![European Commission logo]

Latest research trends on the social dimension of education and training (January-June 2024)

NESET
July 2024

NESET

Education and Training

Table of contents

Introduction: relevant themes and issues on the social dimension of education and training

This document presents the most prominent topics in education research globally (with a higher representation of Europe and the US) in the first half of the year (January to June 2024) and provides a summary of important themes and issues to inspire future European Commission work in the social dimension of education and training. This summary highlights specific focus areas that are covered by recently published research articles and may be relevant to the European Commission's programme 2023/2024[1] and the Directorate General for Education, Youth, Sport, And Culture (DG EAC) Strategic Plan[2] 2020-2024, and the European Education Area[3] focus topics.

---

[1] European Commission Work Programme 2023 and 2014 Accessible at: https://commission.europa.eu/strategy-documents/commission-work-programme_en

[2] Strategic Plan 2020-2024 Directorate General for Education, Youth, Sport, And Culture Accessible at: https://ec.europa.eu/info/system/files/eac_sp_2020_2024_en.pdf

[3] More info at: https://education.ec.europa.eu/

Journal selection

In 2024, the list of journals for tracking research trends was reviewed based on established criteria, with a focus on topic coverage, geographical relevance, and quality assurance. This revision aimed to apply a more transparent and systematic method for key journals selection. The final list of consulted platforms includes academic journal articles and publications from international organisations involved in education (e.g. OECD, World Bank, etc.). This revised list was afterwards shared with members of NESET to seek recommendations and suggestions for additional relevant journals that publish articles related to the social dimensions of education. The following list indicates the sources and number of articles from each source included in the analysis.

Table 1: Journal/International Organisation list

N	Journal/Relevant organisation	Number of articles selected
1	Education Sciences	25
2	International Journal of Sustainability in Higher Education	9
3	Educational Evaluation and Policy Analysis	8
4	Computers & Education	6
5	Educational Research Review	6
6	European Journal of Education	6
7	European Journal of Special Needs Education	6
8	Education and Training	5
9	Educational Psychology Review	5
10	Higher Education	5
11	International Journal of Educational Research	5
12	OECD Library	5
13	Gender and Education	4
14	Journal of Education Policy	4
15	Journal of Teacher Education for Sustainability	4
16	Research in Higher Education	4
17	Review of Educational Research	4
18	European Early Childhood Education Research Journal	3
19	Journal of Women and Minorities in Science and Engineering	3
20	Teaching in Higher Education	3
21	World bank	3
22	European Educational Research Journal	3
23	Early Child Development and Care	2
24	European Journal of Teacher Education	2
25	Publications Office of the European Union	2
26	Comparative Education	2
27	International Journal of Lifelong Education	1
28	Journal of Curriculum Studies	1
29	Learning and Instruction	1
30	Assessment & Evaluation in Higher Education	0
31	GEM report	0
32	Journal of Environmental Education	0
33	Professional Development in Education	0
34	Teaching in focus (OECD)	0
35	UNESCO publications	0
36	Eurydice	0
	Total	**137**

Optimising article clustering with NLP tools

In our ongoing efforts to enhance the efficiency and objectivity of our research trend-tracking process, we have integrated Natural Language Processing (NLP) tools into our workflow. These tools automate the extraction of relevant themes and keywords from academic publications.

The implementation of these tools has significantly reduced the need for manual review and selection of topics, thereby ensuring a broader and more unbiased approach to identifying emerging research topics. Furthermore, their use has facilitated the recognition of other trends in article characteristics, such as the prioritisation of specific education levels over others.

By employing advanced NLP techniques such as keyword extraction and thematic clustering, our aim is to systematically identify and summarise developments and trends in the field of education and training.

Rationale for using natural language processing

The transition to NLP-based research trends is driven by the need to manage efficiently the vast volume of data generated daily[4]. Traditional methods are time-consuming and prone to human bias, limiting their effectiveness in comprehensive policy analysis[5]. NLP techniques offer systematic processing, enhancing the objectivity and efficiency of data analysis[6]. This shift allows for more accurate insights and better-informed policies, which, in the long term, can feed into foresight analysis to anticipate future scenarios. By leveraging ML and NLP, we aim to improve the quality and relevance of our research trends, ensuring they effectively support the policy development process.

Process

The transition to NLP-based research trends involves a structured framework to ensure comprehensive data analysis and clustering. Our approach follows a two-step methodology: keyword extraction (NLP-based) followed by clustering (ML technique).

- First, keyword extraction is performed using NLP techniques to identify relevant terms from titles and abstracts. This step is crucial as it lays the foundation for subsequent analysis by capturing the essence of the text.
- Next, these keywords are embedded into a vector space and undergo dimensionality reduction to streamline the data. A clustering algorithm (here, HDBSCAN[7]) is then applied to group the keywords into meaningful thematic clusters. This phase helps uncover underlying patterns and trends within the dataset.

This process ensures a systematic and objective analysis of large volumes of text, enhancing the efficiency and accuracy of our research trends.

---

[4] 396 publications were released in May 2024 on the European Publication website alone.
[5] Nay, J. (2018). Natural Language Processing and Machine Learning for Law and Policy Texts. SSRN Electronic Journal. https://doi.org/10.2139/ssrn.3438276
[6] It is important to note that while NLP techniques can significantly reduce human bias in data processing, they are not free from bias themselves. The algorithms can inadvertently perpetuate existing biases present in the training data. Therefore, integrating a 'human-in-the-loop' approach is crucial to provide oversight and contextual interpretation, helping to mitigate these biases and ensure the quality and relevance of the outputs.
[7] 'HDBSCAN', Scikit-Learn, 2024. https://scikit-learn.org/stable/modules/generated/sklearn.cluster.HDBSCAN.html.

Initial results

This process successfully identified 16 distinct clusters, each representing a unique thematic area within the dataset. The model revealed the following keywords, as visualised in the accompanying word cloud:

Source: Own creation.

After the initial clustering, the coordination team conducted further analysis, using expert knowledge to connect and refine some of the cluster groups. This process led to the identification of the broad topics described in the following section of the report.

Overall, the initial implementation of ML and NLP techniques demonstrates significant potential in enhancing the objectivity and efficiency of our data processing. NLP is employed as a powerful tool to detect patterns that are difficult to discern through traditional methods and to understand the large database in novel ways, but it is not meant to replace human expertise which further refines the NLP clustering.

Results

From the analysis of the most prominent journals focusing on the social dimension of education and training and some key recent studies, **five broad themes relevant to the priorities of the European Commission and the broader context of the social dimension of education and training** could be observed. These topics include:

1. Promoting equity and inclusion in education

2. Sustainability in education: focus on teaching practices and Higher Education

3. Innovative practices in education: innovative teaching practices and the use of AI

4. Enhancing well-being in education

5. Strategies to address challenges in literacy, reading and language instruction

General trends reveal a predominance of studies focusing on Higher Education, followed by School Education. Early Childhood Education (ECEC), Vocational training (VET) and Lifelong Learning are also being studied to a lesser extent. The focus on Higher Education is an emergent trend for this period and is not related to our selection of specific journals for this level, but to the increased orientation of recent studies on this education level.

In methodological terms, current research employs a range of techniques within both qualitative (e.g. case studies, discourse analysis, ethnographic analysis, etc.) and quantitative approaches (e.g. experimental trials, statistical analysis, large-scale surveys), with fewer cases employing mixed methods.

The next section of the report is structured according to the broad themes listed above. The selected scientific articles and key publications are then discussed to give a broader understanding of each theme.

1. Promoting equity and inclusion in education

Inclusion in education refers to a global shared principle aimed at ensuring and promoting equity for all by removing barriers to learning and participation (Honkasilta and Koutsoklenis, 2024). Research in these fields seeks to identify how these barriers operate, and the challenges faced by underrepresented groups and individuals within the education system.

As a broad concept, 'Equity and Inclusion', encompasses multiple research lines. When addressing under-represented groups, studies often focus on **students facing inequalities based on race, ethnicity, gender, disabilities or vulnerable conditions related to their migrant backgrounds (e.g. refugees, asylum seekers, etc.).** These conditions often intersect with socio-economic vulnerabilities, intensifying the challenges these students face. Therefore, an equity and inclusion-focused approach to education must consider all these groups and their unique experiences. These vulnerabilities often result in higher school dropout rates, poor learning outcomes, negative impacts on wellbeing and quality of life, and significant psychological costs (Briceno-Mosquera 2023).

At the policy level, studies on inclusion usually describe the **role of inclusive policies to tackle these inequalities.** They highlight the importance of facilitating access and guarantee retention of minority groups (Amer et al. 2024), helping them develop a sense of belonging (Chrobak 2024) that considers **cultural elements, institutional, social, and pedagogical practices** (Honkasilta and Koutsoklenis 2024). In addition, they indicate that the successful implementation of inclusive practices is strongly determined by teachers attitudes (Khamzina et al. 2024) and by societal support for its most marginalised groups (Hartonen et al. 2024).

Among inclusion topics, a large proportion of articles address the **unique characteristics and challenges faced by students with disabilities.** These students may either be integrated into the mainstream education system or attend special education institutions. At the policy level, research explores the impact of the definitions and theoretical frameworks of disabilities on policy development. Cruz et al. (2023) argues that most policies still view student differences from a deficit perspective, and that recommendations based on this view are unlikely to improve the experiences and outcomes of students with disabilities.

When focusing on the factors affecting students with disabilities in education, parents' perspectives are especially valuable. According to Sirem (2024), parents report that inclusive education positively impacts their children academically, socially, behaviourally, and psychologically during primary school. Homerin and Dodds (2024) examine the barriers that families experience during the transition from early intervention to preschool and discuss how parent's deal with the challenges and benefit from all available support. Other factors identified in the literature refer to the relevance environmental and peer factors and their effect on autistic students' motivation (Lebenhagen and Dynia 2024; Martín-Cudero et al. 2024).

Teacher attitudes towards inclusion and collaboration are highlighted as crucial. In Norway, Mudhar, Ertesvåg, and Pakarinen (2024) found that high self-efficacy among secondary education teachers is associated with supportive environments and collaboration on inclusion. In Slovenia, successful initiatives like visual arts classes for students with severe learning difficulties indicate the importance of teacher's collaboration (Rihter, Babuder, and Zuljan 2024). Macagno et al. (2024) concluded that **a child-centered approach, an inclusive teaching environment, and a family-friendly atmosphere are vital for early childhood education**. Lastly, Lacruz-Pérez et al. (2024) identified that teachers' implicit and explicit attitudes towards inclusion significantly affect the inclusion of students with ASD.

In the area of Physical Education (PE), training courses for teachers with focus on students with disabilities remains insufficient (Celestino et al. 2023; Tanure Alves and Carvalheiro Campos 2024). In Portugal, research indicates that PE teachers lack essential skills to teach students with Specific Health Needs (SHNs). Additionally, Tanure Alves & Carvalheiro Campos, (2024) highlighted that traditional practices and beliefs in school PE negatively affect students with disabilities and consider that the implementation of Paralympic sports in the PE curriculum is crucial for promoting inclusive education and recognizing disability identity.

There has been increasing attention to inclusion in Higher Education from an equity perspective, especially on the role of teachers' and their perceptions on inclusion of students with disabilities. Studies by Altes et al. (2024) and Morgado and Sánchez-Díaz, (2024) explore teachers' understanding of inclusion and which are the frameworks they employ when teaching, such as the social model of disability or the inclusive education approaches. Korthals Altes et al. (2024) describe significant gaps in knowledge, skills, experience, and confidence among teachers in the Netherlands, as well as institutional limitations like inadequate resources and support. In addition, students assessment play a crucial role, often serving as a primary barrier to effective inclusion in this level (Nieminen, Moriña, and Biagiotti 2024). The authors discuss **the ethics and equity at play in how assessment shapes inclusion of students with disabilities** and suggest new models for assessment based on the principles of Universal Design for Assessment[8].

---

[8] These principles, according to Johnstone et al., (2022), considers that students' access needs could be determined before an assessment situation (not after), and these needs could then be considered while designing assessment accessible (Nieminen, Moriña, and Biagiotti 2024).

Moriña, Tontini, and Perera (2024) delve into the factors that have influenced the university success of graduates with invisible disabilities and propose recommendations for students to successfully complete their degrees in Italian universities. **Family, peers, and specialised faculty offices were found crucial to students' success.** Similarly, the delivery of information about university support services for students should be enhanced, and faculty staff should be better informed about students' disabilities in their classrooms (Moriña, Tontini, and Perera 2024).

The impact of ICT in the experience of students with disabilities Higher Education is increasingly relevant. Fernández-Cerero, Cabero-Almenara, and Montenegro-Rueda (2024) emphasize the importance of designing and implementing inclusive technologies. However, other studies in Greece from Bachtsis, Perifanou, and Economides (2024) point out the **lack of infrastructure and digital skills training programmes for teachers to address particular needs of students with disabilities.** Similarly, Rodríguez-Jiménez et al. (2024) found that online teaching negatively impacts the quality of life and emotional well-being of students with Autism Spectrum Disorder (ASD).

To move towards a more inclusive education system, research extends beyond challenges of students with disabilities to investigate the **causes and consequences of discrimination towards under-represented groups**. These studies explore both traditional and emerging forms of discrimination, highlighting their harmful impact on education and social cohesion.

Regarding racial discrimination, particularly in the US and to a significant extent in European countries, studies discuss how **racial discrimination is rooted in public policy discourses in education** (Vue et al. 2024). McCambly and Mulroy (2024) examine the political origins that inscribe racial inequity into administrative and organizational action in education institutions. Thus, even in the absence of explicit reference to racial constructs, racialised policy frameworks persist. Jaquette and Salazar (2024), Zabala-Eisshofer, Somerville, and Wiley (2024) and Epstein et al. (2024) provide examples of how these **structural racism is embedded in Higher Education administration offices,** for example, through selection devices for student support allocation and the inadequate legal responses to hate speech within educational institutions. Vierra et al. 's (2024) results on the need for institutions to consider racial barriers when mentoring students from marginalised backgrounds to increase their opportunities to access STEM careers is another clear evidence of the need to implement better and more effective policies on this matter.

The literature also describes **the emergence of new forms of racial and gender discrimination and violence, such as digital-based violence, and its direct link to education.** (Beard, Shortt, and Xie 2024). Multiple studies (Freude, Bonet, and Calvet 2024; Setty, Ringrose, and Hunt 2024; Ging et al. 2024) raise attention to how most digital violence is directly addressed towards women and the LGBTIQ+ community, and recommend promoting training programs and workshops for students on DGBV (Digital Gender-Based Violence), especially in Higher Education (Freude, Bonet, and Calvet 2024, Christou et al. 2024). Ging et al. (2024) links the increase of gender-based violence and sexual abuse to the rise of misogynistic influencers online and describe how they have become a concerning issue in UK and Irish schools. This study **recommends the adoption of intersectional and whole-school approaches to education on sexual violence to address these issues and help students question gendered privileges** (Ging et al. 2024). Setty, Ringrose, and Hunt (2024) argue that combating Sexual and Gender-Based Violence (SGBV) requires transformative solutions that involves active youth participation and explore the concept of 'post-digital sexual citizenship' as a potential theoretical category. Anitha, Jordan, and Chanamuto (2024) also work at the conceptualisation of gender-based violence and its link to institutional policy and regulatory frameworks in the UK.

In addition to addressing visible forms of gender and sexual violence, current literature also examines the **persistent, less visible barriers that hinder the achievement of gender equity**. Studies explore how gender inequality manifests across various education levels and age groups, uncovering the complexity of gender-related norms and stereotypes (Yigit-Gencten et al. 2024; Binderkrantz and Bisgaard 2024). Established from early education and reinforced during basic and Higher Education, such norms often influence students' choices when entering the labour market (Jaoul-Grammare 2024). To address these issues at the policy level, a publication by World Bank emphasised that getting girls into school was insufficient, and **recommends promoting programmes that enhance girls' enrolment outcomes through scholarships, cash transfers and stipends** (Bentaouet Kattan, Khan, and Merchant 2023).

Research on gender continues addressing the underrepresentation of women in STEM careers (Bystydzienski and Eisenhart 2024; Feierabend et al. 2024; Kealy, McCauley, and Flynn 2024; Jaoul-Grammare 2024; Smith 2024; Shekhar et al. 2024; Calvo-Iglesias and Epifanio 2024; Guo et al. 2024; NESET 2024). Feierabend et al. 2024 study the obstacles that girls experience from early life and ask about the role of ECEC educators in cultivating positive attitudes, self-concepts and STEM skills on girls, and its potential influence on future professional choices in the future. A three-months programme proves positive results in enhancing educators' self-concepts and reducing gender stereotypes. In addition, Kealy, McCauley, and Flynn (2024) highlight that supporting male access to female-dominated science fields (e.g. biology) can add to the effort of supporting female access into male dominated sciences (e.g. physics). Jaoul-Grammare (2024) also addresses this by studying the influence of stereotypes on career plans in France and discusses the gendered representations of occupations as well as the social representations of prestige associated with a profession. Calvo-Iglesias and Epifanio (2024) discuss the decisive role of alternative masculine roles in the academic world and how they can help break down stereotypes on gender inequality in STEM careers.

The interaction between gender and other factors is also explored in literature. Bourabain (2024) studies the gendered-racialised interactional and contextual dynamics hindering the socialisation of ethnic minoritised women (EMW) within the Belgian Higher Education system. This study informs Higher Education institutions about the risk of increasing women dropout rates if no support is provided. López (2024) also delves into the intersection of race and gender and investigates the determinants of wages among black males in STEM and non-STEM occupations compared to their white male peers.

As another under-represented group, a set of studies particularly focus on the challenges experienced by students with migrant background. Hartonen et al. (2024) studies how the **marginalisation of asylum seekers creates limitations for engagement and participation of students in educational pre-integration programmes** in a reception centre context in Finland. The authors studied an asylum centre in the context of the KOTO project. Vieluf and Sauerwein (2024) also study this vulnerable group and indicate that students with migration backgrounds usually experience less recognition from teachers, and report that these differences can help explain the inequalities in reading achievement. Matei and Ghența (2024) focus on Romanian transnational families and how their persistent unequal conditions directly impact their quality of life. Lastly, Álvarez-Sotomayor and Gutiérrez-Rubio (2024) describe how academic achievement in Spain is ethnically stratified. The authors found that students from non-European developing countries and two European groups with a lower socioeconomic profile (Romanian and Portuguese) have the largest gap compared to native students. Most factors explaining these differences are related to social origin and language barriers.

Finally, the research community examines **how these vulnerable conditions interact with and are often exacerbated by socio-economic disadvantages**. The literature addresses these issues when discussing the effect of socio-economic segregation in the school system (Dalane and Marcotte 2024; Tapia 2023), the effect of income inequality on

student achievement (King, Cai, and Elliot 2024) or how economic inequality conditions decision processes in education that usually lead to a reinforced reproduction of inequality (Christoph, Spangenberg, and Quast 2024). In the latter, the authors highlight the role of parents and **how the social background effect play a relevant role in perpetuating inequalities when students decide to pursue vocational training or Higher Education studies**.

To address this problem, many countries have started implementing policies to **identify students with disadvantaged backgrounds** or students with higher risk of dropping out (Canbolat 2024; Fazlul, Koedel, and Parsons 2024). Fazlul, Koedel, and Parsons (2024) presented the development of a new quantity measure of student risk called Predicted Academic Performance (PAP). This tool identifies students at risk of poor academic outcomes. These proposals from the academic community can help policy target resources towards risk categories.

Overall, research trends indicate the broadness of the concepts of inclusion and equity and underscore the importance of addressing the challenges faced by under-represented groups. They also evidence the need to develop specific policies tailored to the type of challenge faced by each student, the education level they attend and the specific field of studies (e.g. Physical education, Language studies). Moreover, it is crucial not only to focus on students who require more support, but also to encourage teacher training and to adopt comprehensive, intersectional and whole-institution approaches for inclusion. These approaches should aim to foster awareness among students and the wider educational community, making persistent barriers more visible, tackling discrimination, and embracing diversity.

2. Sustainability in education: focus on teaching practices across education levels, with special attention to Higher Education

The NLP model grouped a collection of articles around the concept of 'sustainability', and most studies focused on teacher practices on different education levels but especially for Higher Education. This highlights the importance the research community places on these topics and demonstrates how the sustainability agenda is integrated into research both globally and within the European context.

Focusing on sustainable initiatives and practices, Sihvonen et al. (2024) studied an environmental recycling project in a Finnish kindergarten to explore the main drivers of sustainable lifestyles in the families of kindergarten children. The results prove that **parents' strong environmental sensitivity significantly influences their willingness to engage with the community**, highlighting the importance of collaboration with educators in promoting environmental awareness from an early age. Okeke, Mudzielwana, and Mokhele-Makgalwa (2023) emphasise that transforming communities largely depends on the sustainable provision of ECEC by a highly trained workforce.

A large set of studies focus on the link between teaching practices, climate change, and sustainability. Kitagawa (2024) found that according to teachers, geography classes in secondary-level education in both England and Japan do not adequately cover climate change, sustainability, and disaster risk reduction. **There is also a lack of implementation of environmental and sustainability education in schools and an insufficient focus on disaster risk reduction in teacher training provision.** Forbes, Lord, and Díaz-Montiel (2024) studied a course designed to promote geographic and cultural diversity to enhance student learning about water sustainability and suggest the importance of the pedagogical framework to advance on sustainable issues.

In Higher Education, research on Spanish universities reveals **limited understanding of how teachers perceive or represent sustainability.** Yarritu et al. (2024) explains that

the representation of sustainability varies based on the teaching field, teachers' prior knowledge of the 2030 Agenda, and the teacher's gender. In line with these results, Lafuente-Lechuga, Cifuentes-Faura, and Faura-Martínez (2024) examine the role of mathematics instruction in introducing Sustainable Development Goals (SDGs) in university classrooms, and concludes that **effective sustainable strategies require significant changes in curricula, assessment methods, competencies, and teacher training schemes**. Lastly, authors found that the university plans and initiatives focusing on sustainability and the 2030 Agenda are very limited, especially in privately managed Higher Education institutions (Diaz-Sarachaga and Longo Sarachaga 2024).

When examining how sustainability is reported and assessed at the university level, a study in Spain reveals that the main educational indicators used to monitor sustainability primarily focus on community, services, and transfer; curriculum and teaching; operations; and research (Rosa, Boscarioli, and Freitas Zara 2024). In Portugal, Monteiro, Ribeiro, and Molho (2024) highlight that the lack of well-defined reporting structures makes it challenging to map and evaluate Higher Education institutions' (HEIs) performance in relation to the 2030 Agenda. However, some tools, such as the Environmental Portrait Value Questionnaire used in Spain, are recognized as effective for assessing young adults' commitment to sustainability and environmental protection goals in universities (Margaça et al. 2024).

A more in-depth analysis reveals that **research articles use the concept of sustainability with various approaches.** For instance, most researchers use sustainability to refer to the impact of climate change on education and how educational institutions should address the challenges posed by the climate change crisis (World Bank, 2024). However, some authors use 'sustainable development' to refer, for example, to sustainable evaluation models that emphasize student independent learning and meta-cognitive skills or consider teachers' beliefs as a form of sustainable evaluation (Briede and Drelinga 2023). A study examining the influence of English proficiency on the development of Sustainable Development Competencies (SDCs) for future primary school teachers in Ukraine also revealed a different understanding of the concept of sustainability. The authors found a positive correlation between English proficiency and the development of SDCs, describing sustainable competencies as collaboration, strategic thinking, critical thinking, modelling sustainable behaviour, systems thinking, and future thinking (Chaikovska et al. 2024).

At the policy-level analysis, Kushnir et al. (2024) examined the European Higher Education Area (EHEA) in its international policy agenda for sustainability since 2020 and its connection to the UN's approach to Sustainable Development (SD). Thematic analysis of policy documents and interviews with key stakeholders in France, Germany and Italy revealed that the EHEA has the capacity to mitigate difficulties found in the UN's SD agenda approach. However, according to the authors, the EHEA still lacks a concrete implementation strategy for sustainability policy development, leaving some definitions of SD somewhat ambiguous throughout international policy documents. At the policy level, the OECD Higher Education policy team also publishes key lessons and inspiring examples of policy and practice to inform collaboration between secondary education and Higher Education. This Education Spotlight document is shared to advance on understandings of which are the competencies that can trigger and shape innovation for the digital and green transitions (OCDE 2023).

The research topics reveal a growing interest in sustainability. However, numerous challenges remain in implementing more sustainable practices within educational institutions and at the policy level. Both top-down policy initiatives and bottom-up classroom practices are essential to promoting sustainable practices effectively, and the use of research evidence for policy design could drive progress (Malkin 2024).

3. Innovative practices in education: innovative teaching practices and the use of AI

Interestingly, the NLP model created a cluster linking innovative educational practices articles with papers related to student motivation and satisfaction, implying that there is a strong connection between those bodies of research. This is confirmed by articles such as those analysing learning analytics (Tzimas and Demetriadis 2024) or flipped learning (Galindo-Melero et al. 2024) which include student satisfaction in their analytics. This link between student engagement and innovation is strongly shown in the article titled 'Impact of Gamification on Students Learning Outcomes and Academic Performance: A Longitudinal Study Comparing Online, Traditional, and Gamified Learning' by Lampropoulos and Sidiropoulos (2024). They conducted a longitudinal study to compare online, traditional, and gamified learning environments. Their research found that gamified learning significantly improved student outcomes in terms of grades, engagement, and retention rates. The study highlighted that **gamification increased both intrinsic and extrinsic motivation, making the learning process more enjoyable and fulfilling students' basic needs for autonomy, competence, and relatedness**. This suggests that integrating digital tools and gamified elements can effectively enhance student satisfaction and academic performance, further supporting the strong link between innovative educational practices and student motivation.

Another topic largely debated in the scientific community is learning analytics (LA), which "involves collecting, processing, and visualising big data to help teachers optimise learning conditions" (Tzimas and Demetriadis 2024). Its role of extracting student behaviour patterns and creating predictive models is being used in diverse educational settings, but the articles analysed here focus mainly on Higher Education. Sharif and Atif (2024) offer a systematic literature review which examines the impact of LA on Higher Education. They found that LA significantly enhances personalised feedback mechanisms, shifting from generic to individualised, data-driven feedback that improves student engagement and learning outcomes, as well as offers better early detection of struggling students. However, the study identifies critical challenges such as data privacy, the need for high-quality data, and the importance of technical expertise and faculty buy-in. Tzimas and Demetriadis (2024) analyse whether strong and minimal guidance provided by LA in Higher Education settings has the same impact on student outcomes, specifically on self-regulated learning (SRL) skills, performance, and satisfaction. Their work showcased that strong guidance significantly improved final grades, student satisfaction and SRL skills compared to minimal guidance. In addition, a study by Fu et al. (2024) at Taipei Tech shows how analytics can enhance education in novel ways. Using LA tools to analyse 342 000 course records, the study found that higher multidisciplinarity correlates with better academic performance in STEM fields. The research highlights the potential of learning analytics in optimising curriculum design to foster multidisciplinary learning and improve student outcomes.

Several research articles worked on the role of digital tools in education, such as Twitter or Virtual Reality (VR). An article by Déchène et al. (2024) explores the role of Twitter in science communication and its utilisation by teachers for professional development, focusing on the German #twitterlehrerzimmer (TWLZ) community. Using a mixed methods approach, the study found that teachers are highly active on Twitter, using it primarily for digital professional development and resource sharing. Despite encountering fewer research-based tweets, teachers frequently implement these findings in their teaching. The study highlights the preference for interactive and practical tweets, emphasising linked content and neutral technical language. These findings suggest that **for effective science communication, researchers and educational institutions should prioritise interactive, practical content and engage directly with teachers**. Spangenberger, Freytag, and Geiger's (2024) recent article investigates the impact of multisensory stimuli in immersive VR on nature connectedness and pro-environmental behaviour. The researchers explored how embodying a tree in an immersive VR setting, particularly with

multisensory enhancements, affects individuals' connection to nature and their willingness to engage in pro-environmental actions. Their study suggests that immersive VR experiences can effectively promote environmental awareness and action by allowing users to take the perspective of non-sentient beings, thereby fostering a deeper reflection on the human-nature relationship. This showcases how digital tools can effectively promote the green transition.

Continuing on the use of digital tools in education, some of them are used specifically for teacher training programmes. Indeed, **VR is proving to be a transformative tool in teacher training, offering immersive and interactive environments that enhance learning and skill development**. Budin's study (2024) on mixed reality simulations highlights the versatility of VR in preparing and recruiting future teachers, demonstrating successful outcomes in behaviour observation, communication skills, and engagement with high school students through the TeachLivE™ platform. Similarly, Docter et al. (2024) designed a VR application integrated with artificial intelligence to develop classroom management competences. This application allows teachers in training to interact with virtual students in a realistic setting, providing rich verbal interactions and paving the way for future improvements in non-verbal communication training. Daltoè et al. (2024) research on 360-degree videos further emphasises the benefits of VR, showing that preservice teachers (PSTs) experience higher cognitive, affective, and physiological involvement, leading to more accurate teaching-quality ratings compared to traditional video environments.

With AI and digitalisation becoming increasingly integrated into daily life, researchers are focusing on their lasting impact on several aspects of society. Both Lindqvist et al.'s (2024) study on lifelong learning in the digital era and Essa's (2024) exploration of the future of postsecondary education in the age of AI highlight the **transformative potential of technology in education**. Lindqvist et al. (2024) emphasise the role of digitalisation in creating new conditions for lifelong learning, enhancing accessibility, and necessitating educational reforms that cater to both formal and informal learning contexts. Similarly, Essa (2024) argues that AI, as a general-purpose technology, will fundamentally redefine educational practices by offering personalised and flexible learning solutions, particularly benefiting adult learners and addressing the dynamic demands of the modern workforce. Both articles underscore the need for innovative approaches in education to bridge the gap between current practices and the evolving needs of learners, advocating for a shift towards more adaptive and inclusive educational systems. Finally, Gulson and Sellar (2024) worked on the **possibility of AI to create new norms in education policy and governance.**

Regarding innovative classroom practices, the research community has shown some interest in flipped learning (FL), which involves delivering direct instruction through videos and using class time for practical, collaborative activities (Galindo-Melero et al. 2024). FL is thought to support deeper understanding and the development of critical thinking and problem-solving skills. It shifts the role of teachers to moderators and emphasises student-centred learning. The results of the 8-year experiment with engineering graduates show significant improvement in both the quantity and quality of academic results. Some of the recommendations highlighted by the researchers were linked to promoting active student participation through FL and the use of weekly activities, use activities that adapt to learners' needs which should be continuously monitored.

Further research by Köpeczi-Bócz (2024) examined the effects of combining project-based learning (PBL) with the flipped classroom (FC) model on university students' motivation and learning outcomes. This study, involving bachelor, master, and higher vocational education and training students, found significant improvements in learning motivation and achievement, especially at the BSc and HVET levels. Interestingly, and to connect with the first part of this section, the integration of digital tools and online platforms played a crucial role in delivering pre-learning materials and facilitating interactive class activities. This

blend of digitalisation with innovative teaching methods enhances educational practices, better-preparing students for the evolving demands of the labour market.

4. Enhancing well-being in education

An increasingly relevant topic that has emerged from the cluster analysis addresses well-being in education, proposing various analytical questions on how to guarantee well-being of students and other education community actors, such as teachers and parents.

Approaches to study well-being vary across the research community. **Some use students' wellbeing as an explanatory variable to study other education phenomena, such as student dropout and promotion rates.** For instance, Zając et al. (2024) found that student receiving mental health treatment are more likely to drop out. Other studies try to explain which are the factors that affect students' wellbeing. Kassis et al. (2023) analyses student resilience predictors during COVID-19 in Greece, Germany, and Switzerland identifying that individual factors like self-esteem and self-efficacy are influenced by social factors, such as the role of teacher, parental support, and the access to social resources. Dempsey et al. (2023) focused on how parental experiences during school transitions impact student well-being, recognising differential effects based on parent's gender. The author's conclusions emphasise the need for increasing policy attention to students' family context. Bachman, Cunningham, and Boone (2024) highlight the importance of family engagement in student mental health, **recommending educators to promote supportive home environments, collaborative problem-solving and self-regulation.**

In this context, the publication of the 'Guidelines for school leaders, teachers and educators to address wellbeing and mental health at schools' developed by the Commission Expert Group on supportive learning environments for groups at risk of underachievement and for supporting wellbeing at school is a significant contribution. At the policy level, it helps advancing into more resilient systems that consider the needs of teachers and principals.

Methodological considerations in studying student well-being are also critical. Rappleye et al. (2024) and Kim (2024) critically analyse the approach of the OECD measurement of student well-being in PISA. Rappleye et al. (2024) raise concerns about the need for context-based methodologies that consider cultural differences. Kim (2024) discusses the conceptual clarity of foresight methodologies, and the use of 'techno-scientific scripts' as a strategy to promote well-being as solutions to anticipated crises.

In Higher Education, research also examines the role of tutors and teachers in student mental well-being. White et al. (2024) asks about Postgraduate research students, noting their high levels of psychological distress and call for more equitable access to mental health support services. In Germany, Baalmann (2024) concludes that health-related quality of life influences student self-perception of success, and their likelihood of dropping out. In line with these results, Douwes et al. (2024) analyse the teacher's perceptions in Higher Education institutions in the Netherlands and concludes that **universities should increase the support to teachers in helping them recognising and maintaining boundaries in their role as supporters and their teaching responsibilities**. Lastly, a study on Ukrainian teachers delves into how university professors handle the hardships of teaching in wartime, and how they cope with the dual challenges of supporting students and redefining their academic identities in war times (Oleksiyenko and Terepyshchyi 2024).

In this context, NESET analytical report on "Student and Staff Mental Well-being in European Higher Education Institutions" is a valuable contribution to the academic community debate. This report highlights the **increasing concern in academic research and policy debates and examines institutional and national levels approaches to supporting the mental health and well-being of university communities.**

Additionally, it provides recommendations to address these issues from a holistic approach (NESET, 2024).

Another set of **research articles link student wellbeing in with soft skills development**. Saman and Wirawan (2024) delve into the effect of psychological wellbeing on soft skills. Interesting findings of students' grade level mediation on the relation between psychological well-being and soft skills are discussed. Another study focused on the effect of teamwork skills on student psychological balance and self-esteem. The regression model identifies decision-making, leadership, and communication as key predictors of self-esteem, with gender and age differences noted (De Prada, Mareque, and Pino-Juste 2024).

Lastly, the research community focus topics relate to students' well-being and access to job market opportunities. Quigley et al. (2023) found that lack of experience with employer selection tests affects student confidence and self-esteem. Dodd et al. (2024) identified mental well-being and financial independence as key concerns impacting students' quality of life, **calling for deeper analysis of the unequal access to job opportunities and its effects on student well-being**.

An analysis of the current literature highlights the relevance of well-being at the different levels of education and at the policy and institutional levels. Research on well-being usually refers to the unresolved mental and well-being issues that arise during COVID-19. It is important to develop research on these issues to support educational institutions in the short and long term.

5.   Strategies to address challenges in literacy, reading and language instruction

The final topic focuses on challenges related to literacy, reading, and language instruction. Various studies propose solutions and initiatives to enhance literacy and reading practices among students. Additionally, a subset of articles delves into the specific context of multilingual education.

Merke, Ganushchak, and Van Steensel (2024) explore the need to improve students' reading capacities, proposing the Independent Silent Reading (ISR) methodology in schools. They found a small but significant positive short-term intervention effect of ISR on reading proficiency, particularly effective for students at risk of reading failure. Santos, Santiago, and Cruz (2024) examine how problem posing and solving in contexts familiar to students can influence the development of literacy capacities, encouraging effective learning, mathematical reasoning, and communication.

Several studies discuss **the inclusion of technological initiatives to promote reading practices** and highlight their pedagogical implications. For example, Altamura, Vargas, and Salmerón (2023) study new forms of digital reading and analyse the relationship between leisure digital reading habits and reading comprehension. Alrawashdeh et al. (2024) indicates that technology can tailor learning experiences to fit students' strengths and needs, for example, through personalised and adaptive learning methodologies, which proved effective in some contexts. However, the study results are inconclusive in terms of impact on the overall student reading achievement. Diaz-Sarachaga and Longo Sarachaga (2024) propose that well-designed digital books can outperform paper-based reading. They claim that policy initiatives should proactively support schools and teachers in establishing student-centered technology integration practices. However, they also raise concerns about how PISA results yield contradictory results on the use of technologies for reading skills development, attributed to differences in culture, context, and teacher training. Işıkoğlu and Güzen (2024) study the impact of digital storytelling activities on children's language skills, specifically focusing on expressive, receptive, and narrative abilities, as well as the utilization of technological elements in their stories. They studied a group of

children over six weeks that participated in a digital storytelling activity twice a week. The findings revealed significant improvements in the participants receptive, expressive, and narrative skill scores following the six-week digital storytelling intervention.

In multilingual contexts, Vonkova, Papajoanu, and Moore (2024) discuss the relationship between socio-economic status and motivation for learning English in the Czech Republic, confirming the **relevance of the economic variables in creating a knowledge gap based on students' opportunities to learn English.** Aleksić, Bebić-Crestany, and Kirsch (2024) found that in the multilingual ECEC context in Luxembourg, parent involvement in literacy activities and teachers' professional attitudes toward parents in multilingual centres significantly impact children's development, especially for young migrants. Elahi Shirvan et al. (2024) explain that that second language learners' beliefs about the nature of language learning are key to their success. They study the association between language mindsets and learning outcomes, and how this effectiveness might vary due to age, proficiency level, or learning context.

These studies collectively highlight the importance of adopting varied and context-sensitive approaches to enhance literacy, reading, and language skills in diverse educational settings.

References

Aleksić, G., D. Bebić-Crestany, and C. Kirsch, 'Factors Influencing Communication between Parents and Early Childhood Educators in Multilingual Luxembourg', *International Journal of Educational Research*, Vol. 124, 2024, p. 102309.

Alrawashdeh, G.S., S. Fyffe, R.F.L. Azevedo, and N.M. Castillo, 'Exploring the Impact of Personalized and Adaptive Learning Technologies on Reading Literacy: A Global Meta-Analysis', *Educational Research Review*, Vol. 42, February 2024, p. 100587.

Altamura, L., C. Vargas, and L. Salmerón, 'Do New Forms of Reading Pay Off? A Meta-Analysis on the Relationship Between Leisure Digital Reading Habits and Text Comprehension', *Review of Educational Research*, December 12, 2023, p. 00346543231216463.

Álvarez-Sotomayor, A., and D. Gutiérrez-Rubio, 'Ethnic Stratification in the Spanish Education System', *European Educational Research Journal*, Vol. 23, No. 3, May 2024, pp. 387–407.

Amer, A., G. Sidhu, M.I.R. Alvarez, J.A.L. Ramos, and S. Srinivasan, 'Equity, Diversity, and Inclusion Strategies in Engineering and Computer Science', *Education Sciences*, Vol. 14, No. 1, January 20, 2024, p. 110.

Anitha, S., A. Jordan, and N. Chanamuto, 'The Politics of Naming and Construction: University Policies on Gender-Based Violence in the UK', *Gender and Education*, Vol. 36, No. 1, January 2, 2024, pp. 86–103.

Baalmann, T., 'Health-Related Quality of Life, Success Probability and Students' Dropout Intentions: Evidence from a German Longitudinal Study', *Research in Higher Education*, Vol. 65, No. 1, February 2024, pp. 153–180.

Bachman, H.F., P.D. Cunningham, and B.J. Boone, 'Collaborating with Families for Innovative School Mental Health', *Education Sciences*, Vol. 14, No. 3, March 21, 2024, p. 336.

Bachtsis, R., M. Perifanou, and A.A. Economides, 'Challenges Faced by Students with Special Needs in Primary Education during Online Teaching', *Education Sciences*, Vol. 14, No. 3, February 22, 2024, p. 220.

Bassett, M., and L. Macnaught, 'Embedded Approaches to Academic Literacy Development: A Systematic Review of Empirical Research about Impact', *Teaching in Higher Education*, May 20, 2024, pp. 1–19.

Beard, K.S., M. Shortt, and K. Xie, 'The Emergence and Escalation of Online Racial Discrimination in Digital Spaces: A Systematic Review', *Review of Educational Research*, January 2, 2024, p. 00346543231217459.

Bentaouet Kattan, R., M.M. Khan, and M. Merchant, 'Achieving Gender Equality in Education: Examining Progress and Constraints', World Bank Group Gender Thematic Policy Notes Series: Evidence and Practice Note, 2023.

Binderkrantz, A.S., and M. Bisgaard, 'A Gender Affinity Effect: The Role of Gender in Teaching Evaluations at a Danish University', *Higher Education*, Vol. 87, No. 3, March 2024, pp. 591–610.

Blackie, M.A.L., 'ChatGPT Is a Game Changer: Detection and Eradication Is Not the Way Forward', *Teaching in Higher Education*, Vol. 29, No. 4, May 18, 2024, pp. 1109–1116.

Bourabain, D., 'Integration, Negotiation, Interrogation: Gendered-racialised Barriers to the Socialisation of Doctoral Students in Belgian Higher Education', *European Journal of Education*, Vol. 59, No. 2, June 2024, p. e12617.

Briceno-Mosquera, A., 'Learning, Compliance, and Psychological Burdens When Undocumented Immigrants Claim In-State Tuition Policy', *Research in Higher Education*, August 17, 2023.

Briede, L., and E. Drelinga, 'A More Sustainable Approach to Evaluating Teacher's Work', *Journal of Teacher Education for Sustainability*, Vol. 25, No. 2, December 1, 2023, pp. 187–200.

Budin, S., 'Three Approaches to Using Mixed Reality Simulations for Teacher Preparation and Recruitment of Future Teachers', *Education Sciences*, Vol. 14, No. 1, January 8, 2024, p. 75.

Building Competencies for Digital and Green Innovation in Higher Education, OECD Education Spotlights, Vol. 12, Vol. 12, *OECD Education Spotlights*, April 24, 2024.

Bystydzienski, J.M., and M.A. Eisenhart, 'DIVERSE, HIGH-ACHIEVING YOUNG WOMEN AND THE PURSUIT OF ENGINEERING: ACCESS, ACCUMULATION, AND ACTIVATION OF CAPITAL', *Journal of Women and Minorities in Science and Engineering*, Vol. 30, No. 3, 2024, pp. 1–28.

Calvo-Iglesias, E., and I. Epifanio, 'Revisiting Male Allies in Mathematics and Physics Throughout History: Role Models for Men in STEM Education', *Education Sciences*, Vol. 14, No. 5, May 16, 2024, p. 535.

Canbolat, Y., 'Early Warning for Whom? Regression Discontinuity Evidence From the Effect of Early Warning System on Student Absence', *Educational Evaluation and Policy Analysis*, February 5, 2024, p. 01623737231221503.

Celestino, T., E. Ribeiro, E.G. Morgado, L. Leonido, and A. Pereira, 'Physical Education Teachers' Representations of Their Training to Promote the Inclusion of Students with Disabilities', *Education Sciences*, Vol. 14, No. 1, December 31, 2023, p. 49.

Chaikovska, H., I. Levchyk, Z. Adamska, and O. Yankovych, 'Formation of Sustainable Development Competencies in Ukrainian English for Specific Purposes Students', *International Journal of Sustainability in Higher Education*, Vol. 25, No. 4, April 25, 2024, pp. 744–766.

Christoph, B., H. Spangenberg, and H. Quast, 'Tertiary Education, Changing One's Educational Decision and the Role of Parental Preferences', *Research in Higher Education*, Vol. 65, No. 2, March 2024, pp. 283–302.

Christou, M., R. Gairal-Casadó, S. Carbonell, and A. Vidu, 'Prevention of Violence against LGBTIQ+ Youth: A Systematic Review of Successful Strategies', *International Journal of Educational Research*, Vol. 124, 2024, p. 102320.

Chrobak, B., 'Narrowing (Achievement) Gaps in Higher Education with a Social-Belonging Intervention: A Systematic Review', *Educational Psychology Review*, Vol. 36, No. 1, March 2024, p. 33.

Cruz, R.A., C.M. Kramarczuk Voulgarides, A.R. Firestone, L. McDermott, and Z. Feng, 'Is Dis-Ability a Foregone Conclusion? Research and Policy Solutions to Disproportionality', *Review of Educational Research*, December 6, 2023, p. 00346543231212935.

Dalane, K., and D.E. Marcotte, 'Charter Schools and the Segregation of Students by Income', *Educational Evaluation and Policy Analysis*, Vol. 46, No. 1, March 2024, pp. 34–52.

Daltoè, T., E. Ruth-Herbein, B. Brucker, A.-K. Jaekel, U. Trautwein, B. Fauth, P. Gerjets, and R. Göllner, 'Immersive Insights: Unveiling the Impact of 360-Degree Videos on Preservice Teachers' Classroom Observation Experiences and Teaching-Quality Ratings', *Computers & Education*, Vol. 213, May 2024, p. 104976.

De Prada, E., M. Mareque, and M. Pino-Juste, 'Self-Esteem among University Students: How It Can Be Improved through Teamwork Skills', *Education Sciences*, Vol. 14, No. 1, January 19, 2024, p. 108.

Déchène, M., K. Lesperance, L. Ziernwald, and D. Holzberger, 'From Research to Retweets—Exploring the Role of Educational Twitter (X) Communities in Promoting Science Communication and Evidence-Based Teaching', *Education Sciences*, Vol. 14, No. 2, February 15, 2024, p. 196.

Dempsey, C., J. Grimmel, E. Fink, and C. Hughes, 'Becoming School-Parents: Contrasts between Mothers' and Fathers' Speech Samples and Links with Psychological Distress and Household Disorder', *European Early Childhood Education Research Journal*, August 23, 2023, pp. 1–16.

Díaz, B., M. Nussbaum, S. Greiff, and M. Santana, 'The Role of Technology in Reading Literacy: Is Sweden Going Back or Moving Forward by Returning to Paper-Based Reading?', *Computers & Education*, Vol. 213, May 2024, p. 105014.

Diaz-Sarachaga, J.M., and J. Longo Sarachaga, 'Lights and Shadows in the Operationalization of Sustainability through the 2030 Agenda in Spanish Universities', *International Journal of Sustainability in Higher Education*, No. 02–2024, February 2024.

Docter, M.W., T.N.D. De Vries, H.D. Nguyen, and H. Van Keulen, 'A Proof-of-Concept of an Integrated VR and AI Application to Develop Classroom Management Competencies in Teachers in Training', *Education Sciences*, Vol. 14, No. 5, May 16, 2024, p. 540.

Dodd, A.L., G. Punton, J.M.A. McLaren, E. Sillence, and N. Byrom, 'How Can the University Environment Support Student Quality of Life? A Novel Conceptual Model', *Education Sciences*, Vol. 14, No. 5, May 17, 2024, p. 547.

Douwes, R., J. Metselaar, H. Korpershoek, N. Boonstra, and G.H.M. Pijnenborg, 'Role Perceptions of Teachers Concerning Student Mental Health in Higher Education', *Education Sciences*, Vol. 14, No. 4, April 3, 2024, p. 369.

Elahi Shirvan, M., E. Saeedy Robat, A. Alamer, N.M. Lou, and E. Barabadi, 'A Multilevel Meta-Analysis of Language Mindsets and Language Learning Outcomes in Second Language Acquisition Research', *Educational Psychology Review*, Vol. 36, No. 1, March 2024, p. 15.

Epstein, E.M.B., N.C. Ngaosi, N. Khalayleh, L.M. Garces, and J. Pedota, 'Beyond Legal Constraints: Understanding Barriers to Humanizing Responses in the Aftermath of Hate Speech at Private Universities', *Education Sciences*, Vol. 14, No. 2, February 8, 2024, p. 175.

Essa, A., 'The Future of Postsecondary Education in the Age of AI', *Education Sciences*, Vol. 14, No. 3, March 19, 2024, p. 326.

European Commission. Directorate General for Education, Youth, Sport and Culture., *Wellbeing and Mental Health at School: Guidelines for School Leaders, Teachers and Educators.*, Publications Office, LU, 2024.

Fazlul, I., C. Koedel, and E. Parsons, 'Using Predicted Academic Performance to Identify At-Risk Students in Public Schools', *Educational Evaluation and Policy Analysis*, January 16, 2024, p. 01623737231212163.

Feierabend, S., S. Hasenhütl, M. Paechter, S. Luttenberger, M.W.T. Eglmaier, and L. Eichen, 'Increasing Self-Concept and Decreasing Gender Stereotypes in STEM through Professional Development for Early Childhood Educators', *Education Sciences*, Vol. 14, No. 1, January 11, 2024, p. 81.

Fernández-Cerero, J., J. Cabero-Almenara, and M. Montenegro-Rueda, 'Technological Tools in Higher Education: A Qualitative Analysis from the Perspective of Students with Disabilities', *Education Sciences*, Vol. 14, No. 3, March 14, 2024, p. 310.

Forbes, M.H., S.M. Lord, and P. Díaz-Montiel, 'Celebrating and Leveraging Classroom Geographic and Cultural Diversity to Enhance Student Learning', *Education Sciences*, Vol. 14, No. 3, March 8, 2024, p. 287.

Freude, L., J. Bonet, and C.C. Calvet, 'Assessing Training on Digital Gender Based Violence in Higher Education Taking into Account Gender and Sexual Orientation', *European Journal of Education*, Vol. 59, No. 2, June 2024, p. e12615.

Fu, Y.C., J.H. Chen, K.C. Cheng, and X.F. Yuan, 'Measuring College Students' Multidisciplinary Learning: A Novel Application of Natural Language Processing', *Higher Education*, Vol. 87, No. 4, April 2024, pp. 859–879.

Galindo-Melero, J., P. Sanz-Angulo, S. De-Diego-Poncela, and Ó. Martín, 'Analysis of Academic Results from Implementation of a Flipped Learning Methodology in a Subject in Higher Engineering Education', *European Journal of Education*, Vol. 59, No. 2, June 2024, p. e12611.

Ging, D., J. Ringrose, B. Milne, T. Horeck, K. Mendes, and R. Castellini Da Silva, 'Moving beyond Masculine Defensiveness and Anxiety in the Classroom: Exploring Gendered Responses to Sexual and Gender Based Violence Workshops in England and Ireland', *Gender and Education*, Vol. 36, No. 3, April 2, 2024, pp. 230–247.

González-Cespón, J.L., J.A. Alonso-Rodríguez, S. Rodríguez-Barcia, P.P. Gallego, and M.R. Pino-Juste, 'Enhancing Employability Skills of Biology Graduates through an Interdisciplinary Project-Based Service Learning Experience with Engineering and Translation Undergraduate Students', *Education Sciences*, Vol. 14, No. 1, January 16, 2024, p. 95.

Gulson, K.N., and S. Sellar, 'Anticipating Disruption: Artificial Intelligence and Minor Experiments in Education Policy', *Journal of Education Policy*, January 15, 2024, pp. 1–16.

Guo, J., H.W. Marsh, P.D. Parker, and X. Hu, 'Cross-Cultural Patterns of Gender Differences in STEM: Gender Stratification, Gender Equality and Gender-Equality Paradoxes', *Educational Psychology Review*, Vol. 36, No. 2, June 2024, p. 37.

Håkansson Lindqvist, M., P. Mozelius, J. Jaldemark, and M. Cleveland Innes, 'Higher Education Transformation towards Lifelong Learning in a Digital Era – a Scoping Literature Review', *International Journal of Lifelong Education*, Vol. 43, No. 1, January 2, 2024, pp. 24–38.

Hartonen, V.R., S. Pöllänen, L. Karlsson, and P. Väisänen, 'Asylum Seekers' Experiences of Participatory Barriers in the Educative Pre-Integrational Programmes', *European Educational Research Journal*, Vol. 23, No. 3, May 2024, pp. 366–386.

Homerin, N., and R.L. Dodds, 'The Transition from Early Intervention to Preschool for Children with Multiple Disabilities: A Narrative Review', *Early Child Development and Care*, Vol. 194, No. 3, February 17, 2024, pp. 350–365.

Honkasilta, J., and A. Koutsoklenis, 'International Perspectives on Inclusion in Education: Exploring Common Ground from Different Angles', *Education Sciences*, Vol. 14, No. 5, May 14, 2024, p. 532.

Işıkoğlu, N., and M. Güzen, 'The Promise of Digital Storytelling for Kindergarteners: Language and Technology Skills', *Early Child Development and Care*, Vol. 194, No. 2, January 25, 2024, pp. 195–207.

Jaoul-Grammare, M., 'Gendered Professions, Prestigious Professions: When Stereotypes Condition Career Choices', *European Journal of Education*, Vol. 59, No. 2, June 2024, p. e12603.

Jaquette, O., and K.G. Salazar, 'A Sociological Analysis of Structural Racism in "Student List" Lead Generation Products', *Educational Evaluation and Policy Analysis*, Vol. 46, No. 2, June 2024, pp. 276–308.

Kang, J., Y. Zhou, R.J. Rajarathinam, Y. Tan, and D.W. Shaffer, 'Unveiling Joint Attention Dynamics: Examining Multimodal Engagement in an Immersive Collaborative Astronomy Simulation', *Computers & Education*, Vol. 213, May 2024, p. 105002.

Kassis, W., A. Vasiou, C. Govaris, C. Favre, D. Aksoy, and U. Graf, 'Social and Individual Factors Predicting Students' Resilience: A Multigroup Structural Equation Model', *Education Sciences*, Vol. 14, No. 1, December 22, 2023, p. 15.

Kealy, C., V. McCauley, and P. Flynn, 'Socio-Economically Disadvantaged Male Students' Hesitancy to Study Biology in Ireland: Factors Effecting Intent in the Transition to Upper Secondary School', *Education Sciences*, Vol. 14, No. 4, March 23, 2024, p. 341.

Khamzina, K., A. Stanczak, C. Brasselet, C. Desombre, C. Legrain, S. Rossi, N. Guirimand, and F. Cilia, 'Designing Effective Pre-Service Teacher Training in Inclusive Education: A Narrative Review of the Effects of Duration and Content Delivery Mode on Teachers' Attitudes Toward Inclusive Education', *Educational Psychology Review*, Vol. 36, No. 1, March 2024, p. 13.

Kim, M.J., 'Scripting Solutions for the Future: The OECD's Advocacy of Happiness and Well-Being', *Comparative Education*, May 19, 2024, pp. 1–17.

King, R.B., Y. Cai, and A.J. Elliot, 'Income Inequality Is Associated with Heightened Test Anxiety and Lower Academic Achievement: A Cross-National Study in 51 Countries', *Learning and Instruction*, Vol. 89, February 2024, p. 101825.

Kitagawa, K., 'Learning and Teaching of Climate Change, Sustainability and Disaster Risk Reduction in Teacher Education in England and Japan', *Journal of Teacher Education for Sustainability*, Vol. 25, No. 2, February 1, 2024, pp. 5–20.

Konca, A.S., B. Izci, and A. Simsar, 'Evaluating Popular STEM Applications for Young Children', *European Early Childhood Education Research Journal*, Vol. 32, No. 1, January 2, 2024, pp. 130–146.

Köpeczi-Bócz, T., 'The Impact of a Combination of Flipped Classroom and Project-Based Learning on the Learning Motivation of University Students', *Education Sciences*, Vol. 14, No. 3, February 26, 2024, p. 240.

Altes, T.K., M. Willemse, S.L. Goei, and M. Ehren, 'Higher Education Teachers' Understandings of and Challenges for Inclusion and Inclusive Learning Environments: A Systematic Literature Review', Educational Research Review, Vol. 43, May 2024, p. 100605.

Kushnir, I., 'Interview Materials: Europeanisation Agenda and Membership in the European Higher Education Area Post-2020: Stakeholders' Perspectives from the UK, Germany, France and Italy [Dataset]', Nottingham Trent University, 2022.

Kushnir, I., E.A. Eta, M.F. Mbah, and C.-R. Kennedy, 'The Orchestration of a Sustainable Development Agenda in the European Higher Education Area', *International Journal of Sustainability in Higher Education*, Vol. 25, No. 1, January 2, 2024, pp. 143–160.

Lacruz-Pérez, I., G. Pastor-Cerezuela, R. Tárraga-Mínguez, and T. Lüke, 'Implicit and Explicit Measurement of Pre-Service Teachers' Attitudes toward Autism Spectrum Disorder', *European Journal of Special Needs Education*, Vol. 39, No. 1, January 2, 2024, pp. 1–18.

Lafuente-Lechuga, M., J. Cifuentes-Faura, and Ú. Faura-Martínez, 'Teaching Sustainability in Higher Education by Integrating Mathematical Concepts', *International Journal of Sustainability in Higher Education*, Vol. 25, No. 1, January 2, 2024, pp. 62–77.

Lampropoulos, G., and A. Sidiropoulos, 'Impact of Gamification on Students' Learning Outcomes and Academic Performance: A Longitudinal Study Comparing Online, Traditional, and Gamified Learning', *Education Sciences*, Vol. 14, No. 4, April 1, 2024, p. 367.

Lebenhagen, C., and J. Dynia, 'Factors Affecting Autistic Students' School Motivation', *Education Sciences*, Vol. 14, No. 5, May 13, 2024, p. 527.

Lindström, E., and M. Eklund Heinonen, 'Initial Assessment of First Language Literacy Resources for Adult Instruction in Swedish', *Education Sciences*, Vol. 14, No. 5, May 20, 2024, p. 550.

Liu, Y., M.A. Groen, and K. Cain, 'The Association between Morphological Awareness and Reading Comprehension in Children: A Systematic Review and Meta-Analysis', *Educational Research Review*, Vol. 42, February 2024, p. 100571.

Looney, L., E.H. Wong, K.P. Rosales, J.M. Bacon, and D.J. Wiest, 'Supporting Learning Differences: Effects of Cognitive Training on Cognitive Abilities in a School-Based Sample', *Education Sciences*, Vol. 14, No. 1, January 15, 2024, p. 89.

López, O.S., 'BLACK MALES IN NON-STEM AND STEM OCCUPATIONS', *Journal of Women and Minorities in Science and Engineering*, Vol. 30, No. 4, 2024, pp. 103–129.

Macagno, A., B. Ragaglia, A. Henning, and D. Bulgarelli, 'Inclusive Approaches in Italian Early Childhood Education and Care: The View of Practitioners', *Education Sciences*, Vol. 14, No. 4, April 6, 2024, p. 385.

Malkin, T., The Right Conditions: Systemic Enablers for a Culture of Research Engagement in Education, OECD Education Spotlights, Vol. 9, Vol. 9, OECD Education Spotlights, January 26, 2024.

Margaça, C., J.C. Sánchez-García, B. Hernández Sánchez, and S.L. Mangas, 'Environmental Values and Education in Spanish Universities: A Questionnaire Validation', *International Journal of Sustainability in Higher Education*, Vol. 25, No. 1, January 2, 2024, pp. 161–181.

Martín-Cudero, D., R. Guede-Cid, P. Tolmos, and A.I. Cid-Cid, 'Development of a Mathematical Experience from a STEM and Sustainable Development Approach for Primary Education Pre-Service Teachers', *Education Sciences*, Vol. 14, No. 5, May 5, 2024, p. 495.

Matei, A., and M. Ghența, 'Quality of Life of Children from Families Affected by Migration: The Role of Educational Policies', *Education Sciences*, Vol. 14, No. 2, February 7, 2024, p. 173.

McCambly, H., and Q. Mulroy, 'Constructing an Educational "Quality" Crisis: (E)Quality Politics and Racialization Beyond Target Beneficiaries', *Educational Evaluation and Policy Analysis*, Vol. 46, No. 2, June 2024, pp. 192–221.

Merke, S., L. Ganushchak, and R. Van Steensel, 'Effects of Additions to Independent Silent Reading on Students' Reading Proficiency, Motivation, and Behavior: Results of a Meta-Analysis', *Educational Research Review*, Vol. 42, February 2024, p. 100572.

Monteiro, S., V. Ribeiro, and C. Molho, 'A 5 Pillars Approach to the Sustainable Development Goals Performance and Reporting in Portuguese Higher Education Institutions. Proposal for an Applied Framework', *International Journal of Sustainability in Higher Education*, Vol. 25, No. 1, January 2, 2024, pp. 104–123.

Morgado, B., and M.N. Sánchez-Díaz, 'Teaching for All: Profile of Faculty Members Who Facilitate the Success and Inclusion of Students with Disability', *European Journal of Special Needs Education*, Vol. 39, No. 2, March 3, 2024, pp. 281–296.

Moriña, A., L. Tontini, and V.H. Perera, 'External Accomplice Factors in University Success: Narratives of Graduates with Invisible Disabilities in Italy', *International Journal of Educational Research*, Vol. 124, 2024, p. 102316.

Mudhar, G., S.K. Ertesvåg, and E. Pakarinen, 'Patterns of Teachers' Self-Efficacy and Attitudes toward Inclusive Education Associated with Teacher Emotional Support, Collective Teacher Efficacy, and Collegial Collaboration', *European Journal of Special Needs Education*, Vol. 39, No. 3, May 3, 2024, pp. 446–462.

NESET, 'Addressing the Gender Gap in STEM Education across Educational Levels', *NESET*, 2024. https://nesetweb.eu/en/resources/library/addressing-the-gender-gap-in-stem-education-in-schools/.

———, *Student and Staff Mental Well-Being in European Higher Education Institutions: Analytical Report.*, Publications Office, LU, 2024.

Nieminen, J.H., A. Moriña, and G. Biagiotti, 'Assessment as a Matter of Inclusion: A Meta-Ethnographic Review of the Assessment Experiences of Students with Disabilities in Higher Education', *Educational Research Review*, Vol. 42, February 2024, p. 100582.

OCDE, *Strengthening Higher Education-School Partnerships for Green and Digital Innovation*, OECD Education Spotlights, Vol. 8, Vol. 8, *OECD Education Spotlights*, December 15, 2023.

Okeke, C.I., N.P. Mudzielwana, and M. Mokhele-Makgalwa, 'Practitioners' Professional Development Needs From a Sustainability Perspective: The Impact of Some Demographic Features', *Journal of Teacher Education for Sustainability*, Vol. 25, No. 2, December 1, 2023, pp. 128–142.

Oleksiyenko, A., and S. Terepyshchyi, "Hope despite All Odds': Academic Precarity in Embattled Ukraine', *Teaching in Higher Education*, Vol. 29, No. 3, April 2, 2024, pp. 741–755.

Pérez Torres, M., D. Couso Lagarón, and C. Marquez Bargalló, 'Evaluation of STEAM Project-Based Learning (STEAM PBL) Instructional Designs from the STEM Practices Perspective', *Education Sciences*, Vol. 14, No. 1, December 31, 2023, p. 53.

Pi, Z., L. Zhang, X. Zhao, and X. Li, 'Peers Turning on Cameras Promotes Learning in Video Conferencing', *Computers & Education*, Vol. 212, April 2024, p. 104986.

Portela-Pino, I., J. Domínguez-Alonso, and M. Alvariñas-Villaverde, 'Can We Measure the Level of Socio-Emotional Competencies of Adolescents?', *Education Sciences*, Vol. 14, No. 4, April 10, 2024, p. 395.

Posti-Ahokas, H., and H. Janhonen-Abruquah, 'Towards Equity Literacy: Exploratory Enquiry with Finnish Student Teachers', *European Journal of Teacher Education*, July 20, 2021, pp. 1–18.

Quigley, M., C. Smith, E. Stocker, and A. Bradley, 'University Students' Perceptions of Graduate Employer Selection Tests', *Education + Training*, November 28, 2023.

Rappleye, J., H. Komatsu, Y. Uchida, J. Tsai, and H. Markus, 'The OECD's 'Well-Being 2030' Agenda: How PISA's Affective Turn Gets Lost in Translation', *Comparative Education*, Vol. 60, No. 2, April 2, 2024, pp. 239–258.

Rihter, J., M.K. Babuder, and M.V. Zuljan, 'Collaboration between Special Education Teachers and Visual Arts Education Teachers in Working with Pupils with Severe Specific Learning Difficulties and Its Relationship to Professional Development', *European Journal of Special Needs Education*, Vol. 39, No. 1, January 2, 2024, pp. 19–32.

Rodríguez-Jiménez, M.D.C., I. Puerta-Araña, A.I. González-Herrera, and M.C. González-Afonso, 'Analysis of Quality of Life of Autistic Students on the Canary Islands during the COVID-19 Pandemic and the Educational Response Offered', *Education Sciences*, Vol. 14, No. 1, January 21, 2024, p. 111.

Rosa, M.R.D., C. Boscarioli, and K.R.D. Freitas Zara, 'A Systematic Review of the Trends and Patterns of Sustainability Reporting in Universities', *International Journal of Sustainability in Higher Education*, Vol. 25, No. 3, February 19, 2024, pp. 556–576.

Saari, A., and M. Decuypere, 'Governing by Prototype and Proto-Practice: Topological Configurations of Future Classroom Labs', *Journal of Education Policy*, January 11, 2024, pp. 1–19.

Saman, A., and H. Wirawan, 'Predicting Students' Soft Skills: The Role of Psychological Capital, Psychological Well-Being and Grade Levels', *Education + Training*, Vol. 66, No. 1, February 19, 2024, pp. 17–34.

Santos, R., A. Santiago, and C. Cruz, 'Problem Posing and Problem Solving in Primary School: Opportunities for the Development of Different Literacies', *Education Sciences*, Vol. 14, No. 1, January 16, 2024, p. 97.

Setty, E., J. Ringrose, and J. Hunt, 'From 'Harmful Sexual Behaviour' to 'Harmful Sexual Culture': Addressing School-Related Sexual and Gender-Based Violence among Young People in England through 'Post-Digital Sexual Citizenship'', *Gender and Education*, Vol. 36, No. 5, July 3, 2024, pp. 434–452.

Sharif, H., and A. Atif, 'The Evolving Classroom: How Learning Analytics Is Shaping the Future of Education and Feedback Mechanisms', *Education Sciences*, Vol. 14, No. 2, February 8, 2024, p. 176.

Shekhar, P., J. Handley, A.L. Ruiz, and L. Bosman, 'Women STEM Faculty's Intentions to Engage in Entrepreneurship Education Programs', *Higher Education*, Vol. 87, No. 6, June 2024, pp. 1865–1884.

Sihvonen, P., R. Lappalainen, J. Herranen, and M. Aksela, 'Promoting Sustainability Together with Parents in Early Childhood Education', *Education Sciences*, Vol. 14, No. 5, May 16, 2024, p. 541.

Sirem, Ö., 'A Study on Parents' Awareness of Inclusive Education', *European Journal of Special Needs Education*, Vol. 39, No. 2, March 3, 2024, pp. 297–310.

Smith, C.R., 'WHY (AND HOW) DO WOMEN ENGINEERS STAY?: A POSITIVE PSYCHOLOGY APPROACH TO UNDERSTANDING THE CAREER SUSTAINABILITY OF WOMEN IN ENGINEERING', *Journal of Women and Minorities in Science and Engineering*, Vol. 30, No. 3, 2024, pp. 99–122.

Spangenberger, P., S.-C. Freytag, and S.M. Geiger, 'Embodying Nature in Immersive Virtual Reality: Are Multisensory Stimuli Vital to Affect Nature Connectedness and pro-Environmental Behaviour?', *Computers & Education*, Vol. 212, April 2024, p. 104964.

Tanure Alves, M.L., and M.J. Carvalheiro Campos, 'School Physical Education and Disabled Students: What about Paralympic Sports?', *Journal of Curriculum Studies*, Vol. 56, No. 2, March 3, 2024, pp. 191–206.

Tapia, E., 'Understanding School Segregation through Micro-Changes: Evidence from Upper Secondary Education in Stockholm', *Journal of Education Policy*, December 3, 2023, pp. 1–20.

Tzimas, D.E., and S.N. Demetriadis, 'Impact of Learning Analytics Guidance on Student Self-Regulated Learning Skills, Performance, and Satisfaction: A Mixed Methods Study', *Education Sciences*, Vol. 14, No. 1, January 15, 2024, p. 92.

Venegas Marin, S., L. Schwarz, and S. Sabarwal, 'The Impact of Climate Change on Education and What to Do about It', World Bank, 2024.

Vicol, M.-I., M.-L. Gavriluț, and L. Mâță, 'A Quasi-Experimental Study on the Development of Creative Writing Skills in Primary School Students', *Education Sciences*, Vol. 14, No. 1, January 15, 2024, p. 91.

Vieluf, S., and M.N. Sauerwein, 'Does a Lack of Teachers' Recognition of Students with Migration Background Contribute to Achievement Gaps?', *European Educational Research Journal*, Vol. 23, No. 1, January 2024, pp. 3–27.

Vierra, K.D., D.R. Beltran, L. Denecker, and R.D. Robnett, '"Research Mentors Should Support Students of Color by Taking an Extra Step." Undergraduates' Reasoning about Race and STEM Research Mentorship', *Education Sciences*, Vol. 14, No. 2, February 4, 2024, p. 162.

Vonkova, H., O. Papajoanu, and A. Moore, 'Foreign Language Learning Motivation and the Socioeconomic Status of Czech Lower Secondary Students: An Analysis of Mediating Factors', *International Journal of Educational Research*, Vol. 124, 2024, p. 102302.

Vue, R., K.T. Ly, T. Porter, and A.A. Aguilar, 'Feeling the Threat of Race in Education: Exploring the Cultural Politics of Emotions in CRT-Ban Political Discourses', *Educational Evaluation and Policy Analysis*, Vol. 46, No. 2, June 2024, pp. 222–248.

Wang, F., and A.C.K. Cheung, 'Robots' Social Behaviors for Language Learning: A Systematic Review and Meta-Analysis', *Review of Educational Research*, January 3, 2024, p. 00346543231216437.

'Wellbeing and Mental Health at School: Guidelines for School Leaders, Teachers and Educators.', Publications Office, 2024.

Westphal, A., E. Richter, R. Lazarides, and Y. Huang, 'More I-Talk in Student Teachers' Written Reflections Indicates Higher Stress during VR Teaching', *Computers & Education*, Vol. 212, April 2024, p. 104987.

White, N., J. Milicev, D.R.R. Bradford, A. Rodger, and M. Gardani, 'The Mental Labyrinth of Postgraduate Research: A Qualitative Study of Postgraduate Mental Health and Wellbeing and the Impact of the Supervisory Relationship', *Higher Education*, Vol. 87, No. 5, May 2024, pp. 1211–1226.

World Bank, 'Human Development Update in Focus: Disability and Inclusion.', 2024.

Yarritu, I., N. Idoiaga Mondragon, I. Axpe Saez, and C. Arriaga, 'The Representation of Sustainability among University Teachers: Knowing the Present to Change the Future', *International Journal of Sustainability in Higher Education*, Vol. 25, No. 2, January 23, 2024, pp. 319–337.

Yigit-Gencten, V., M. Gultekin, R. Ozen Uyar, and F. Aydemir, 'Gender in Children's Literature and Kindergartener's Responses to Gender in Interactive Read-alouds', *European Journal of Education*, Vol. 59, No. 2, June 2024, p. e12609.

Zabala-Eisshofer, C., K. Somerville, and K. Wiley, 'Recommending Reform: A Critical Race and Critical Policy Analysis of Research Recommendations About School Resource Officers', *Educational Evaluation and Policy Analysis*, Vol. 46, No. 2, June 2024, pp. 358–384.

Zając, T., F. Perales, W. Tomaszewski, N. Xiang, and S.R. Zubrick, 'Student Mental Health and Dropout from Higher Education: An Analysis of Australian Administrative Data', *Higher Education*, Vol. 87, No. 2, February 2024, pp. 325–343.