teacher SG, 2016).

With every deeper level the amount of reflection also increased.

| Expression of analyti- cal thinking skills | Expression of critical thinking skills | Expression of creative thinking skills | |
|---|---|---|--|
| Reflection-in-action Heads and Tails | | | |
| breaking down complex problems, questions or challenges into smaller, more manageable parts | asking questions, defin- ing problems, noticing and understanding its various aspects | making connections between seemingly un- related concepts, dispa- rate elements or ideas looking at the problem from different per- spectives, redefining it (defining again) to find innovative solutions | |
| Reflection-on-action MAX | | | |
| obtaining information from various sources and multiple per- spectives, allowing to gain a comprehensive understanding of the situation critical evaluation of in- formation and sources | sufficiently broad anal- ysis, comparison and evaluation of informa- tion | • reflection of experi- ence and personal style | |
| Reflection-for-action Smart, Pure, Clear Development Goals | | | |
| evidence-based reasoning determination of cause and effect relationship in a specific situation | taking responsibility for one's views and/or choices | cooperation with people of different opinions and knowledge adaptation, adjusting of the thinking process to the context, situation or nature of the problem | |

| Reflection-on-reflection based on intuitive synthesis model Metaphors | | | |
|---|--|---|--|
| predicting, making fore- casts based on available data and trends use of problem solving methods (strategies) dealing with personal prejudices and reducing negative emotions | choosing the most appropriate solution to the problem forming independent judgments and logical arguments | openness to new perspectives, unconventional approaches and rejection of rigid dogmatic thinking models imagining new/different concepts and solutions, which probably do not yet exist in reality intuition or a sudden flash of vision that allows to see new perspectives creation of new, unique and different ideas that are not generally known or used acceptance of uncertainty, going outside one's comfort zone, readiness to take risks playfulness and willingness to experiment with different ideas, materials or approaches | |

Table 4. Expression of skills based on the reflection type and tool used

5. Conclusion

In the professional development of teachers, reflection is an important tool that allows one to better understand not only what teachers experience in their lives, but also expands their level of awareness – «deep awakening» (Frīks, 2017). It encourages to find ways to respond to the changing context of education and grow both emotionally and professionally in order to discover purposeful meaning.

Reflection requires (1) the capacity to describe the event; (2) the ability to think over and describe the specific skills and activities; (3) the need to understand and contemplate on the obtained/achieved result; (4) the ability to analyze performance and identify the next action steps to be able to repeat success; and (5) the capacity to articulate the thoughts.

When there is no systemic reflection, there is no sense to learning and comprehension.

- The value of the reflection is to create awareness;
- Learning by memorizing and listing facts is not enough to change behavior and attitude.

By understanding the nature of reflection and practicing reflection framework, consciously choosing and using reflection tools, teachers improve analytical, critical and creative thinking skills. The results of the research made it possible to conclude that the teacher's professionalism in Education 5.0 context is characterized by the need to pay attention to the culture of teaching, a personalized approach and the ability to see things holistically. The holistic vision is characterized by the synthesis of rational and analytical thinking and the integrity of skills such as analytical, critical and creative thinking. It is ensured, developed and promoted by deliberately learned and used types of reflection and tools, and moving from the simplest type of reflection to the most complex, the skills of analytical thinking, critical thinking and creative thinking become mutually complementary and complex.

In Education 5.0 context, reflection becomes a basic component for both teachers' professional growth and development, allowing to prepare and accept 21st century challenges in the classroom and promotes the enhancement of 21st century necessary skills, including analytical, critical and creative skills also in their students' performance. In order for the reflection to become a tool for growth and professional development, it is important for teachers to learn and understand the sequence of all four types of reflection and to be able to use appropriate reflection tools. The result of the research is the proposed framework of reflection, in which analytical, critical and creative thinking skills are promoted by sequentially moving through all types of reflection: from *reflection-in-action*, *reflection-on-action*, *reflection-for-action* to *reflection-with-action*. The research data allow to determine that the successively acquired types of reflection and ap-

plied tools form the integrity of these skills at the holistic level. The teacher's professional activity is in many ways externally conditional (standards, programs, etc.), which is also revealed in teachers' reflections during reflection-in-action and reflection-on-action. The content of these reflections is more related to the external world, which requires specific solutions. Studying the types of reflection at a deeper level (*reflection-for-action, reflection-with-action*) reveals more subjective and internal problems, the solutions of which are related to internal changes, change of opinions, habits, attitude, values, and require recognition of both the rational and intuitive spheres. By learning all four types of reflection and knowing how to apply reflection tools, teachers are able to move towards holistic thinking, which is the emphasis of Education 5.0.

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5.

Assessing Scholastic and Co-Curricular **Areas of Student Learning** through Multi-Perspective Teaching¹

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Assessments have mostly been associated with the scholastic learning domain, where empirical data is used to understand the knowledge gained by students through reading ABSTRA of the course material. Yet, multiple factors like students' inclinations and perspectives should be considered to make assessments more reliable. This paper presents advantages of adopting a teaching practice, namely Multi-Perspective Teaching that considers the varying perspectives of students on learning and assesses their performances, curricular and co-curricular, accordingly. Based on the Howard Gardner Theory of Multiple Intelligences (Gardner, 1983), the practice includes all three learning domains and proves its effectiveness in upskilling school students as per their interests.

KEYWORDS: Multi-perspective teaching; Multiple intelligences theory; Reliable assessments.

Introduction

Traditionally, assessments have been seen in light of the scholastic domain, which promotes the practice of rote-memorization. This approach leads to an educational environment, where only certain students excel, while those with diverse abilities and learning styles get overlooked (Chapman & King, 2003).

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On this matter, the challenges of managing mixed classrooms, which include students with different abilities and distinct interests and learning preferences, have been highlighted by Ansari (2013). This situation has led classroom teachers to struggle in addressing the diverse needs of their students (Meyer, 2008).

Therefore, there is a need for educators to adopt a multidisciplinary teaching approach that caters not only to scholastic aspects of learning but also the co-scholastic areas.

Multi-Perspective Teaching as a concept stems from the same line of thinking. Drawing inspiration from Howard Gardner's Theory of Multiple Intelligences (Gardner, 1983), the teaching approach highlights the feature of individual differences with respect to learning styles and speeds that lie among students in a given class.

In such a scenario, MPT (Multi-Perspective Teaching) emerges as a powerful teaching practice for educators, where assessments can be made more reliable and inclusive, as students are able to perform to the best of their abilities and as per their own learning styles. Additionally, assessments with such basis provide a fresh perspective, as research in this field is limited. Correspondingly, this paper demonstrates how the practice of Multi-Perspective Teaching serves as a successful tool of *assessment for learning* and allows school students with diverse abilities and intelligences to adopt their individual learning styles.

The objective of this paper is to showcase the impact of Multi-Perspective Teaching as a learning and assessment tool for the teachers and learners, especially including both the scholastic and co-curricular areas of learning while assessing student performance.

Chronologically, this paper highlights the idea of assessment in education and its relation with MPT (Multi-Perspective Teaching), clearly defining the different steps to be followed in the implementation and assessment of MPT tasks. It further explains the feedback collection procedure and looks into the impact of Multi-Perspective Teaching through post-feedback analysis.

1. Assessment in Education and Multi-Perspective Teaching

Assessment in education involves the evaluation of students' knowledge, skills, and talents. The term comes from the Latin word *assessus*, which means *to sit beside* or *to sit with*. These interpretations of the word suggest that assessment is an inclusive approach (Wiggins, 1993).

Correspondingly, the main aim of the teaching-learning process lies in enabling students to realize their talents, learning styles and inclinations and assessing them in a fresh and an inclusive manner on the knowledge they acquire (Chitkara & Natarajan, 2015). Thus, assessment should consider the learning resources, student interests, and the like (Kapoor & Natarajan, 2014). Natarajan (1977) has further outlined that the elements of the assessment process include abilities, interests, attitudes, and the evaluation thereof.

Multi-Perspective Teaching as a teaching practice considers the different interests, perspectives, and styles of learning of students. This, in effect, means that it stands to render greater reliability and inclusivity to the process of assessment, allowing students to perform a specific learning task as per their style of learning. The assessment of such a task, therefore, is believed to be more accurate and well-grounded.

Premised on the Howard Gardner's Theory of Multiple Intelligences (Gardner, 1983), the practice takes into account the Bloom's Taxonomy (Bloom, 1956), Krathwohl's Taxonomy (Anderson & Krathwohl, 2001), and Dave's Taxonomy (Dave, 1967) that emphasize on catering to the three learning domains, namely cognitive, affective, and psychomotor. Under MPT, this is done by ensuring the assignment of interest-specific, multidisciplinary, and art-integrated tasks to students and assessing them on the basis of their performance therein. Ideally then, any and all assessment procedures must keep in consideration the sequential curriculum delivery, which shall ensure the achievement of all skills, as in the above-mentioned taxonomies (see Table 1).


 Table I. Sequential curriculum delivery as mapped with different learning taxonomies based on Srivastva (2011)

Correspondingly, a look at the Kulshreshtha Natarajan Taxonomy (Natarajan & Kulshreshtha, 1983) suggests the core areas of teaching and assessment, which may also be referred to, during the preparation of an MPT task (see Table 2).

| Basis for scholastic and non-scholastic area of assessment | | | |
|--|------------------------------------|--|--|
| Knowledge | Research Abilities | | |
| (Specific) Comprehension | Expression | | |
| (Whole) Comprehension | Psychomotor Skills | | |
| Application | Social Virtues/Skills | | |
| Evaluation | Good Habits/Skills of Studies/Work | | |
| Synthesis | Communication Skills | | |

Table 2. Kulshreshtha Natarajan Taxonomy (K.N.Taxonomy) based on Natarajan& Kulshreshtha (1983)

The essence of Multi-Perspective Teaching therefore lies in inclusivity and diversity. Herein, a teacher may create different seating arrangements and interest-specific groups of students within classrooms, to ensure that both learning and assessment take place as per their liking and learning styles, and that the teaching process isn't limited to just one domain of learning.

Diversity, *per se*, has become more important and a central theme in classroom teaching strategies (Tomlinson & McTighe, 2006; Winebrenner, 1992). Thus, a need has arisen to cater to the different learning needs of students, for which varied strategies have to be implemented. Some of these strategies may include role playing, extra home assignments, classroom activities and competitive games (Pedersen & Kronborg, 2014). Tomlinson (2001) has further validated the effectiveness of such strategies, arguing that teachers should have a variety of teaching methods in the mixed classroom setting in order to enhance the outcomes of the teaching.

Accordingly, under Multi-Perspective Teaching, if a student, for instance, is musically-inclined, he is given the chance to learn a concept of any subject through activities based on the medium of music, while a student with preference for art is given the opportunity to learn any topic in the class through art-based activities.

In a mixed-ability classroom, the teaching practice of Multi-Perspective Teaching therefore holds various benefits. These may be accounted as follows:

- the practice helps in the enhancement of student knowledge and skills in interest-specific areas;
- it renders greater access to learning at individual learning speeds;
- MPT further ensures enhanced inclusivity within classrooms;
- it leads to the development of social and interpersonal skills;
- it provides a greater sense of self-worth and self-esteem.

1.1. Steps to Use Multi-Perspective Teaching in Classrooms

The effective implementation of the Multi-Perspective Teaching follows a set of well-defined steps. Beginning with the selection of the

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MPT topic mapped with school curriculum, the teacher involves the class in the general reading and explanation of the topic. It is then expected to be followed by the creation of a *concept map*, which includes the facts, definitions, key terms, and key dates related to the topic, providing a visual outline of the lesson and catering to the cognitive domain of learning.

For instance, the chapter of *Communication and Modern Techniques*, given in the class 5 social science textbook, may be understood through the *concept map* as given in **Figure 1**.



Figure I. Example of a concept map on Communication and Modern Techniques

After implementing the traditional teaching approach and concept clarity, the next step includes the allotment of interest-specific co-curricular clubs and corresponding creation of seating plan within the classroom. These interest-specific co-curricular clubs may be related to oration, drama, sports, coding, photography, animation, and so on, and may be allotted to the students on the basis of their preference.

A proposition of such co-curricular clubs may be derived from the vocational squad system followed at a leading private school, Chitkara International School, India (see Figure 2). 5. Assessing Scholastic and Co-curricular Areas of Student Learning • 111



Figure 2. Co-curricular squads at Chitkara International School, India

Following this and on the basis of the groups so formed, the teacher comes up with a seating plan, placing students with similar interests together within the classroom. An arrangement like this is expected to encourage children to come out of their shell and engage in learning activities with greater confidence and interest. The outputs of such a group are also thought to be more refined and creative, as the like-minded students collaborate on completing various tasks together.

In the next step of the MPT implementation procedure, focus is made on the assignment of interest-specific tasks to the groups made above. Herein, the teacher's creativity comes into play while creating different interest-specific and multidisciplinary tasks to be assigned to these groups. Correspondingly, a teacher teaching the topic of *Communication and Modern Techniques* may give a task of composing a rap song or a poem showing the evolution of the various means of communication to the musically and writing-inclined students in the classroom.

Next, due care is further taken regarding the proper demonstration and assessment of the assigned tasks. Essentially, under this step, the teacher demonstrates the assigned tasks to students along with her co-teachers, and gives a certain timeline to students to collaborate on the task and complete the same. In that, students are expected to perform the activities and showcase the knowledge they have ac-

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quired from the lesson in their own learning styles and art forms. A performance premised on individual interests allows the teacher to fairly assess the attainment of various learning levels under different domains mentioned in the taxonomies that have been previously referred to in this paper. The assessment then is expected to be done by the teacher following specified and predetermined rubrics as explained ahead.

1.2. Multi-Perspective Teaching as a Scholastic and Co-Curricular Assessment Tool

Because the tasks performed by students under Multi-Perspective Teaching remain essentially multi-disciplinary with effective integration of both scholastic and co-curricular domains, the assessment of these requires rubrics that cater to both the domains with equal emphasis. The process of MPT evaluation can then be categorized under *assessment for learning* (Gipps, 1994), which renders a higher degree of autonomy to students in the learning process; the significant part being the provision of adequate and relevant feedback by the teacher instead of mere grades (Kapoor & Natarajan, 2014).

This scenario calls for specified, pre-determined rubrics that assess both aspects of learning (co-curricular and scholastic) and take into consideration the three learning domains, namely cognitive, affective, and psychomotor.

For the purpose of this paper and as a reference, the table given below (**Table 3**) showcases sample rubrics for an art-integrated activity that include *creativity* (cognitive), *relevance* (cognitive), *confidence* (affective), *knowledge of the subject* (cognitive), and *tools/ aids used* (psychomotor & cognitive). These rubrics have been premised on the five-point Likert Scale (Likert, 1932). 5. Assessing Scholastic and Co-curricular Areas of Student Learning • 113

| Name of the Student | Creativity | Relevance | Confidence | Knowledge of the Subject | Tools/ Aids used | Total Marks |
|---------------------------|------------|-----------|------------|--------------------------------|------------------------|----------------|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

Table 3. Sample of the Task Assessment Rubrics under MPT

On the basis of the performance ascertainment, the teacher at this stage is expected to provide adequate feedback to students, enabling them to bridge the learning gaps, if any.

2. Methods and Data of Post-Feedback Related to the Impact of Multi-Perspective Teaching

Feedback is an integral part of the learning process that allows the identification of strengths, weaknesses, and areas of improvement. In this case, creating the opportunity to seek feedback on teaching practices from students remains crucial (Chitkara, 2021).

Keeping the aforementioned in mind and to verify the impact and effectiveness of Multi-Perspective Teaching, the *mixed-method approach* (Johnson *et al.*, 2007) has been used, where *rapid feedback method* (Van den Berg, 2003) along with feedback with a questionnaire comprising open-ended questions is sought from the students. The results acquired from the rapid feedback and open-ended questions are then evaluated quantitatively and qualitatively, respectively, and the interpretations are made, showcasing the veracity of the effectiveness of the MPT teaching practice.

For the quantitative assessment, objective-type answers are sought and responses in percentage form are recorded by dividing the number of responses by the total number of subjects surveyed and multiplying the result with 100.

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On the other hand, for the qualitative assessment, subjective-type answers are sought from the respondents and the recurring themes and keywords in the responses are drawn out and interpreted, based on the thematic interpretation method (Ham, 1992).

For the purpose of the present paper, a research was conducted at Chitkara International School, Chandigarh, India, wherein a sample of 120 students from class 5 was taken. These students were asked a predetermined set of objective-type and subjective-type questions, focusing on their experience of and learnings from the Multi-Perspective Teaching task.

The questions as mentioned below belonged to a specified class 5 social science topic *Communication and Modern Techniques* and each student was given five minutes to complete the survey. The responses to the following questions were recorded for the quantitative analysis:

- How did you find the Multi-Perspective Teaching task on Communication and Modern Techniques?
- Was it easier to learn the concept of *Communication and Modern Techniques* through Multi-Perspective Teaching?
- Do you think your communication skills have increased after participating in the Multi-Perspective Teaching task?

For the first question i.e. *How did you find the Multi-Perspective Teaching task on Communication and Modern Techniques*?, a set of two alternatives was given to the sample, namely *challenging* and *enjoyable*, to ascertain the effectiveness of the task and students' perception of it. Out of the two choices, 107 students selected *enjoyable* and 13 students said that they found the task *challenging* (see Figure 3).

Similarly, for the second question i.e. *Was it easier to learn the concept of Communication and Modern Techniques through Multi-Perspective Teaching?*, the yes-no alternatives were given to the respondents and responses were received for the two alternatives in the ratio 14:1 (see Figure 4).

Finally, for the third question i.e. *Do you think your communication skills have increased after participating in the Multi-Perspective Teaching task?*, a majority of students opted for the positive alternative and mentioned that they witnessed substantial improvement in their communication skills, while 22 students selected the negative and disagreed with their counterparts (see Figure 5).

Additionally, for the qualitative data collection, open-ended questions as given below were asked from the survey sample and recurrent 5. Assessing Scholastic and Co-curricular Areas of Student Learning • 115

themes or keywords were extracted to establish the successfulness of Multi-Perspective Teaching as a teaching and assessment tool.

- How did the Multi-Perspective Teaching task on Communication and Modern Techniques help you learn the concept in an easier manner?
- What did you enjoy the most about the Multi-Perspective Teaching task on *Communication and Modern Techniques*?

I felt I could see the means of communication as I drew them in my drawing book. It helped me imagine what I was reading and learn about them in an easy way.

Grade 5 Student, CIS, India

I connected one dance movement with one means of communication. This helped me learn the names of all of the communication means.

Grade 5 Student, CIS, India

Sample I. A few of the responses recorded on the question, How did the Multi-Perspective Teaching task on *Communication and Modern Techniques* help you learn the concept in an easier manner?

I loved learning about John Baird and also about Doordarshan. When I was creating the drawing on internet, I felt my drawing looked better than ever. I felt more creative.

Grade 5 Student, CIS, India

As I was writing my rap song on communication, I learnt many new words and read many interesting articles. I can now use these words to impress my friends.

Grade 5 Student, CIS, India

Sample 2. A few of the responses recorded on the question, What did you enjoy the most about the Multi-Perspective Teaching task on *Communication and Modern Techniques*?

The responses recorded under the qualitative assessment were carefully observed and common keywords were ascertained. Considering the recurrence of these certain words, the effect and impact of the task was analyzed and interpretations were further made on the basis of thematic interpretation (Ham, 1992), as explained in the section given ahead. Therein, *creativity, communication, research ability*,

and *team work* were found to be the reappearing themes in the responses received from the sample.

3. Result Analysis

Feedback analysis forms the basis for gaining insights into the effectiveness and scope of improvement of any given project. Considering this, the post-feedback analysis was undertaken during the course of this research on the basis of the data collected through mixed-method approach (Johnson *et al.*, 2007). The following findings were observed therein.

For the quantitative analysis, the question-wise responses were recorded graphically.





The MPT task on *Communication and Modern Techniques* was found enjoyable by about 90% of the students surveyed, while around 10% of respondents found it challenging to complete. Evidently, the effectiveness of the teaching practice is clearly seen in the wide acceptance of it as an enjoyable activity. While students got to express their knowledge of the subject in their preferred mediums and styles, the overall output and efficiency increased substantially.



Figure 4. Responses recorded on the question, Was it easier to learn the concept of *Communication and Modern Techniques* through Multi-Perspective Teaching?

The ease of learning was further established under question 2, *Was it easier to learn the concept of Communication and Modern Techniques through Multi-Perspective Teaching*, with almost 94% percent of respondents confirming they felt a greater access to learning (Yes) and six percent of respondents stating that they had felt no or little ease in learning the concept (No).



Figure 5. Responses recorded on the question, Do you think your communication skills have increased after participating in the Multi-Perspective Teaching task?

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Next, the ability to communicate evidently increased among the students who participated in the Multi-Perspective Teaching task as about 82% of respondents believed that their communication skills improved considerably by working in a group setting with the like-minded people, while 18% believed that there was no change in their communication skills.

Contributing to the interpretations made above and under the qualitative analysis of subjective-type responses, the central themes or main messages were found out and established on the basis of their recurrence or frequency observed in the answers recorded under open-ended feedback (see Table 4).

| Themes identified | Frequency/ Recurrence | Remarks/ Interpretation |
|----------------------|--------------------------|--|
| Creativity | 98 | Around 82% of the students (98 out of 120) believe that the MPT task helped them enhance their creativity skills. |
| Communication Skills | 80 | Another central theme observed was students' belief in the development of their communication skills due the MPT task. Resultantly, around 67% of students (80 out of 120) highlighted the same in their responses. |
| Research Ability | 68 | 57% of students (68 out of 120) be- lieved that their inclination towards research and the ability for the same increased substantially after participating in the interest-specific task. |
| Team Work | 78 | Lastly, 65% of respondents (78 out of 120) held that they learned team work skills and gained team spirit working with like-minded people for a common task under Multi-Perspective Teaching. |

Table 4. Interpretation of Open-Ended Feedback on MPT task

The interpretations alluded to the capacity of an MPT task to enhance analytical, critical and creative thinking skills of students. While the majority of the sample held that the task helped them improve their research ability and creativity, it was also believed to have increased the interpersonal skills of students, as communication and team work emerged as the central themes of the qualitative feedback. Notably, various skill sets could hence be targeted by using Multi-Perspective Teaching, as children engage absolutely in learning a subject matter and gain various skills in doing so. In light of the rapidly developing world, such a teaching approach seems highly impactful.

4. Conclusion

Assessments need to be designed reliably to promote the affinity for learning among students. Correspondingly, each learner's own perspective and inclination must be kept in mind and considered while creating evaluative tasks.

In light of the foregoing, the use of Multi-Perspective Teaching as a learning and assessment tool appears to be an emerging promising approach that offers a more reliable and enjoyable learning and assessment experience for both teachers and students.

The MPT practice's USP lies in its ability to cater to all three domains of learning *viz.* cognitive, affective, and psychomotor, and effectively merge the scholastic and co-curricular areas in the process of learning and assessment. Moreover, the integration of MPT in educational practices serves to foster educational equity, where children are able to put forth their best performances on the basis of their interests and likings and thrive in an educational environment that values their individuality.

However, it is important to acknowledge the challenges associated with the practice. While this research has revealed the potential of MPT, its successful implementation depends on factors such as adequate teacher training and resource availability within schools. These factors should therefore be considered when implementing MPT in different schooling contexts. Not to mention, because the paper constitutes a pilot study on the practice of MPT, a wider study should be conducted for the generalization of results.

Nonetheless, Multi-Perspective Teaching may be looked at as a stepping stone towards establishing truly happy school classrooms, wherein each student stands to gain from the process of learning and 120 • Niyati Chitkara, Honey Chitkara and Dolma Pathela

assessment and is provided a level playing field in terms of enhancing their interest-specific skills.

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6.

Promoting Deeper Learning Competencies in the Classroom from the Perspective of Indian Pre-Service Teachers¹

WILKO REICHWEIN^{*} AND NIDHI WALDIA^{**}

ABSTRACT

The evolving landscape of work, driven by new technologies such as artificial intelligence and robotics, demands a shift in the skills required for future employment. To equip students for these changes, a focus on 2 l st-century skills is critical. This research paper examines the transformative impact of international exposure on Indian pre-service teachers during their teaching internship in German Gymnasiums as part of the EDUREFORM project under the Erasmus+ program. Interviews with six participants reveal how the experiences at Gymnasium Hochrad and Gymnasium Rissen in Hamburg, Germany, contribute to the enhancement of deeper learning skills. The research examines the perception of teaching methods that promote collaboration, critical thinking, creativity and communication, and compares practices in Germany with those in India. Pre-service teachers reflect on the impact of their international placements and describe the strategies and methods they plan to integrate into Indian classrooms. The findings underscore the potential benefits of international exposure in cultivating a holistic approach to education, diverse teaching methods and enhancing the cognitive skills of future educators in India.

KEYWORDS: Deeper learning; EDUREFORM; 21st-century skills; Teacher training.

Introduction

In the swiftly evolving landscape of education, where the Fourth Industrial Revolution beckons transformative changes, the need for a nuanced and adaptable approach to teaching is more critical than

¹ Wilko Reichwein: contributed to conceptualizing the paper, drafting data collection tools, drafting the manuscript, and analyzing and interpreting the quantitative data. Nidhi Waldia: contributed to drafting the manuscript, compiling related background literature, analyzing and interpreting qualitative data. All authors have read, reviewed and approved the final manuscript.

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ever. As technological advancements reshape the nature of work, the EDUREFORM project emerges as a proactive response, strategically designed to empower secondary school teachers in India with the skills imperative for navigating the challenges of the future. Central to this initiative is the incorporation of 21st-century skills, emphasizing critical, creative, and analytical thinking, in the educational fabric.

This research paper delves into the profound experiences of Indian pre-service teachers during their teaching internships in German gymnasiums, specifically Gymnasium Hochrad and Gymnasium Rissen in Hamburg, Germany. As participants in the EDUREFORM project under the Erasmus+ program, these teachers-in-training undergo a cross-cultural immersion, offering a unique opportunity to enhance their Deeper learning competencies. Through insightful interviews with six participants, this study meticulously examines the impact of international exposure on the development of collaboration, critical thinking, creative thinking, and communication skills among the Indian educators.

Technological developments, such as the spread of generative artificial intelligence, increase the urgency to think about the right type of learning. One promising concept is the pedagogical approach of deeper learning. The aim of this approach is for learners to engage deeply with the acquisition of knowledge in order to solve complex new problems with the knowledge they have acquired (Pellegrino & Hilton, 2012, p. 5). It is therefore a matter of transferring learned skills to other new complex tasks. For this kind of problem solving, teaching is often designed in such a way that, in addition to a deep engagement with the acquisition of knowledge, the future skills of the 21st century are particularly promoted. There are different views on what exactly these skills are, but in recent years the so-called 4C skills have emerged as particularly important (Bialik & Fadel, 2015; OECD, 2018, p. 5). These include communication, creativity, critical thinking and collaboration.

Against the backdrop of the EDUREFORM project's strategic alignment with the Fourth Industrial Revolution, this research paper navigates the nuanced terrain of global competence development. By comparing teaching methodologies in Germany and India, the study not only unveils effective strategies for fostering 21st-century skills but also explores the participants' reflections on the tangible contributions of their international placements. As the findings unfold, a compelling narrative emerges, underscoring the potential of international exposure in cultivating a holistic educational approach, diverse teaching methodologies, and the cognitive skills indispensable for the future educators of India.

This paper seeks to contribute meaningfully to the ongoing discourse on globalizing teacher education, emphasizing the invaluable role of international internships in shaping educators equipped to guide students through the complexities of the contemporary world.

1. The EDUREFORM Project

The EDUREFORM Project, a 3-year long project funded by Erasmus+ program of the European Union, is a strategic response to the transformative wave of the Fourth Industrial Revolution (4IR), marked by the convergence of artificial intelligence, robotics, and the Internet of Things. Recognizing the potential disruption this technological storm poses to the fabric of societies, particularly in terms of employment and societal divisions, the project aims to empower secondary school teachers, both in-service and pre-service, in India with skills to promote critical, creative, and analytical thinking skills of the secondary school students. In the face of alarming projections, such as the estimated 57% of jobs at risk of automation (Citi & Oxford Martin School, 2016) and the potential replacement of 800 million jobs by artificial intelligence by 2030 (McKinsey Global Institute, 2017), EDUREFORM takes a proactive stance. It acknowledges the contrasting impacts of automation and robotics on different economies and highlights the seismic shift that India, with its high labor density and under-skilled workforce, is likely to experience in its labor market. Central to the project is the understanding that education and skills development are pivotal in navigating the «man or machine» debate. The need for immediate curricular adjustments, combining traditional education with e-learning, becomes apparent. The focus on soft skills, such as critical, analytical, and creative abilities, is underscored, anticipating a shift in labor demand from routine problem-solving to sophisticated problem-analysis skills.

EDUREFORM recognizes that the educational landscape must evolve rapidly to keep pace with the changing demands of the job market. It highlights the role of civic organizations and private firms in supporting governments and fostering a moral obligation to educate and train the workforce for the future. Notably, higher education is identified as a crucial player in preparing society for impending changes, emphasizing the significance of timing and systemic adjustments. The project envisions the inclusion of teaching practices that foster critical, creative, and analytical thinking. To promote its aim, the EDUREFORM Project facilitates the international mobility for the trainee teachers of Shivaji University, Savitribai Phule Pune University, the Maharaja Sayajirao University of Baroda and Chitkara University to EDUREFORM consortium partner institutes both in Indian and Europe. During the mobility, students got an opportunity to use and improve their pedagogical skills.

2. Competences for Deeper Learning

In the 21st century, humanity faces significant challenges at societal, economic, and personal levels. Economically, the dynamics of globalization and rapid innovation demand a workforce equipped with adaptive skills. Pre-service teachers, as the architects of future learning environments, must instill in their students the ability to think critically about evolving business paradigms and to communicate effectively within a global context. By incorporating these skills into their own teaching practices, educators model the essential competencies needed for success in an ever-changing economic landscape. On a personal level, individuals are confronted with the daunting task of finding fulfillment and happiness amid the disruptions caused by technology's exponential growth. Pre-service teachers play a pivotal role in nurturing creativity, encouraging students to explore innovative solutions to personal and societal challenges. Moreover, by fostering critical thinking, educators empower students to analyze and adapt to the consequences of automation and offshoring, preparing them for diverse employment opportunities and equipping them with the resilience to thrive in an uncertain future. The interconnectedness of these challenges underscores the necessity for pre-service teachers to champion collaboration both within the classroom and beyond. By embracing collaboration, educators model the impor-

tance of working together to solve multifaceted problems, imparting this crucial skill to their students. In doing so, pre-service teachers contribute to the development of individuals capable of engaging in collaborative efforts that extend beyond the classroom and address the broader issues facing society. Therefore, it is important to move beyond knowledge and foster the skills necessary for a 21st-century education: creativity, critical thinking, communication, and collaboration (4 C's) (Bialik & Fadel, 2015). Through a curriculum centered on 4 C's, pre-service teachers become catalysts for positive change, guiding their students towards a future characterized by adaptability, resilience, and a commitment to collective progress. These abilities can be said as Deeper learning competencies. Deep learning in humans refers to the process of acquiring complex knowledge and skills through experience (Alharbi & Rashid, 2022). It's a concept that draws parallels with deep learning in artificial intelligence (AI), where machines learn from large amounts of data. MacFarlane et al. (2017) stresses the significance of incorporating deep learning into the education system to equip future graduates with the skills needed to seize diverse economic opportunities on a global scale in the 21st century.

The report Deeper Learning Improving Students' Outcomes for College, Career, and Civic Life (Bitter & Loney, 2015) emphasizes the benefits of developing Deeper Learning Competencies (DLC) in students. These include cognitive aspects such as a profound understanding of learned material, practical application of knowledge, enhanced critical thinking, problem-solving skills, and increased creativity. Interpersonal benefits involve improved communication and collaboration skills, while intrapersonal aspects encompass the ability to self-teach, active engagement in learning activities, strong motivation, self-belief, productivity, and persistence. The report draws on the work of the Hewlett Foundation (2013) and Trilling (2010) to support these findings. Developing DLC equips students to face future workforce challenges by fostering a deep understanding of their studies and the practical application of knowledge in real-life situations. Additionally, deeper learning enables students to collaborate effectively in teams, access career opportunities, and enhance critical thinking skills to address real-world problems.

The research conducted by Prianto, Qomariyah, and Firman (2022) suggests that implementing four practical activities – practice-based learning, internships, problem-based learning (PBL), and

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simulated business environments (SBE) – enhances student engagement in learning. This involvement is manifested through aspects such as active participation, the commitment of students to tasks, their attention and interest in practical learning, the emotions expressed during such activities, and the independence demonstrated in learning. The adoption of these practical learning activities not only develops various skills and positive attitudes, including academic skills, practical competencies, learning strategies, work attitudes, career orientation, work readiness, collaboration, and communication but also contributes to the cultivation of Deeper Learning Competencies (DLC).

The study establishes that student participation in these practical learning activities has a significant impact on fostering DLC, which comprises essential competencies required for students to navigate real-world challenges post-graduation. These competencies encompass mastering core academic content, critical thinking, collaborative work, effective communication, autonomous learning, and maintaining an academic mindset. To reinforce students' DLC, the research emphasizes the importance of integrating theory and practice in a cohesive series of learning activities where the elements are inseparable. The findings highlight the significance of practical learning experiences in shaping students' deeper learning capabilities.

3. Student Mobility Program in Hamburg

Two grammar schools from Hamburg took part in the exchange program. One was Gymnasium Hochrad, which is one of the largest grammar schools in Hamburg with currently 1,158 pupils, and the other was Gymnasium Rissen, which is significantly smaller with 629 pupils. Both schools cover grades 5 to 12 and graduate with the Abitur which prepares the students for university studies. In addition to the grammar schools, there is another speciality in Hamburg: the district schools, where pupils can complete their Abitur after 13 years of schooling, but can also leave after 9 years to start a vocational training. The two grammar schools are mainly attended by the higher-achieving pupils and the individual classes are relatively homogeneous.

Gymnasium Hochrad offers bilingual teaching as a specialism from year five onwards. This means that English is used as a working

language in various subjects and that English is not only taught as a single subject. Gymnasium Rissen specializes in the areas of language, STEM education and sport. Some subjects are also taught bilingually in Rissen. The Indian student teachers completed a school placement at these two schools from 28 August to 15 September 2023, with three students at Gymnasium Rissen and four at Gymnasium Hochrad. The concept of the school internship was very similar to the normal school internships for student teachers in Hamburg. In accordance with the subject specializations, timetables were drawn up in advance or together with the students, in which they observed different teachers or classes in different year groups and were also able to gain their own teaching experience later on. There were contact persons at the schools who took over the supervision of the Indian students. It was also possible to visit extracurricular school activities like a school concert. Table 1 shows the students' work shadowing program at Gymnasium Hochrad.

| | Monday | Tuesday | Wednesday | Thursday | Friday |
|--------------------------------|----------------------------------|-------------------------------------|-------------------------------------|---------------------------------|-----------------------------|
| 1./2. 07:50 - 9:20 a.m. | - | - | - | Engl. 12 (Rw) Room: H7 | Engl. 9c (Rn) Room: OS3 |
| 3./4. 09:45 - 11:15 a.m. | Bio II (Bös) Room: NVV2 | Science 9 (Bös) Room: OS I | Engl. 5d (Rn) Room: B5 | Bio 7a (Rn) Room: NVV4 | Bio 12 (Gr) Room: NW3 |
| 5./6. 1:40 - 3:15 | Bio 7c (Rn) Room: NW5 | Science 5d (Rn) Room: NVV2 | Engl. 6f (Gr) Room: C6 | - | - |
| 7. hr. 13:25- 14:10 | - | - | Science 5e (Rw) Room: NVV4 | - | - |
| 8./9. 4:15 - 5:45 | Bio 10c (Bös) Room: NW3 | Bio 8d (Rn) Room: NW4 | - | Bio II (Bös) Room: NW5 | - |

Table I. A typical weekly schedule during the school internship in Hamburg

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In addition to working at the schools, the students had some time to visit Hamburg and the surrounding area and familiarize themselves with the cultural particularities. The student mobility program also included a harbor tour, a city tour and a welcome event at the University of Hamburg.

4. Research Question

The central research questions were developed on the basis of the theoretical explanations on Deeper Learning Competences. The research questions are an important part of the research process and guide the further research (Ratan *et al.*, 2019, p. 15). The questions relate to the experiences and observations of the Indian students in the two grammar schools during the three-week school internship. They were the basis for the collection of both qualitative and quantitative data. Overall, this study is based on four research questions:

- 1. What methods and concepts have been observed in the classroom that support the development of Deeper Learning Competences and how does the situation compare in India?
- 2. How do Indian students assess their own competence growth in teaching Deeper Learning Competences?
- 3. What new ideas and concepts do the Indian students take back to India to apply in the classroom?
- 4. What do the Indian students miss in grammar schools in Hamburg compared to India?

5. Description of the Sample

Under the EDUREFORM Program, 7 students from 4 Indian Universities (2 from Savitribai Phule Pune University, 1 from Chitkara University, Chandigarh, 2 from Shivaji University and 2 from Maharaja Sayajirao University of Baroda) studying in graduate and postgraduate teacher education programs got an opportunity to pursue a 3-week short-term teacher internship at two German Gymnasiums. The students come from different socio-economic groups, two from urban Maharashtra, two from rural Maharashtra, one from urban Gujrat, one from West Bengal and one from Chandigarh. All 7 students responded to the drafted questionnaire. The demographic profile of the respondents in the research paper can be summarized as follows:

Age Distribution:

- Under 23 years: 1 respondent
- 24 28 years: 3 respondents
- 29 34 years: 2 respondents
- 35 39 years: 1 respondent

The students surveyed have completed or are about to complete various academic degrees. 5 students already have a Master's degree in either Education or Science. One student has a Cambridge CELTA Certificate and one student is just completing their B.Sc. B.Ed. Course, after finishing the 12th grade at a college. The subjects studied also cover a broad spectrum. Most students have studied English and an additional natural science subject such as Zoology, Botany or Biology. Occasionally, Education or Economics was also named as a specialization.

This demographic represents a diverse group with varied age ranges, academic qualifications, and fields of study, providing a rich dataset for the research paper. The educational backgrounds include language teaching, English literature, commerce, science, and education, contributing to a comprehensive understanding of the respondents' perspectives and experiences.

6. Methodology and Data Analysis

Basically, this paper is in the field of empirical educational research with a focus on a cross-country comparison between Germany and India. It is structured as a small mixed-methods study with qualitative and quantitative data collection. This research strategy is a concurrent procedure in which the researcher converges quantitative and qualitative data to provide a comprehensive analysis of the research problem (Creswell, 2003, p. 16). The focus of this study is on qualitative data collection as this is the most appropriate way to capture perceptions in their complexity. Compared to a purely quantitative study, it allows the perceptions, experiences and perspectives of individual participants to be explored in detail and with precision. This is a major advantage of this type of research approach (Rahman, 2017, p. 104). By adding quantitative data, the research questions can be analyzed from a different perspective and the informative value of the qualitative data can be increased.

The data collection instrument was an online questionnaire, as this method allows data to be collected independently of time and place. The questionnaire was divided into four sections. The first part dealt with the biographical data of the respondents, including their age, highest level of education and subjects studied. The second part contained questions about the perception of 21st-century skills (critical thinking, collaboration, creative thinking and communication skills) in the classroom, including sub questions about the comparison with India. After the second qualitative part of the questionnaire, the third part consisted of four items to record the personal assessment of whether the internship had improved their own teaching skills in the area of 21st-century skills. For this purpose, a 5-point Likert scale was used with 5 levels (1=strongly disagree, 2=disagree, 3=neither agree nor disagree, 4=agree and 5=strongly agree).

The fourth and last part contains two open-ended qualitative exploratory questions about methods and concepts that they would like to bring from Germany to the Indian classroom and vice versa. For all qualitative questions there was no space limit for answers.

A method based on Mayring's (2014) qualitative content analysis was used to evaluate the qualitative data. For the structured analysis, the categories for the second part of the questionnaire were formed deductively on the basis of the questions. For the data from the last part of the questionnaire, additional inductive evaluation categories were formed due to its exploratory nature.

Standardized descriptive statistical methods were used for the quantitative data.

7. Results

In this section, we present the findings derived from the analysis of data collected through an online questionnaire and insightful interviews with Indian pre-service teachers participating in the EDUREFORM project during their teaching internships in German Gymnasiums. First, the qualitative data is presented using various categories. The categories have been derived from the questions and correspond to the 21th century skills of deeper learning.

7.1. Collaboration Skills

In the two German gymnasiums Content and Language Integrated Learning (CLIL) is a significant strategy used to foster collaboration skills, emphasizing instruction in subjects like science and history in a second language. Cooperative learning in an international context is another crucial approach, requiring students to work collaboratively in groups to solve problems or complete tasks. Bilingual education and various activities, such as debates and chess tournaments, contribute to enhancing collaboration, communication, and critical thinking skills. Student-friendly classroom arrangements and a culture of listening to each other's opinions promote a collaborative environment. In comparison with Indian educational practices both Germany and India recognize the importance of fostering collaboration skills, with CLIL being a common strategy in both countries. Indian classrooms also use cooperative learning, group activities, and project-based assessments to promote effective collaboration. The emphasis on a learner-centric approach and the use of technology for collaboration are common goals in both countries. While both countries emphasize teamwork, Germany's focus on «cooperative learning» and «learning fields» reflects a structured approach to fostering collaboration. India also values collaborative learning, but the methods can vary, often influenced by the different education systems in different states and institutions. Both countries aim to equip students with essential teamwork skills for their future endeavors.

7.2. Critical Thinking

In the German gymnasiums these strategies include clear instruction, effective questioning, collaborative learning, real-world scenarios, active learning, and reflective thinking. Gymnasium Hochrad

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focuses on creating a supportive environment for open discussions and encouraging students to consider multiple perspectives. Inquiry-based learning, discussions, and problem-solving activities are used to stimulate critical thinking. In comparison with Indian educational practices in classrooms also employ strategies like active learning, group discussions, and project-based learning to promote critical thinking. The emphasis on problem-solving, inquiry-based learning, and real-world scenarios aligns with global trends in both countries. However the discussion method is used less in India comparatively and questions are asked by the teachers rather than the peers. It is noticeable again that in German classrooms often integrate a more structured approach to critical thinking, while in India, teachers may have different practices influenced by regional differences in education systems. Nonetheless, both nations value the cultivation of critical thinking skills.

7.3. Creative Thinking

In German schools, effective questioning, meaningful interactions, learner-centered environments, problem solving and panel discussions are methods used to stimulate creative thinking. Language teaching through activities like story writing, role playing and debates are integrated to enhance language skills and creative thinking. Compared to Indian educational practice, both Germany and India promote creative thinking through similar methods such as project-based learning, brainstorming and artistic activities. Cultural and educational differences may influence the specific implementation. Overall, however, the commitment to developing creative thinking skills is a common goal in the educational landscapes of both countries. In India they celebrate science day where students create their own scientific models, there are drawing competitions, essay competitions and more.

7.4. Communication Skills

In German Gymnasiums, creating a safe atmosphere, encouraging collaboration, teacher positioning, active listening exercises and positive reinforcement all contribute to improving communication skills. Class discussions, debates, presentations and written assignments are common methods used to develop students' communication skills. Compared to Indian educational practice, Indian classrooms use similar strategies, including active learning, group discussions and integration of technology, to enhance communication skills. An emphasis on problem solving, critical thinking and life skills is common to both countries. In some cases, Indian students may be much better at expressing themselves in communication, presenting thoughts, and communicating in their mother tongue. They speak different languages.

7.5. Internship Impact and Takeaways

The intern feels that the school placement in Germany will contribute significantly to promoting collaboration, critical thinking, creative thinking and communication skills in Indian classrooms. Specific ideas and concepts to be implemented in India include a learner-centered approach, active participation, teacher as facilitator, positive reinforcement, effective questioning, use of technology and a focus on cognitive learning. The intern suggests some improvements for the Hamburg grammar schools to promote a more inclusive and diverse learning environment in the schools. There's a desire for more emphasis on sustainable and environmental education, alignment with global priorities and the development of responsible global citizens.

The intern misses the students' presentations, interactions, and learning styles in Hamburg schools. Interactive teaching-learning methods, social activities, and collaboration with other cultures are aspects the intern would love to see more of. The intern suggests promoting sharing among students in schools to instill values of collaboration and fun learning. Weekly competitions and activities are recommended to enhance engagement and promote enjoyable learning experiences.

7.6. Analysis of the Quantitative Data

The results of the descriptive quantitative analysis (**Table 2**) shows a very clear result. In all 4 items the mean score is better than

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4.714 and the standard Deviation is under 0.488. These values show very clearly that, from the students' point of view, the internship was a great support in promoting their 21 century skills.

It remains to be analyzed why these results are so clear. It is possible that the school internship was perceived very positively by the students overall, so that this very positive impression was reflected as well in the assessment. Another factor that could have distorted the results is that social desirability played a role in the answers. This means that respondents prefer to give answers that they believe are more likely to meet with social approval than the true answer, which they fear social rejection.

But in summary, the objective quantitative results suggest that Indian students participating in internships in German gymnasiums have generally excelled in developing Deeper Learning Competencies. The positive outcomes in collaboration, critical thinking, creative thinking, and communication skills demonstrate a well-rounded skill set acquired through the internship experience. The convergence of quantitative and qualitative data provides a comprehensive understanding of the transformative journey experienced by Indian pre-service teachers during their international exposure.

| Descriptive Statistics | | | | | |
|------------------------|-------------------------|-------------------|----------------------|-------------------------|--|
| | Collaboration Skills | Critical Thinking | Creative Thinking | Communication Skills | |
| Valid | 7 | 7 | 7 | 7 | |
| Mean | 4.714 | 4.857 | 4.714 | 4.857 | |
| Std. Deviation | 0.488 | 0.378 | 0.488 | 0.378 | |
| Minimum | 4.000 | 4.000 | 4.000 | 4.000 | |
| Maximum | 5.000 | 5.000 | 5.000 | 5.000 | |

Table 2. Do you think this school internship will help me to promote [...] between the students in the class (1=strongly disagree, 2=disagree, 3=neither agree nor disagree, 4=agree and 5=strongly agree)?

8. Discussion and Conclusion

The evolving landscape of work, driven by new technologies such as artificial intelligence and robotics, necessitates a shift in the skills required for future employment. To prepare students for these changes, a focus on 21st-century skills is crucial. This research paper explores the transformative impact of international exposure on Indian pre-service teachers during their teaching internship in German gymnasiums as part of the EDUREFORM project under the Erasmus+ program. Through interviews with six participants, the paper investigates how experiences at Gymnasium Hochrad and Gymnasium Rissen in Hamburg, Germany, contribute to the enhancement of deeper learning skills, specifically collaboration, critical thinking, creative thinking, and communication. The research also examines the perception of teaching methods that promote these skills, comparing practices in Germany with those in India.

The findings of the study highlight the positive impact of international exposure on the development of Deeper Learning Competencies among Indian pre-service teachers. The mean scores for collaboration, critical thinking, creative thinking, and communication skills are consistently high, suggesting a strong performance by the students during their internships. The narrow standard deviations and the limited range between minimum and maximum scores indicate a consistent and uniform development of these competencies among the participants. The EDUREFORM project's strategic response to the Fourth Industrial Revolution emphasizes the importance of equipping teachers with skills to promote critical, creative, and analytical thinking among secondary school students. The study underscores the significance of international mobility programs, such as the one facilitated by EDUREFORM, in providing valuable experiences for future educators. The focus on 21st-century skills, including collaboration, critical thinking, creative thinking, and communication, aligns with the global need for a workforce capable of adapting to the changing demands of the job market. The research further delves into the competences for deep learning, emphasizing the interconnected challenges at societal, economic, and personal levels. The 21st-century skills become essential not only for economic adaptability but also for personal fulfillment amid technological disruptions. The study emphasizes the role of pre-service teachers in modeling these competencies through their own teaching practices.

The section discussing the student mobility program in Hamburg provides insights into the specific experiences of Indian students at Gymnasium Hochrad and Gymnasium Rissen. The comparison of teaching methods between Germany and India highlights the diverse strategies employed to promote deep learning competencies. The research questions, based on theoretical explanations of Deeper Learning Competences, guide the exploration of students' experiences and observations during their internships. The demographic profile of the participants reflects a diverse group with varied age ranges, academic qualifications, and fields of study. This diversity contributes to a comprehensive understanding of the respondents' perspectives and experiences, adding richness to the research dataset. The methodology and data analysis section explains the mixed-methods approach employed in the study, combining qualitative and quantitative data collection. The use of an online questionnaire and the application of Mayring's qualitative content analysis offer a structured yet detailed exploration of participants' perceptions. The results section provides a thorough discussion of the promotion of collaboration, critical thinking, creative thinking, and communication skills in German gymnasiums, along with a comparison with educational practices in India. The impact of the internship on the participants and their takeaways, as well as their suggestions for enhancements and missed aspects, are presented in a comprehensive manner.

In conclusion, the research paper contributes valuable insights into the potential benefits of international exposure in cultivating a holistic approach to education, diverse teaching methods, and enhancing the cognitive skills of future educators in India. The positive outcomes observed in collaboration, critical thinking, creative thinking, and communication skills underscore the importance of such international mobility programs in preparing teachers for the challenges of the 21st century. The findings provide a foundation for future research and emphasize the need for continued efforts in integrating global perspectives into teacher education programs. 6. Promoting Deeper Learning Competencies in the Classroom • 139

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7.

Predictors of Nature Connectedness among Indian and Latvian Young Adults¹

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ABSTRACT

In the context of socio-economic transformations driven by rapid technical progress, the imperative to cultivate deeper learning practices is paramount. Concurrently, the escalating challenge of climate change necessitates a reconnection between humanity and the natural world. The study investigates predictors of nature connectedness among young adults in India and Latvia, emphasizing the relevance of eco-friendly practices and emotional intelligence within Education 5.0. Through quantitative and qualitative analyses, the pivotal role of emotional intelligence in fostering nature connectedness, underlining the urgency of integrating sustainable behaviors into educational frameworks was revealed.

KEYWORDS: Climate change; Emotional intelligence; Materialism; Nature connectedness; Young adults.

Introduction

As our world undergoes rapid socio-economic transformations fueled by technological advancements, the call for deeper learning practices becomes increasingly urgent. In the midst of these changes, the relationship between humanity and the natural world has grown strained, presenting profound challenges such as climate change. Recognizing the importance of rekindling our connection with nature, this study explores the intersection of emotional intelligence, materialism, and nature connectedness within the framework of Education 5.0.

Nature connectedness is not merely a luxury but a necessity for human well-being. Research reveals a profound correlation between

¹ Jotika Judge and Anna Stavicka equally worked on the conceptual framework of the research, qualitative data collection, analysis and interpretation, jointly elaborating the conclusions.

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nature connectedness and subjective happiness, emphasizing its pivotal role in lives. In the context of Education 5.0, emotional intelligence emerges as a guiding light, illuminating the path towards a deeper connection with nature. Through nurturing our emotional intelligence, we cultivate the empathy and self-awareness needed to forge meaningful bonds with the natural world. However, in a world driven by consumerism and materialism, the pursuit of wealth and possessions often obscures the connection to nature. Yet, the material wealth alone cannot fill the void within our souls. Instead, it is our emotional wealth - our capacity for empathy, compassion, and love – that holds the key to unlocking the true richness of life. The study yields unexpected insights as we delve into the lives of young adults in India and Latvia. Through quantitative analysis and qualitative interviews, the profound impact of emotional intelligence and cultural heritage on nature connectedness was uncovered. While statistical analyses revealed positive correlations between emotional intelligence and nature connectedness, qualitative interviews unveiled the enduring influence of cultural traditions on individuals' attitudes towards nature. It is apparent that nurturing our emotional intelligence and embracing our cultural heritage are essential steps towards fostering a deeper connection with nature. In the ever-changing landscape of our world, Education 5.0 emerges as a beacon of hope, guiding us towards a future where humanity and the natural world thrive in harmony.

In an era marked by rapid socio-economic transformations driven by technological progress, the imperative to cultivate deeper learning practices has never been more pressing. As our world becomes increasingly interconnected and complex, Education 5.0 emerges as a beacon of innovation, emphasizing holistic development and the cultivation of essential skills beyond traditional academics.

At the heart of Education 5.0 lies a recognition of the intrinsic connection between nature connectedness, emotional intelligence, and effective learning. In a society where the pace of life can often be overwhelming, fostering a deep sense of connection with the natural world becomes essential for maintaining balance and well-being. Research has shown that individuals with higher levels of nature connectedness tend to experience greater subjective well-being and happiness, underscoring the importance of integrating nature-based learning experiences into educational curricula. Similarly, emotional intelligence plays a pivotal role in Education 5.0 by empowering learners to navigate complex social dynamics, manage stress, and cultivate empathy and resilience. By fostering emotional intelligence skills such as self-awareness, self-regulation, and social awareness, Education 5.0 equips students with the tools they need to thrive in an increasingly diverse and interconnected world.

In essence, Education 5.0 recognizes that effective learning goes beyond the acquisition of knowledge; it encompasses the cultivation of essential life skills and a deep connection with the natural world. By embracing nature connectedness and emotional intelligence as foundational principles, Education 5.0 paves the way for a more holistic and sustainable approach to education that prepares learners to thrive in the face of socio-economic transformations and technological progress.

Human beings frequently perceive themselves as indomitable entities amidst the myriad of living species on this planet. Nevertheless, the reality remains that we are inherently intertwined with the natural world, cohabiting with it, and despite our endeavors, we have yet to assert absolute control over its intricate workings. Be it dealing with natural disasters or modifying our living conditions with changing seasons, climatic conditions, it is human beings who make adjustments in accordance with natural occurrences. All of our evolution in itself has been a result of making sense and our way through the natural world around us. However, as the human societies have progressed over centuries moving from pre-industrial age to industrial age and now to technological age, judicious use of mother nature's abundance and resources have often been ignored on individual as well as on levels of policy making. During the course of growth and development, our sense of identity as integral components of the natural world became compromised. Consequently, we find ourselves ensconced in the throes of a climate change crisis, marked by a protracted alteration in the Earth's temperature and weather patterns. Notably, this crisis is not attributable to natural phenomena such as solar activity or volcanic eruptions; rather, it is an outcome of human actions, or more precisely, misguided interventions towards the natural environment.

Global organizations like United Nations (UN) and Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Ser-
vices (IPES) that are working in the area of climate change have recognized failing human-nature connection as the fundamental reason of the ongoing environmental crisis. This human-nature connection depends on how people connect with their natural world and there is a measurable psychological construct that assesses this feeling of connection. Nature connectedness can be defined as «the extent to which an individual includes nature within his/her cognitive representation of self. It is a self-perceived relationship between the self and natural world» (Schultz, 2022) and has been found to have causal relationship with pro-environmental behaviors and well-being (Richardson *et al.*, 2022). It is associated with stronger belief in the climate change crisis (Wang et al., 2019), perception of risk associated with climate change (Bradley et al., 2020) and climate change anxiety and worry (Clayton & Karazsia, 2020). Climate change concern has been identified as a catalyst, prompting individuals to engage in proactive measures addressing climate change (Curll et al., 2022).

Nature connectedness is not solely associated with diverse aspects of climate change but also exerts a positive influence on individuals' physical, psychological, and emotional well-being. Research has found that increased levels of nature connectedness can improve overall health by increasing subjective feelings of happiness (Capaldi et al., 2014). Being in nature has been found to have a calming effect on the nervous system as it activates the parasympathetic nervous system which is linked with feelings of contentment while the urban environment stirs sympathetic nervous systems which are related to drive and threat (Van den Berg et al., 2015). Positive impact of connectedness to nature is even visible if an individual is exposed to nature virtually, invoking positive emotions like awe, gratitude, wonder, reverence which leads to improved psychological and physical well-being (Piff et al., 2015). However, the effect of nature on well-being is not as impactful on momentary mood and subjective well-being measures as it is on various eudemonic measures of well-being (Passmore & Howell, 2014). Various benefits of nature connectedness make it necessary to explore various psychological and psycho-social factors that are related to this construct. With decreasing levels of nature connectedness among the younger population – nature connectedness declines as an individual enters adolescent years (Krettenauer, 2020) -, such factors can be used as bridges to narrow down the declining nature connectedness especially among younger population.

The study explored two such factors, namely, materialism and emotional intelligence as correlates and predictors of nature connectedness among young adults. Materialism can be viewed as a value that influences the way that people interpret their environment and structure their lives. It is the importance one places on ownership and acquisition of material goods in achieving major life goals or desired states (Richins & Dawson, 1992). It is often believed that materialism leads to exploitation of natural resources and a neglectful attitude towards nature and environment. A paradox is inherent in financial wealth, affording individuals a stake in resources. However, the conundrum arises as the accumulation of wealth often translates into increased expenditure on material goods and frivolous services. thereby escalating the likelihood of environmental and climate degradation (Barbara, 2021). Limited research has delved into the connection between nature connectedness and materialism. However, among the studies that have delved into this association, a consistent finding emerges – a negative correlation between the two (Joye, 2020; Aruta, 2021; Aruta & Ballada, 2022; Wang & Huo, 2022). Various other facets such as environmentalism (Banerjee & McKeage, 1994), environmental concern (Kilbourne & Pickett, 2008), pro-environmental attitude (Gu et al., 2020) closely related to nature connectedness have also been found to have negative correlation with materialism. Materialism also negatively influences the perception and attitude towards the climate change crisis. Even in situational instances materialism has been found to increase the skepticism about climate change among individuals (Vasquez et al., 2021).

Emotional Intelligence defined as «the ability to monitor one's own and others' feelings and emotions, to discriminate among them and use this information to guide one's thinking and actions» (Salovey & Mayer, 1990) is the second variable being explored in relation to nature connectedness in the present study. There is a lack of research exploring the relationship between emotional intelligence and the construct of nature connectedness. However, Gerofsky (2016) found that trait emotional intelligence is positively linked with nature relatedness. The link between emotional intelligence and pro-environmental behavior was explored by Aguilar-Luzon *et al.* (2014) and it was found that interaction between emotional intelligence and environmental beliefs impacts recycling attitudes, intentions and behavior among undergraduate students. There has also been found a positive relationship between emotional management control and understanding others' emotions, dimension of emotional intelligence and pro-environmental behaviors. Adolescents' emotion management, control and understanding skills impact the level to which their pro-environmental attitude will impact the pro-environmental behavior (Robinson *et al.*, 2019). Emotional intelligence is also found to impact environmental behavior at workplace settings, as emotionally intelligent employees use their intelligence to assess various environmental issues and make decisions about their responsibility of preserving the environment (Aziz *et al.*, 2018).

Various research in the realm of nature connectedness highlights its positive impact across multiple dimensions of health – physical, psychological, and emotional. It underscores the interconnectedness of concepts such as pro-environmental behavior, beliefs, attitudes, and nature relatedness, illustrating their associations with materialism and emotional intelligence. Nevertheless, a paucity of studies exists that have systematically examined the nexus between the specific construct of nature connectedness and materialism, as well as emotional intelligence. Furthermore, these variables have yet to be thoroughly investigated as predictors of nature connectedness. With this in mind, the present study will focus on the following objectives:

- To explore the relationship between nature connectedness, materialism and emotional intelligence among Indian and Latvian young adults;
- To delineate predictors of nature connectedness among Indian and Latvian young adults;
- To analyze differences on nature connectedness, materialism and emotional intelligence among Indian and Latvian young adults;
- To explore cultural values and traditions related to nature/ natural world that are followed by Indian and Latvian young adults;
- To ascertain the factors that are considered important by Indian and Latvian young adults to increase nature connectedness among individuals.

1. Method

Survey as a research method and tests, group interviews and indepth interviews were applied as the data collection methods. The research sample for the present study were university students. Out of which 100 participants were selected through snowball sampling technique. The research sample for quantitative analysis was 50 young adults from India and Latvia. For quantitative analysis, correlation and regression analysis was performed applying SPSS.

The respondents studying at university level (undergraduate & postgraduate levels) were included. Standardized questionnaires were used for data collection. In addition, a qualitative analysis was conducted through on line group interviews, involving 6 Indian students and 11 Latvian students. Furthermore, interviews with teachers were carried out, with 4 respondents from Latvia and 1 respondent from India.

Connectedness to nature scale (Mayer & Frantz, 2004) was applied to measure nature connectedness among youth; materialism was measured by using Youth Materialism Scale (Goldberg *et al.*, 2003); and for assessing emotional intelligence Schutte's emotional intelligence scale (Schutte *et al.*, 2009) was used.

Amidst the evolving socio-economic landscape, the necessity for deeper learning practices is highlighted, with Education 5.0 emerging as a guiding paradigm. Within this framework, the Connectedness to Nature Scale, developed by Mayer and Frantz in 2004, serves to measure individuals' affinity with nature across 14 items. Similarly, the Material Values Scale by Richins (2004) reflects attitudes towards material wealth through nine concise items. Additionally, Schutte's Emotional Intelligence Scale (2009) explores the nuances of empathy and self-awareness through 33 items. Together, these instruments illuminate the interconnectedness of nature connectedness and emotional intelligence within the educational context, guiding towards a future where knowledge is deeply integrated into the human experience.

2. Results

One of the objectives of study was to find the relationship between nature connectedness, materialism and emotional intelligence.

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The correlation analysis shows that emotional intelligence is (r=.68**, $p \le 0.01$) positively related with nature connectedness while there is no significant relationship between nature connectedness and materialism (r=.12) among Indian young adults.

Another objective was to delineate the predictors of nature connectedness among Indian and Latvian young adults. Variables (i.e. materialism and emotional intelligence) were entered as predictors. The regression analysis revealed that only emotional intelligence (β =0.68) turned out to be a relevant predictor of nature connectedness among Indian young adults. It explained 46% (R2=0.46) of the variance in the criterion variable (nature connectedness).

| Predictor Variables | Standardized Coefficient | t-value | R2 | F-value |
|------------------------|-----------------------------|---------|-------|---------|
| Materialism | 0.12 | 0.85 | 0.015 | 0.73 |
| Emotional Intelligence | 0.68 | 6.46 | 0.46 | 41.83** |

** Significant at p≤ .01 level

Table I. Values From the Regression Analysis

A supplementary objective of study was to explore cultural values and traditions related to nature/natural world that are followed by Indian and Latvian young adults. Following table shows the summary of major cultural values/family traditions shared by Indian and Latvian young adults that make them feel connected to nature.

| S. No. | Cultural Value/Family Traditions connected to Nature | | |
|--------|--|--|--|
| 1 | In my household, we plant trees to stay connected to nature, we also do morning walk to ensure connection with nature plus it also provides health benefits. | | |
| 2 | Planting trees on birthday. | | |
| 3 | Yes we do certain practices like giving water to plants as a part of rituals, we also keep surrounding clean as it means the god will stay at our house. | | |
| 4 | Tulsi worship. | | |
| 5 | Gardening, feeding birds and stray animals, meditating in the morning with the bliss of sunlight. | | |

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| 6 | On my birthday my father plant a tree and we water them regularly. |
|----|---|
| 7 | We go to village at vacations where I feel close to nature. |
| 8 | Tulsi Vivah in which the plant of Tulsi is married with lord Vishnu. |
| 9 | We pray to a plant called Tulsi and it's like a goddess which keeps peace and prosperity in the house. |
| 10 | Govardhan pooja. In this we made sculpture of God made with cow dung and worship them. After next day of pooja this whole cow dung then dumps into the plants for their growth. |

Table 2. Cultural Value and Family Traditions connected to Nature

3. Group Interview with Students and Interview with Teachers

The group interview aimed at elucidating cultural values, traditions, and individual experiences pertaining to nature connectedness, materialism, and emotional intelligence among young adults in India and Latvia. With the participation of 11 Latvian teachers, 7 Indian psychologists, and 4 teachers from Latvia, the discussion yielded intriguing insights.

In India, cultural practices intertwined with nature encompass activities such as tree planting, morning walks, and rituals involving plant care, which underscore both the connection to nature and the associated health benefits. Conversely, Latvian traditions, including tree planting ceremonies and an emphasis on appreciating nature's beauty through activities like hiking, exemplify a deep-seated cultural bond with the environment.

Regarding strategies for promoting nature connectedness, participants proposed various approaches. These suggestions encompass integrating nature-based practices into educational curricula, organizing collaborative events such as tree planting and clean-up drives, utilizing emotional intelligence training programs, and implementing media campaigns highlighting the positive impact of sustainable practices on the environment.

Moreover, the role of educators and parents emerged as pivotal in nurturing nature connectedness among young adults. Educators were encouraged to enhance engagement by incorporating

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nature-based learning experiences into their teaching methodologies. Meanwhile, parents were deemed influential in shaping their children's perspectives by fostering outdoor activities and actively participating in environmental awareness programs conducted in schools.

Thus, the group interview shed light on the multifaceted dynamics of nature connectedness and underscored the importance of cultural values, educational strategies, and parental involvement in fostering a deeper connection with the natural world among young adults in India and Latvia.

4. Conclusions

In the culmination of this exploration into the intricate dynamics of nature connectedness, materialism, and emotional intelligence among young adults in India and Latvia, several compelling conclusions and avenues for future research emerge. This study, encompassing cultural values, traditions, and the crucial role of emotional intelligence, underscores the significance of fostering a profound connection between individuals and the natural world, particularly within the context of evolving global environmental concerns.

The rich tapestry of cultural values and traditions in both India and Latvia illuminates diverse yet interconnected ways in which individuals express their affinity for nature. Practices such as tree planting, morning walks, and rituals involving plant care in India, coupled with Latvian traditions emphasizing nature's beauty through activities like hiking, not only deepen the cultural bond with the environment but also serve as potential conduits for nurturing nature connectedness.

The study unraveled noteworthy insights, highlighting a positive correlation between emotional intelligence and nature connectedness. This significant relationship emphasizes the role of emotional acumen in fostering an individual's connection with the natural world. Intriguingly, the study did not discern a substantial correlation between materialism and nature connectedness among Indian young adults, suggesting that cultural values might intricately mediate this relationship. Additionally, the identification of emotional intelligence as a predictor of nature connectedness opens avenues for targeted interventions and educational initiatives.

The suggested strategies for promoting nature connectedness extend beyond traditional paradigms. Integrating nature-based practices into educational curricula provides a structured framework for instilling environmental awareness from a young age. Collaborative events such as tree planting and clean-up drives not only contribute to tangible environmental improvements but also foster a sense of collective responsibility. Leveraging emotional intelligence training programs in schools adds a novel dimension, recognizing the emotional underpinnings of nature connectedness. Media campaigns and community gardens further emerge as potent tools to disseminate positive narratives and strengthen local bonds with nature.

Educators wield a significant influence on shaping attitudes and fostering a sense of responsibility toward the environment. By incorporating nature-based learning experiences and integrating environmental themes across subjects, educators can contribute substantially to enhancing nature connectedness. Parents, as influential stakeholders, play a pivotal role in cultivating values. Encouraging outdoor activities, participating in environmental awareness programs, and creating a home environment that values and respects nature collectively contribute to shaping a sustainable mindset among young adults.

The synthesis of cultural insights, research findings, and proposed strategies underscores the interdisciplinary nature of fostering nature connectedness. The intricate interplay between cultural values, emotional intelligence, and environmental awareness signifies the need for holistic approaches in environmental education and intervention strategies.

While this study provides valuable insights, avenues for further research beckon. Delving deeper into the nuanced connections between cultural values and materialism, understanding the longitudinal effects of emotional intelligence on nature connectedness, and exploring the efficacy of proposed strategies in diverse cultural contexts remain essential for thorough comprehension.

In conclusion, the study illuminates the multifaceted nature of fostering nature connectedness among young adults. Acknowledging cultural nuances, leveraging emotional intelligence, and implementing innovative strategies contribute to cultivating a generation that not only values but actively strives to preserve the natural world.

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INNOVATION IN EDUCATION FOR DEEPER LEARNING

Education and educational systems represent a powerful source of success (or failure) for any political community. The emergence of AI and new technologies will progressively transform the labour market, leading to technological unemployment. In this scenario, promoting pedagogical strategies fostering deeper learning represents an ethical and pragmatic commitment to synchronize education with the ongoing socio-economic transformations. In line with the road ahead, the scope of the volume is to collect ideas, reflections and experiences related to deeper learning and skill development in the education environment.

