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Knowledge about Competences Increasing Resilience to Crises in the Modern Business Sector: Results of the Polish University Project

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Abstract: The COVID-19 global pandemic has caused an unprecedented disturbance in higher education and the business services sector. In the 2014–2020 financial perspective, the Operational Programme Knowledge Education Development has constituted a response to challenges and an instrument to execute the Europe 2020 Strategy. However, the Programme was not designed to prevent crises, and neither did it foresee the pandemic which surprised the whole world. Despite this, higher education institutions that implemented projects co-financed with the EU funds had to face the "black swan" and ensure the continuity of their activities while improving their resilience to crises. The COVID-19 pandemic demonstrated how important knowledge management and resilience-building skills are for students to adapt and grow stronger in the face of a crisis. Does higher education teach crisis-resistant competences? As we know from practice and literature, the knowledge gap as regards crisis-resistant competencies is enormous, and the relevant university programmes require strengthening. Therefore, we conducted a literature review about knowledge management in complex crises and conducted research to identify competences that increase resilience to crises. The aim of the article was to examine to what extent the support implemented in the Polish university project contributed to the increase in indicators (output, direct result) and to what extent the level of competences of the project participants increased, including those competences that allowed the participants to adapt to the labour market during the COVID-19 pandemic. For the needs of the study, we used the competence balance method and the measurement of a degree of ratio implementation according to the criteria applied. The results of the study proved that the ratios rose and the project contributed to increasing competences in the project's participants, improving their crisis resilience. The conclusions of the study allowed us to make recommendations regarding the emergent knowledge strategies about the European Union's future agenda as well as about knowledge management and university training programs for resilient skills.

Keywords: higher education; competences; entrepreneurship competences; knowledge management; knowledge strategies; modern business service sector; sustainable development; COVID-19 pandemic

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1. Introduction

The COVID-19 pandemic, officially announced on 11 March 2020 by the World Health Organisation [1], caused an unprecedented disturbance in higher education all over the world. Educational institutions, including those of the European Union (EU) member states, were forced to suddenly shift to on-line education, and learners needed to adapt to remote learning. The spread of coronavirus made governments of numerous countries take extreme measures of introducing a lockdown to industries [2]. The pandemic, emerging as a "great crisis", affected many countries at the same time, generating social, economic, and

health disturbances in the economic systems, requiring urgent solutions, that individuals do not yet know how to shape [3]. Although there are different definitions, the concept of crisis is mainly related to an extreme, unexpected, and unpredictable event that requires a response from organisations [4,5]. The COVID-19 pandemic proved how important knowledge management and organisational resilience are in crises for dealing with uncertainty generated by the absence of knowledge [6–8]. It is expected that conclusions will be drawn on the basis of the crisis regarding the educational system, training, and digital education as part of the European education area [9] and OECD policy [10]. In response to the COVID-19 pandemic situation, priorities of education policy have become clearer in an attempt to make educational systems and training more socially inclusive and more resilient to crises [9]. These competencies (such as entrepreneurship skills) are expected to be developed through relevant training programs [11]. As we know, entrepreneurial orientation and innovative ventures add value to improve the economy through job creation, making this a priority for many governments [12].

Undoubtedly, the outbreak of the pandemic has been the largest "black swan" for a century, and the change it has brought seems to be ground-breaking. Today, the key challenges are ensuring the continuity of operations as well as boosting an overall level of resilience that is seen as the entrepreneur's ability to adapt to change [13,14]. Moreover, entrepreneurship has been recognised as a key element for local and regional development [14,15]. Despite the importance that entrepreneurs have for economic development and innovation, the issue of resilience, and the factors that strengthen it in individuals, have not been studied extensively [14,16]. However, managers in times of crises must redefine the organisation's critical dynamic capabilities based on new knowledge structures and knowledge competences [14,17–19]. It also notes the need for business education to shift from a classical knowledge transfer and learning process based on knowledge accumulation to the development of generic competencies [8,17]. Additionally, an important element of a company's ability to exploit new opportunities will be managerial competence in developing and refining business models [20]. Organisations must redefine the critical dynamic capabilities based on new knowledge structures and knowledge competences [7,18–21]. Entities from various sectors of the economy, including higher education or modern business services (MBS), need to accept the "change or perish" paradigm. In the last two years, the number of entities comprising the MBS has decreased. The sector has entered the maturity stage, which is characterised by the consolidation of activities and is subject to profound changes whose pace is bound to increase. The catalyst for changes will be the digital transformation and fostering sustainable development through the European digital single market [22]. Therefore, although the economic structures are the most affected by crises, they are also recognised as catalysts for recovery and economic growth thanks to their role as an engine of innovation and job creation [23].

From the 2014–2020 financial perspective, the National Centre for Research and Development in Poland (NCRD) supported the development of human resources potential for the modern business services sector by acting as an intermediary in transferring the funds from the European Social Fund via the Operational Programme Knowledge Education Development (OP KED) [24]. The program was a response to long-term challenges that Europe faces concerning globalisation, economic development, the quality of public policies, demographic changes, or investments in human capital [25]. The objective of OP KED was the improvement in policies and public measures supporting the labour market, education, and the entire economy. EU grants have helped to strengthen higher education directed at the development, promotion of innovation, and transnational collaboration. Through its activities, the NCRD has brought together business and academia, which has translated into increased innovativeness of the entire economy, including the sustainable development of the modern business services sector in Poland [24].

The aim of this article is the assessment of the results of support for the participants of the project entitled "Competences of tomorrow's employees in the business services sector" by applying the relevant evaluation criteria (accuracy, efficiency, and sustainability)

required in the BPO (Business Process Outsourcing) competition as part of development of the competency of crisis resilience. This project was realised by the Siedlce University of Natural Sciences and Humanities. It aimed to investigate the extent to which the support implemented in the project contributed to the increase in (product, direct result) ratios and the extent to which the project participants' competence levels rose, including these competences which allowed the participants to adapt to the labour market during the COVID-19 pandemic. The main research problem is as follows: how far can the level of the key ratios stimulate the support effects and resilience for project participants? The hypothesis corresponding with the problem is as follows: the higher the key ratio, the stronger the support effects for project participants and the stronger their resilience as part of competency development. Detailed research problems are as follows: (RQ1) To what extent and which product ratios increase support effects for project participants? (RQ2) To what extent and which direct results ratios affect an increase in support effects for project participants? (RQ3) Which resilience-building competences (induced by the COVID-19 pandemic) were strengthened in the project's participants? The following detailed hypotheses correspond to these problems: (H1) Product ratios related to apprenticeship schemes increase support effects for project participants to the largest extent. (H2) Result ratios related to continuation of education and employment of project participants influence an increase in the effects. (H3) Project participants strengthened key competences, including the entrepreneurial ones increasing resilience to crises (induced by the COVID-19 pandemic). Verification of the research hypotheses was conducted through the study of project participants' competencies (at the "opening" and "closing" of the project) and monitoring success ratios (those of product and direct result), as well as the employability ratio after closing the project—at the time when the COVID-19 pandemic broke out. As a result, key competencies, including entrepreneurship, were presented—those of crucial importance for the MBS sector (BPO, IT, SSC, R&D) during the crisis.

This paper is structured as follows: part 1 introduces the background of the research and highlights the concepts of emergent knowledge strategies induced by the pandemic. Part 2 describes the related literature on knowledge management and the key competences that ensure resilience, as well as the OP KED for sustainable development. Part 3 presents the methodology of our research project. Part 4 describes the results obtained, such as the effects on project participants in terms of the criterion for assessing relevance, sustainability, and acquired competences for increasing resilience to crises. This part ends with the authors' proposal of the competences increasing resilience to crises in MBS and mechanism of adjusting students' competence to the needs of the modern business services sector (in the context of sustainable spatial development and space polarisation). Part 5 emphasises the importance of a comparative discussion between the results obtained and the relevant literature and presents the main implications of our research project. Part 6 presents the authors' proposal for competences to enhance crisis resilience in MBS and a mechanism for aligning student competences with the needs of the modern business services sector (in the context of spatial sustainability and spatial polarisation).

2. Literature Review

2.1. Knowledge Management, Knowledge Strategies, and Resilience in the Crisis Period

In knowledge-based economy, knowledge becomes the strategic resource of any organisation, and knowledge management has emerged as a result of development of knowledge-based economy as well as information technology [8,19]. According to Bratianu (2021), knowledge is about action and is shaped by values, ethics, and morality while it is created in the minds of people and then through a "spiral process is integrated and developed into organisational knowledge" [8]. At this point, we note that the knowledge creation elements are as follows: knowledge assets which include the outputs, inputs, and brokers of the knowledge creation process, knowledge creation through the transformation of tacit knowledge to explicit knowledge, and the communal perspective for knowledge creation [26,27].

It is believed that to ensure organisational resilience, managers need to consider the individual psychosocial effects of fear perception, as well as the organisational facilitators of business transformation and survival [28,29]. Therefore, it is necessary to provide: "appropriate social support, guidance and training, find the most effective leadership techniques and intervene when necessary, and implement appropriate emerging protective work policies and consider additional funding alternatives to ensure liquidity during a crisis" [28]. Among other reasons, this is why government support and programmes relying on digital transformation during COVID-19 are so important [30]. The pandemic has proved how important knowledge dynamics are for dealing with uncertainty generated by the absence of knowledge [6,7]. Therefore, there is a vital need to switch business education to developing generic competencies [8,17]. Managers in time of crisis must redefine the organisation's critical dynamic capabilities based on new knowledge structures and knowledge competences [17–19,21]. Managers should know that "knowledge dynamics reflects the continuous interactions between the fields of rational, emotional, and spiritual knowledge based on the principles of thermodynamics and influences decision-making processes in business and economics" [8]. Therefore, there is a new framework of the theory of knowledge-intensive organisations and the nonlinear integrator of knowledge workers, knowledge work, and knowledge processes [8].

Knowledge management integrates operational management with strategic thinking and offers a new perspective of the business environment. Thus, the knowledge management approach should depend on a strategic orientation of the company/organisation toward continuous improvement of existing services or development of completely new services [31]. A knowledge strategy can be designed by considering all processes of knowledge: creation, acquisition, sharing, transformation, transfer, and knowledge use, within the framework of the organisation's knowledge management [7]. Knowledge strategy is defined by "the goal in terms of knowledge resources, the plans about how to achieve, manage and deliver these re-sources, and the internal and external sources and structures that the company will need" [7]. Moreover, a "knowledge strategy is focused on the knowledge a firm needs to achieve a specific long-term goal, and on the practical ways of creating or obtaining that knowledge from the business environment" [7].

According to Bratianu and Bejinaru (2020), "the emergent knowledge strategies should be based on the deep understanding of time perception and future dynamics, on the impact of uncertainty on switching from deterministic to probabilistic thinking, and the black swan phenomena". They also claim that "organizations must create new knowledge structures, knowledge capital, and critical knowledge capabilities based on the theory of knowledge fields and the learning–unlearning process's new dynamics" [7].

2.2. The European Concept of Entrepreneurship—The Key Competence That Ensures Resilience

Competence can be conceptualised in terms of knowledge, abilities, skills, and attitudes displayed in the context of a carefully chosen set of realistic professional tasks which are of an appropriate level of generality [17,32]. Competence is a function of the context where "worker and work form one entity through lived experience of work" [33]. Moreover, the competence construct integrates knowledge, skills, and attitude, which involve all fields of knowledge and the transformation of one type of knowledge into any other one [34]. Based on literature review we prepared a matrix with the following dimensions: occupational–personal and conceptual–operational. This definition refers to four types of competencies [35]: cognitive competence (conceptual–occupational)—which includes knowledge and understanding; functional competence (operational–occupational)—which includes skills; social competence (operational–personal)—which includes attitude and behaviour; meta-competence (conceptual–personal)—which is concerned with the ability to cope with uncertainty, learning, and reflection. There have been changes in the European educational system regarding the key competencies, including the concept of entrepreneurship. The "old" Recommendations of the European Parliament and of the Council of 18 December 2006 on key competences for lifelong learning (2006/962/WE) included [36]:

communication in the mother tongue; communication in foreign languages; mathematical competence and basic competence in science and technology; digital competence; ability to learn; social and civic competences; sense of initiative and entrepreneurship; and cultural awareness and expression. Whereas the new Council Recommendation of 22 May 2018 on key competences for lifelong learning, EU Journal 2018/C/189/01 includes [37]: literacy competence; multilingual competence; mathematical competence and competencies in science, technology, and engineering; digital competence; personal, social and learning to learn competence; citizenship competence; entrepreneurship competence; and cultural awareness and expression competence. In certain aspects, the changes in the scope of competence are significant, for example, the breakdown of linguistic competence into the mother tongue and foreign language was abandoned and replaced by literacy competence and multilingual competence. In another case IT competence was replaced by digital competence due to the role of digitisation in all areas of work and life. There are also changes concerning entrepreneurship: initiative, which was earlier listed in the first position and was linked by a conjunction "and", was deleted, yet the increasing role of entrepreneurship was emphasised. In the new Recommendation, the Entrepreneurship competence refers to the capacity to act upon opportunities and ideas, and to transform them into values for others. It is founded upon creativity, critical thinking, and problem solving, taking initiative and perseverance and the ability to work collaboratively in order to plan and manage projects that are of cultural, social, or financial value [37].

There is also a change regarding the characteristics of knowledge, skills, and attitudes linked with a given competence, including entrepreneurship competence [38]: (1) The entrepreneurship competence requires knowing that there are different contexts and opportunities for turning ideas into action in personal, social, and professional activities, and an understanding of how these arise. It is indispensable to know and understand approaches to project management and planning, including both processes and resources. It is necessary to have an understanding of economics and the social and economic opportunities and challenges facing an employer, organisation, or society. It is also crucial to be aware of ethical principles and challenges of sustainable development and have self-awareness of one's strengths and weaknesses. (2) The entrepreneurship skills are founded on creativity which includes imagination, strategic thinking and problem-solving, and critical and constructive reflection within evolving creative processes and innovation. They include the ability to work both as an individual and collaboratively in teams, to mobilise resources (people and things), and to sustain activity. This includes the ability to make financial decisions relating to cost and value. The ability to effectively communicate and negotiate with others, and to cope with uncertainty, ambiguity, and risk as part of making informed decisions is essential. (3) An entrepreneurial attitude is characterised by a sense of initiative and agency, pro-activity, being forward-looking, courage, and perseverance in achieving objectives and tasks. It includes a desire to motivate others and value their ideas, empathy and taking care of people and the world, and accepting responsibility taking ethical approaches throughout the process.

The new Council Recommendation (EU 2018, p. 1, para 4) reads that nowadays, competence requirements have changed with more jobs being subject to automation, technologies playing a bigger role in all areas of work and life, and entrepreneurial, social, and civic competences becoming more relevant in order to ensure resilience and ability to adapt to change [37]. The COVID-19 pandemic has had an uncertain impact on the global economy, especially for entrepreneurs who have suffered significant consequences. The entrepreneur who suffers from high levels of stress may also suffer from psychological damage such as burnout [39]. The entrepreneur must have the resilience to overcome these crises [14]. Previous studies show that the resilience of entrepreneurs can be a factor of business success because resilient entrepreneurs demonstrate a high degree of tolerance to ambiguity, can adapt to change quickly, take advantage of those situations, and learn from their mistakes [14,40]. Moreover, entrepreneurship has been recognised as a key element for local and regional development [14,15]. Despite the importance that entrepreneurs

have for economic development and innovation, the issue of resilience, and the factors that strengthen it in individuals, has been little studied [14,16]. However, resilience has emerged as an entrepreneurial skill that allows companies to adapt and grow stronger in the face of challenges [14].

2.3. The OP KED for the Economy and Sustainable Development of the Potential of Modern Business Services Sector (MBS)

The development of the modern business services sector (BPO—Business Process Outsourcing; SSC—Shared Services Centers; IT; R&D—Research and Development) is supported by all its stakeholders: organisations attracting major investors in Poland and in Central and Eastern Europe, foreign businesses associations, and other public and private agendas. One of these is the National Centre for Research and Development (NCRD). Until recently, the development of the sector has been primarily based on foreign capital entering the market and its activity. In the Polish business services sector, there are currently 95 investors from the Fortune Global 500 list. They are key players in the global services sector. In 2019, there were 1400 BPO, IT, SSC, R&D centres, and more than 900 business investors operating their service centres (of which 70% were foreign investors). According to the latest estimates of the Association of Business Service Leaders (ABSL), the sector accounts for 3.0–3.5% of Polish GDP [41,42].

The MBS sector has been growing dynamically in Polish metropolises and larger towns. It includes the operations of business processes outsourcing (BPO) centres, shared service centres (SSC), information technology (IT) centres, and research and development (R&D) centres. The employment growth in Poland, according to ABSL, shows that 50,000 persons were employed in the MBS sector in 2008. Whereas in 2019 employment in service centres was 307,000 persons, of which 247,000 in foreign centres (80%) and 60,000 in Polish centres (20%). At the end of Q1 2020, the sector already employed 338,000 persons in over 1500 centres (5.2% of those employed in the enterprise sector). Taking into account multiplier effects, the sector generates 608,000 workplaces in Poland [41,42].

The leading questions that arose were whether smaller regional or subregional towns and cities may become an attractive alternative to large urban centres for BPO/SSC/IT/R&D investments. What are the prospects for the development of (employment) potential in medium-sized cities for new highly advanced sectors of economy [41]? One of the main barriers to the development of these cities is the nature of local labour markets, which hardly ever offer workplaces that require high qualifications or competencies and present attractive opportunities for professional development to young and ambitious people [41]. According to the report entitled "Competences of the future—the fourth industrial revolution in Eastern Europe" by Adecco, employees' competences do not keep pace with the changes resulting from the development of technology [43]. At the same time, a problem was pointed out that higher education does not match the needs of the market and employers. Employers point out problems in the area of employee recruitment and high staff turnover, they also find it difficult to acquire employees with the necessary skills and competences [44].

The NCRD supported the development of new business services sector executing the OP KED. Part of the programme was Priority Axis 3 (PA) "Higher education for the economy and development". Projects implemented as part of this axis were to contribute to achieving six objectives—the first one being "Increasing competences of persons participating in education at the university level which meet the needs of the economy, the labour market and the society". The OP KED project beneficiaries actions referred to [25]: (1) implementation of educational programs of general academic or practical profile, adjusted, based on analyses and projections, to the needs of the economy, the labour market and the society, including: designing and implementation of new study programmes addressing current socio-economic needs, adaptation and implementation of education curricula to the socio-economic needs, measures including employers in the preparation of curricula and their implementation, high quality apprenticeship schemes (measures of

this kind may constitute a separate type of project); (2) increasing competences in persons participating in education at a higher level, in key areas of importance for the country's economy and development, specified based on analyses and projections confirming the need to develop specific competences in concrete areas and based on the needs reported by employers/employers' organisations executed (except for apprentice schemes) by means of, for example, certified trainings and workshops developing competencies, additional classes run in collaboration with employers, additional practical tasks for students carried out on project basis, including project team work, study visits by employers; and (3) development of the higher education institution offer in the scope of the third mission as a forum for social activity, e.g., by means of programmes executed in collaboration with non-governmental organisations, contributing to the development of key competences matching the needs of the labour market, the economy, and the society.

In response to regional needs and objectives of Axis 3 of the OP KED higher education institutions in Poland projects were implemented in 56 locations as part of one of the measures—Measure 3.1, Competences in higher education. The largest numbers of projects were implemented in the following regions of the country: Mazovia, Greater Poland, Silesia, and Lesser Poland—accumulating in total more than half of all implemented projects. The regions with the fewest projects are: Warmia-Masuria and Lubuskie [45]. In Measure 3.1, higher education institutions executed projects following 15 competitions, including the BPO competition. The value of the projects executed by higher education institutions in the BPO competition amounted to PLN 17,335,614.47, and the average value of a project amounted to PLN 1,238,258.18 [45]. Projects were carried out mainly by public higher education institutions, and the objective of the BPO competition was sustainable development by creating favourable conditions for business services to be based in smaller towns with the potential for development in this scope [45].

Summing up, the higher education system in the world and in the European Union member states needs to be adjusted to new needs and requirements. The COVID-19 pandemic, the largest "black swan" we have seen for a century, will accelerate the digital transformation and at the same time it will be (in fact, it already is), a catalyst for changes in higher education as regards educational policies shaping resilience to crises. There will be demand for competences that will play an increasingly important role in the future due to the uncertainty and unpredictability of events in the business environment and the need to manage organisations in conditions of uncertainty, or even the need to manage chaos.

3. Methodology

This paper focuses on the project entitled "Competences of employees of tomorrow in the business services sector", implemented by the Siedlce University of Natural Sciences and Humanities. The value of the project was PLN 1,197,578.40 and the subsidy received from the European Union amounted to PLN 1,009,319.08. The measures taken as part of the project were aimed at 100 students of the university (in Logistics and Management study programmes) and were intended to assess the development of personnel for the business services sector in line with the objective of Axis 3 of the OP KED [46].

Two rounds of recruitment were conducted, including: 1st recruitment round—50 people (20 logistics students and 30 management students); 2nd recruitment round—50 people (30 logistics students and 20 management students). The project activities were aimed at meeting the defined needs and overcoming barriers: economic (high cost of training and low wealth), organisational (low availability of training in the local market), or social (overcoming students' reluctance to further training) [47].

The mechanism of the measures and adjusting students' competence to the needs of the modern business services sector (in the context of sustainable development) are presented in Figure 1.

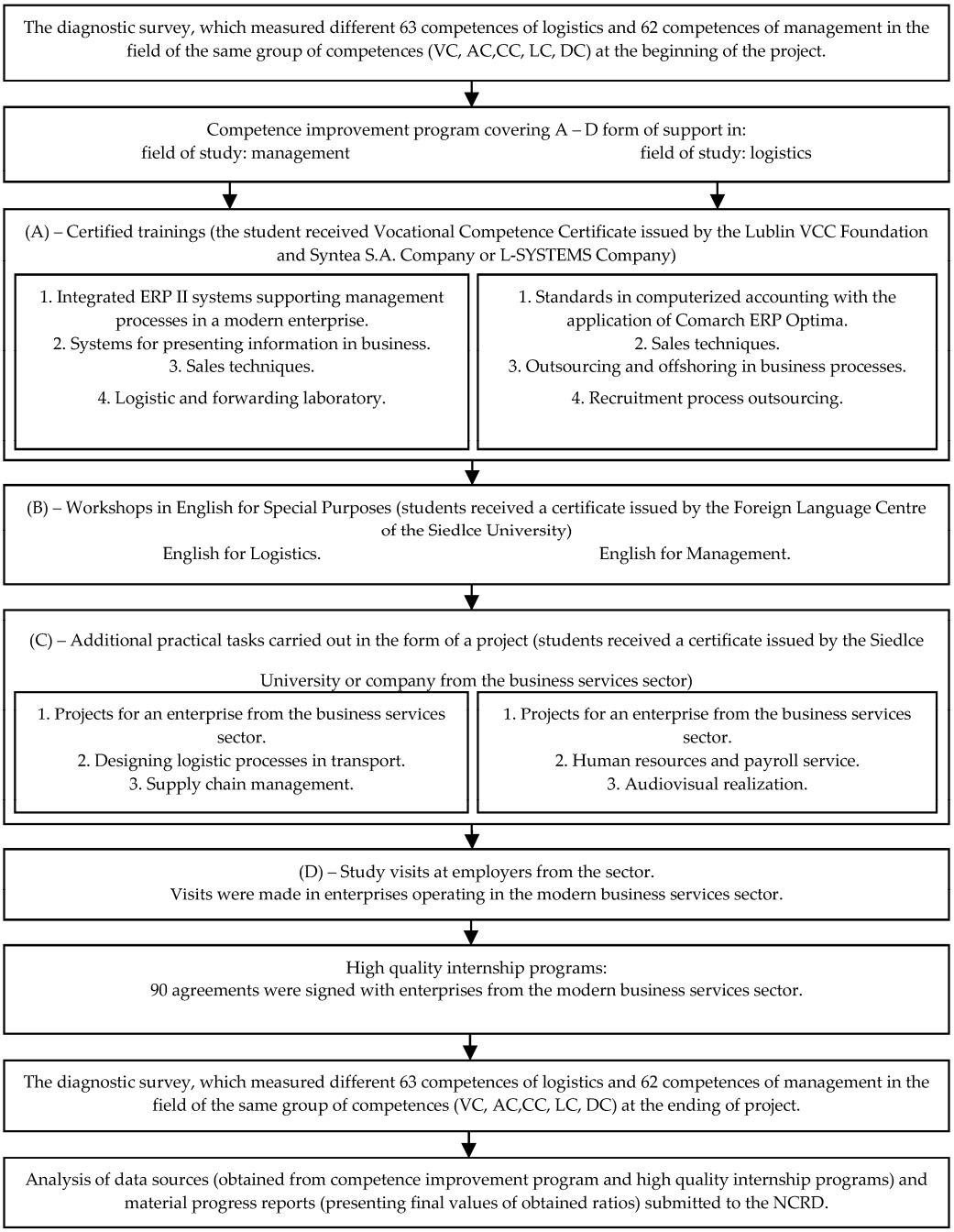

Figure 1. Mechanism of measures and adjusting students' competence to the needs of the modern business services sector (in the context of sustainable development). Source: own elaboration.

The level of competences was verified by a diagnostic survey, where it a scale from 1 to 5 was used to measure the levels before and after the support. A five-grade scale shows the importance of the levels in the form of numbers (1 to 5—where 5 is a very good level of competence; 4—a good level; 3 an average level; 2—a poor level; 1—a bad level) which illustrated the scale of competence development. We assessed the level of 63 competences of students of Logistics (see Table 1) and 62 competences of students of Management (see Table 2), which were specific for different groups of support. Furthermore, the study measured the same group of competences which are required by the European Union, such as: 30 vocational competences (VC), 5 linguistic competences (LC), 9 communicative competences (CC), 11 analytical competences (AC). and 8 or 7 digital competences (DC). To

verify the competence level of the project's participants, we used statistical methods—the arithmetic mean, which synthetically characterised the competences of the participants. This method allowed us to indicate the key competences and the group of sensitive competences, including the soft ones, and the average values from the levels reached are presented in the next section of the article.

Table 1. The 63 competences of logistics students. Source: own work [47].

Item No.	Vocational Competences	Item No.	Digital Competences
VC 1	Knowledge of ERP II class software	DC 1	Skills regarding using ERP II software
VC 2	Knowledge of quality management in the business sector	DC 2	Ability to search for necessary information in the real work environment using IT skills
VC 3	Knowledge of product and warehouse management	DC 3	Ability to use IT tools in the ERP II system
VC 4	Ability to prepare enquiries and sales agreements	DC 4	Ability to make business presentations
VC 5	Ability to prepare purchasing agreements and returns from suppliers	DC 5	Ability to create data bases for enterprises
VC 6	Ability to work on projects for an enterprise in line with the accepted scope of responsibility	DC 6	Ability to plan and organise logistic processes in business entities using EPLedu software
VC 7	Knowledge of cooperation between entities in the business services sector	DC 7	Ability to analyse data using IT tools, ability to make business presentation/ prepare quotations, make data bases for businesses
VC 8	Problem-solving skills		
VC 9	Knowledge of sales	DC 8	Ability to operate specialist software used to perform tasks in the internship position in the entity from the business services sector
VC 10	Knowledge of verbal and non-verbal communication in the sales process		
VC 11	Ability to communicate effectively with a client	**Item No.**	**Analytical Competences**
VC 12	Sales representative skills		
VC 13	Knowledge of logistic processes planning and execution in businesses	AC 1	Ability to recognise and analyse main problems regarding the functioning of supply chains
VC 14	Knowledge of logistic solution implementation in businesses from business services sector	AC 2	Ability to solve problems arising while performing tasks entrusted in EPLedu software
VC 15	Knowledge of overall logistics costs	AC 3	Ability to operate the EPLedu specialist software
VC 16	Ability to implement logistics solutions in businesses from the business services sector	AC 4	Analytical skills regarding the EPLedu functionality: input of business details, data regarding warehouses, fleet (optimising transport routes), product catalogues, and the logistic process
VC 17	Knowledge of main problems in the functioning and development of supply chains	AC 5	Analytical knowledge and skills regarding business management processes
VC 18	Knowledge of competitiveness, cooperation, and dominance in supply chains	AC 6	Ability to work in a group

Table 1. *Cont.*

VC 19	Knowledge of operation decisions in the functioning of supply chains	AC 7	Ability to operate specialist software used to perform tasks in the internship position in the entity from the business services sector
VC 20	Ability to select instruments to fix and develop supply chains		
VC 21	Knowledge of the rules of keeping internal product catalogues	AC 8	Ability to analyse data, data bases for businesses in connection with the implementation of projects for business services sector
VC 22	Knowledge of the role of stock availability in an effective execution of the transportation process		
VC 23	Knowledge of operations of businesses in the business services sector	AC 9	Ability to solve a problem in an innovative manner and to offer a suggestion on its practical implementation in executing projects in the modern business services sector
VC 24	Ability to plan work		
VC 25	Ability to organise own work	AC 10	Ability to analyse available information
VC 26	Ability to effectively perform entrusted tasks	AC 11	Ability to notice processes taking place in an organisation
VC 27	Team-working skills	**Item No.**	**Communicative Competences**
VC 28	Level of responsibility for entrusted tasks		
VC 29	Ability to set and perform priority tasks	CC 1	Ability to communicate effectively with a client, to use effective verbal and non-verbal means of communication in the sales process
VC 30	Knowledge of processes, procedures, tools, methods and techniques used in managing businesses in the business services sector		
Item No.	**Linguistic Competences**	CC 2	Ability to ask questions and test client's needs to control the conversation, to listen actively
LC 1	Knowledge of English	CC 3	Communication skills to work within a new sales model and neurolinguistic programming skills
LC 2	Knowledge of English specialist terminology for logistics	CC 4	Self-presentation, savoir-vivre and image building skills used in the work of a sales representative
LC 3	Ability to build correct English language structures with reference to logistics terminology	CC 5	Ability to conduct negotiations according to the rules and various cultural factors
LC 4	Ability to communicate freely and fluently in English using logistics terminology	CC 6	Ability to prepare letters, documents, analysis and business presentations, communication skills in teamwork
		CC 7	Ability to communicate with the superior
LC 5	Language skills for work (in an internship position) in an organisation from the business services sector	CC 8	Ability to communicate with a client
		CC 9	Ability to resolve conflicts

A clear challenge was the need to indicate the effects of support as part of the project which had closed just before the pandemic and their effectiveness should be proven during the ongoing and unexpected crisis. This project investigates high risk—the risk associated with reaching high product and direct result ratios as well as the employability ratio after the project was closed—that is during the economic lockdown in the aftermath of the COVID-19 pandemic breakout. This situation showed the level of resilience to crises as regards the project and the beneficiary implementing the project (the higher education

institution). Additionally, it disclosed the levels of (key) competence acquisition in the project's participants (students) which helped them to adapt in the face of challenges. Table 1 lists the competences that the logistics students were able to acquire during the project.

Table 2. The 62 competences of management students. Source: own work [47].

Item No.	Vocational Competences	Item No.	Digital Competences
VC 1	Knowledge and practical skills of creating cash registers using comarch ERP optima	DC 1	Ability to support an enterprise which applies full accounting using Comarch ERP Optima software
VC 2	Knowledge and practical skills of creating bank accounts using comarch ERP optima		
VC 3	Ability to analyse payments and financial situation using comarch ERP optima		
VC 4	Ability to analyse settlements/offsets of documents regarding business partners and employees using various methods in comarch ERP optima	DC 2	Ability to support an enterprise which applies revenue and expense ledger (simplified accounting) using Comarch ERP Optima software
VC 5	Knowledge of sales		
VC 6	Knowledge of verbal and non-verbal communication in the sales process	DC 3	The level of skills of preparing a VAT-7, VAT-EU tax forms as well as the annual tax returns and of sending various types of forms (to the e-form system) in Comarch ERP Optima
VC 7	Ability to communicate effectively with a client		
VC 8	Sales representative skills		
VC 9	Knowledge of outsourcing management processes	DC 4	The level of skills of calculating PIT-36, PIT-36L advance payments in the Comarch ERP Optima programme
VC 10	Knowledge of reasons for offshoring		
VC 11	Knowledge of decision-making processes regarding the choice of investment location	DC 5	The ability to use multimedia, i.e., produce and post-produce multimedia content (commercials, promotional videos, animations) for marketing, promotional and advertising purposes
VC 12	Knowledge of partnership building based on the stakeholders theory		
VC 13	Knowledge of capability maturity model (CMM)	DC 6	Ability to analyse data using IT tools, ability to make business presentation/prepare quotations, make data bases for businesses
VC 14	Knowledge of outsourcing in recruitment processes		
VC 15	Ability to prepare business presentations, quotations, data bases for businesses in connection with the implementation of projects for the business services sector	DC 7	Ability to operate specialist software used to perform tasks in the internship position in the entity from the business services sector
VC 16	Knowledge of HR and payroll support for a business entity	**Item No.**	**Analytical Competences**
VC 17	Ability to use HR/payroll methods and tools for businesses personnel records, payroll supervision over trainings records	AC 1	Analytical skills regarding recruitment methods, tools, and processes used by business in BPO
VC 18	Skills relating to preparation of personnel and payroll reports for the management and external clients	AC 2	Ability to maintain personnel registers and employee files
		AC 3	Ability to maintain trainings records

Table 2. *Cont.*

VC 19	Knowledge and skills relating to production and post-production of video content as part of multimedia projects for businesses	AC 4	Ability to calculate pay and prepare payroll including various pay components
		AC 5	Analytical knowledge and skills regarding business management processes
		AC 6	Ability to work in a group
VC 20	Ability to work on projects for an enterprise in line with the accepted scope of responsibility	AC 7	Ability to operate specialist software used to perform tasks in the internship position in the entity from the business services sector
VC 21	Knowledge of cooperation between entities in the business services sector	AC 8	Ability to analyse data, data bases for businesses in connection with the implementation of projects for the business services sector
VC 22	Problem-solving skills	AC 9	Ability to solve a problem in an innovative manner and to offer a suggestion on its practical implementation in executing projects in the modern business services sector
VC 23	Knowledge of operations of businesses in the services sector	AC 10	Ability to analyse available information
VC 24	Ability to plan work	AC 11	Ability to notice processes taking place in an organisation
VC 25	Ability to organise own work		
VC 26	Ability to effectively perform entrusted tasks	**Item No.**	**Communicative Competences**
VC 27	Team-working skills	**CC 1**	Ability to communicate effectively with a client, to use effective verbal and non-verbal means of communication in the sales process
VC 28	Level of responsibility for entrusted tasks	CC 2	Ability to ask questions and test client's needs Ability to control the conversation, to listen actively
VC 29	Ability to set and perform priority tasks		
VC 30	Knowledge of processes, procedures, tools, methods, and techniques used in managing businesses in the business services sector	CC 3	Communication skills to work within a new sales model and neurolinguistic programming skills
Item No.	**Linguistic Competences**	CC 4	Self-presentation, savoir-vivre and image building skills used in the work of a sales representative
LC 1	Knowledge of English	CC 5	Ability to conduct negotiations according to the rules and various cultural factors
LC 2	Knowledge of English specialist terminology for management	CC 6	Ability to prepare letters, documents, analysis and business presentations, communication skills in teamwork
LC 3	Ability to build correct English language structures with reference to management terminology	CC 7	Ability to communicate with the superior
LC 4	Ability to communicate freely and fluently in English using management terminology	CC 8	Ability to communicate with a client
LC 5	Language skills for work (in an internship position) in an organisation from the business services sector	CC 9	Ability to resolve conflicts

Table 2 lists the competences that the management students were able to acquire during the project.

A clear challenge was the need to indicate the effects of support as part of the project which had closed just before the pandemic and their effectiveness should be proven during the ongoing and unexpected crisis. This project was high risk—the risk associated with reaching high product and direct result ratios as well as the employability ratio after the project was closed—that is during the economic lockdown in the aftermath of the COVID-19 pandemic breakout. This situation showed the level of resilience to crises as regards the project and the beneficiary implementing the project (the higher education institution). Additionally, it disclosed the levels of (key) competence acquisition in the project's participants (students) which helped them to adapt in the face of challenges.

In line with the requirements of the NCRD, support results were measured using product ratios and direct result ratios by showing the extent of realisation of a ratio and the diagnosis of participants' competence (in the study at the "opening" and "closing" of the project) as well as the employability of participants 6 months after closing the project. The extent of ratio realisation may be referred to as a success ratio because it responds to the needs of the supported groups (students), illustrating to what extent the (BPO) competition offer was up to date from the perspective of socio-economic expectations and whether or not and to what extent the project implements the policy for the development of personnel for the modern business services sector. The extent of realisation of ratios was measured in line with the following formula:

$$SR_{\mathrm{WP}}, SR_{\mathrm{WRB}} = (WN/WD) \times 100\%$$

where: $SR_{\mathrm{WP}}/SR_{\mathrm{WRB}}$ means the extent of realisation of the product/direct result ratio = value reached since the beginning of the project implementation (cumulatively), *WN*—cumulative value; and *WD*—target value.

The assessment of the results of supporting participants of the project "Competences of tomorrow's employees in the business services sector" used the evaluation criteria required in the BPO competition [45,46] as part of competency development increasing resilience to crises: accuracy—understood as an assessment to what extent the competition offer is up to date (from a socio-economic perspective) and how it realises a long-term development policy and responds to needs of supported groups—students, graduates, authorities and employees of a higher education institution; efficiency—understood as the extent to which the EFS support received under the implemented projects contributed to achieving the objectives of Axis 3 of the OP KED; stability—understood as an assessment of the likelihood of maintaining positive effects of the programme after the completion of financing of the project and an ability to maintain project effects on development processes at a higher institution, region, or country level in a longer run.

Later in the article, we will present an analysis of research outcomes.

4. Results

4.1. RQ1: To What Extent and Which Product Ratios Increase Support Effects for Project Participants?

This research question will allow us to assess support effects for project participants regarding the evaluation criterion of *accuracy*. Table 3 contains values for all product ratios reached in the project together with the extent of their realisation (success ratios).

The target product ratios assumed in the project were achieved in at least 100% in the following scope: number of persons who completed apprenticeship schemes, number of study visits at employers' sites, and number of projects developed as part of project tasks. In case of ratios such as the number of persons covered with the EFS support and adjusted to the needs of the economy, the labour market and the society and the number of persons covered with trainings and counselling regarding digital competence, or the number of persons covered with the EFS support under general academic or practical education programmes and adjusted to the needs of the economy, the labour market,

and the society, the beneficiary exceeded project assumptions by 103%. There was also an increase (by 105.4%) in the product ratio regarding the total number of conducted classes (trainings/workshops, practical tasks in collaboration with entrepreneurs and study visits) by employers. The product ratio regarding the number of hours effected during apprenticeship schemes showed the largest growth (by 151.5%). It is connected with the fact that after 120 h apprenticeship schemes (in the first edition of the project) conducted in entities from the business services sector, employers who were the party to the apprentice scheme agreements expressed their need to extend the duration of the scheme for project participants to 340 h (in the second edition).

Table 3. Product ratios [1].

The Name of the Ratio	Target Value	Value Reached Since the Beginning of the Project Implementation (Cumulatively)	The Extent of Realisation of the Product (%)
The number of hours effected during apprentice schemes	12,000	18,180	151.50
The number of persons covered with trainings and counselling regarding digital competence	100	103	103
The number of persons covered with the EFS support under general academic or practical education programmes and adjusted to the needs of the economy, the labour market and the society	100	103	103
The number of persons covered with the EFS support and adjusted to the needs of the economy, the labour market and the society	100	103	103
The number of persons who completed apprentice schemes	90	90	100
The number of projects developed as part of project tasks	42	42	100
The number of study visits at employers'	16	16	100
The total number of conducted classes (trainings/workshops, practical tasks in collaboration with entrepreneurs and study visits) at employers'	1946	2046	105.14

[1] Source: author based on own work based on material progress.

Hypothesis one was therefore verified positively. Product ratios related to apprenticeship schemes increase support effects for project participants to the largest extent. The assessment of the effects of the project "Competences of tomorrow's employees in the business services sector" regarding *accuracy* was confirmed.

4.2. RQ2: To What Extent and Which Direct Results Ratios Affect an Increase in Support Effects for Project Participants?

This research question will allow us to assess the support effects for project participants regarding the criterion of *stability*. Table 4 presents result ratios achieved owing to the implementation of the project together with the extent of their realisation.

Based on the obtained results we may notice that the aim of the project was achieved in 100% as the number of persons who increased their competences as part of the university measures supported by the EFS amounted to 90. The percentage of university graduates covered with the ESF support who within 6 months of completing their education took up employment with an employer operating in BPO, SSC, or IT sectors amounted to 103.56%. The result ratio which increased to the largest extent (by 174.76%) is a percentage of graduates covered by the EFS support who continued their education or took up employment within 6 months of completing the education.

Table 4. Result ratios [1].

The Name of the Ratio	Target Value	Value Reached Since the Beginning of the Project Implementation (Cumulatively)	Direct Result Ratio (%)
The number of persons who increased their competences as part of the university measures supported by the EFS	90	90	100
A percentage of graduates covered by the EFS support who continued their education or took up employment within 6 months of completing the education	50%	87.38%	174.76
The percentage of university graduates covered with the ESF support who within 6 months of completing their education took up employment with an employer operating in BPO, SSC or IT sector	30%	31.07%	103.56

[1] Source: own work based own data and analyses in progress.

Hypothesis two was therefore confirmed. Assessing the likelihood of maintaining positive results of the programme after completing its financing and the possibility of maintaining the effect of the projects on development processes in the longer run, it was proven that stability effects rose.

Summing up, success was achieved in this project regarded as part of the group of high-risk projects, i.e., the risk relating to achieving high product and direct result ratios as well as the employability ratio (assumed in 2014–2020). In particular, given the COVID-19 pandemic, a temporary lockdown of the Polish economy and the introduction of teleworking, we may presume that the fact that project participants achieved high levels of competence contributed to their employability.

4.3. RQ3: Which Competences Increasing Resilience to Crises (Induced by the COVID-19 Pandemic) Were Strengthened by Project Participants?

The next point is to consider which competences helped the participants face the crisis and played the key role in achieving success to the largest extent, despite unpredictable events linked to the COVID-19 pandemic.

The first step is to present results of the competence study for project participants in the logistics programme (see Table 5).

Table 5. Results of the competence study for project participants in the logistics programme [1].

The Name of the Competence	Arithmetic Mean in the Opening Study	Arithmetic Mean in the Closing Study	Progress in Logistics Students' Competences
Vocational (VC)	2.45	4.3	176%
Linguistic (LC)	2.35	4	170%
Communicative (CC)	2.6	4.5	173%
Analytical (AC)	2.25	4.25	189%
Digital (DC)	2.05	4.1	200%

[1] Source: own work based on competence studies [48].

The results of empirical studies proved that, in the MBS sector, key competences of logistic students cover IT, digital (Σ 200%), analytical competences, including problem-solving skills (Σ 189%) and vocational competences, including professional skills (Σ 176%), representing the level of specialist knowledge which illustrates the total increase in competences (Table 5).

The next step presents a competence framework and average in the study of logistics students' competences (see Table 6).

Table 6. A competence framework and average in the study of logistics students' competences. Source: own work [47].

Vocational Competences	The Opening Study	The Closing Study	Average
VC 1	1.9	3.7	2.8
VC 2	2.4	3.8	3.1
VC 3	2.7	4	3.35
VC 4	2.3	3.9	3.1
VC 5	2.3	3.8	3.05
VC 6	2.4	3.6	3
VC 7	2.4	3.7	3.05
VC 8	3	4.1	3.55
VC 9	2.9	4.1	3.5
VC 10	3.1	4.3	3.7
VC 11	3	3.9	3.3
VC 12	2.4	3.8	3.1
VC 13	2.4	3.7	3.05
VC 14	2.2	3.8	3
VC 15	2.8	3.6	3.2
VC 16	2.3	4	3.15
VC 17	2.8	3.9	3.35
VC 18	2.5	4	3.25
VC 19	2.6	3.9	3.25
VC 20	2.1	4	3.05
VC 21	2.2	3.6	2.9
VC 22	2.5	3.7	3.1
VC 23	2.3	3.9	3.1
VC 24	3.4	4.5	3.95
VC 25	3.5	4.8	4.15
VC 26	3.7	4.7	4.2
VC 27	3.8	4.8	4.3
VC 28	3.8	4.4	4.1
VC 29	3.3	4.3	3.8
VC 30	2.4	3.9	3.15

Digital Competences	The Opening Study	The Closing Study	Average
DC 1	2	3.6	2.8
DC 2	2.8	4	3.4
DC 3	1.8	3.6	2.7
DC 4	2.8	4	3.4
DC 5	2.2	3.8	3
DC 6	1.6	3.7	2.65
DC 7	2.5	4	3.25
DC 8	2.3	3.8	3.05

Analytical Competences	The Opening Study	The Closing Study	Average
AC 1	2.8	3.8	3.3
AC 2	1.7	3.5	2.6
AC 3	1.5	3.5	2.5
AC 4	1.7	3.8	2.75
AC 5	2.4	4.1	3.25
AC 6	3.7	4.4	4.05
AC 7	2.4	4	3.2
AC 8	2.6	4.1	3.35
AC 9	2.3	3.8	3.05
AC 10	3.5	4.2	3.85
AC 11	2.8	4.2	3.5

Communicative Competences	The Opening Study	The Closing Study	Average
CC 1	2.8	4.1	3.45
CC 2	2.9	4.3	3.6
CC 3	2.3	4.1	3.2
CC 4	2.9	4.4	3.65
CC 5	2.8	4	3.4
CC 6	2.4	4.1	3.25
CC 7	3.3	4.5	3.9
CC 8	3.4	4.5	3.95
CC 9	3.4	4.5	3.95

Linguistic Competences	The Opening Study	The Closing Study	Average
LC 1	3	3.9	3.45
LC 2	2.7	3.7	3.2
LC 3	2.5	3.6	3.05
LC 4	2.4	3.5	2.95
LC 5	2.2	3.6	2.9

The third step is to present of the competence study for project participants in the management programme (see Table 7).

Table 7. Results of the competence study for project participants in the management programme [1].

The Name of the Competence	Arithmetic Mean in the Opening Study	Arithmetic Mean in the Closing Study	Progress in Management Students' Competences
Vocational (VC)	2.25	4.3	191%
Linguistic (LC)	1.85	3.85	208%
Communicative (CC)	2.5	4.4	176%
Analytical (AC)	2.3	4.35	189%
Digital (DC)	1.9	4.2	221%

[1] Source: own work based on competence studies [48].

The results of empirical studies proved that, in the MBS sector, key competences of management students cover IT, digital (Σ 221%), linguistic competences, including English skills (Σ 208%), and vocational competences, including professional skills (Σ 191%), the level of specialist knowledge which illustrates the total increase in competences (Table 7).

The next step presents a competence framework and average in the study of management students' competences (Table 8).

The study showed that out of 63 competences of logistics, 39 key competences were selected as crucial for building resilience and, additionally, 5 sensitive competences which are very important or necessary in the modern business sector out of 62 competences of management, 35 key competences were selected and additionally, 6 sensitive competences for MBS (see Figures 2–4).

The summary detailed results are presented in Figure 3—key competences increasing resilience to crises (in the mechanism of adjusting management students' competence to needs of MBS).

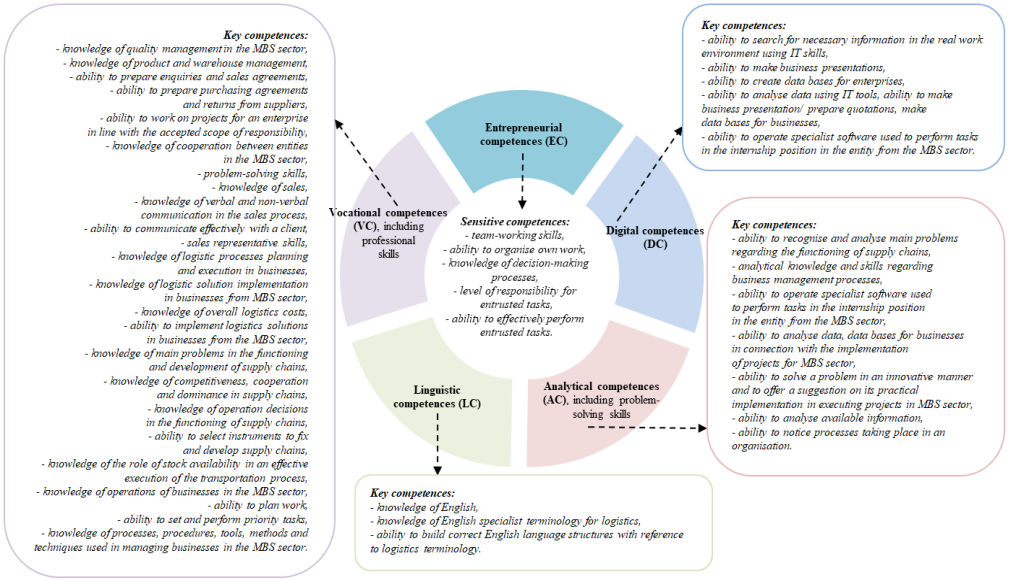

Figure 2. Competences increasing resilience to crises (in the mechanism of adjusting logistics students' competence to needs of the MBS). Source: own work.

The detailed results summary is presented in Figure 4—key competences increasing resilience to crises (in the mechanism of adjusting management students' competence to needs of MBS).

Detailed findings from our research have also proven that project participants strengthened their sensitive competences of logistics and management in the modern services sector, as presented in Figure 4 (these are very important (above 4) or necessary (up to 5) and

they affect the correct operations of entities in the MBS). Sensitive competences are 'soft' competences which are the most highly demanded ones.

The assessment of the project in terms of its efficiency confirmed that in the project "Competences of tomorrow's employees in the business services sector" we saw an increase in all analysed students' competences in line with the objective of Priority Axis 3.

Table 8. A competence framework and average in the study of management students' competences. Source: own work [47].

Vocational Competences	The Opening Study	The Closing Study	Average
VC 1	2.2	4.2	3.2
VC 2	2.2	3.8	3
VC 3	1.9	3.8	2.85
VC 4	2	3.7	2.82
VC 5	2.9	4.6	3.75
VC 6	3.2	4.6	3.9
VC 7	3.3	4.4	3.85
VC 8	2.5	4.1	3.3
VC 9	1.8	4.1	2.95
VC 10	1.7	4.2	2.95
VC 11	2.5	4.4	4.7
VC 12	2	4.1	3.05
VC 13	1.2	3.6	2.4
VC 14	1.7	4.3	3
VC 15	2.4	4.3	3.35
VC 16	2.2	4.2	3.2
VC 17	2.2	4.3	3.25
VC 18	1.9	4.2	3.05
VC 19	1.9	4	2.95
VC 20	2.4	4.1	3.25
VC 21	2.3	4.1	3.2
VC 22	3.2	4.4	3.8
VC 23	2.2	4.4	3.3
VC 24	3.5	4.4	3.95
VC 25	3.5	4.7	4.1
VC 26	3.5	4.7	4.1
VC 27	3.7	4.6	4.15
VC 28	3.9	4.6	4.25
VC 29	3.3	4.6	3.95
VC 30	2.4	4.1	3.25

Linguistic Competences	The Opening Study	The Closing Study	Average
LC 1	2.5	3.9	3.2
LC 2	1.8	3.8	2.8
LC 3	1.7	3.8	2.75
LC 4	1.6	3.8	2.7
LC 5	2	3.9	2.95

Digital Competences	The Opening Study	The Closing Study	Average
DC 1	2	4.2	3.1
DC 2	1.9	4.1	3
DC 3	1.8	4	2.9
DC 4	1.6	3.9	2.75
DC 5	2.2	4.4	3.3
DC 6	2.4	4.3	3.35
DC 7	2.2	4.1	3.15

Analytical Competences	The Opening Study	The Closing Study	Average
AC 1	2.2	4.2	3.2
AC 2	2.5	4.4	3.45
AC 3	2.4	4.3	3.35
AC 4	2.3	4.3	3.3
AC 5	2.3	4.3	3.3
AC 6	3.7	4.4	4.05
AC 7	2.4	4.5	3.45
AC 8	2.2	4.1	3.15
AC 9	2.5	4	3.25
AC 10	3.3	4.3	3.8
AC 11	2.6	4.3	3.45

Communicative Competences	The Opening Study	The closing Study	Average
CC 1	3	4.4	3.7
CC 2	3	4.4	3.7
CC 3	2	3.9	2.95
CC 4	3	4.6	3.8
CC 5	2.6	4.3	3.45
CC 6	2.8	4.3	3.55
CC 7	3.4	4.5	3.95
CC 8	3.2	4.4	3.8
CC 9	3.3	4.4	3.85

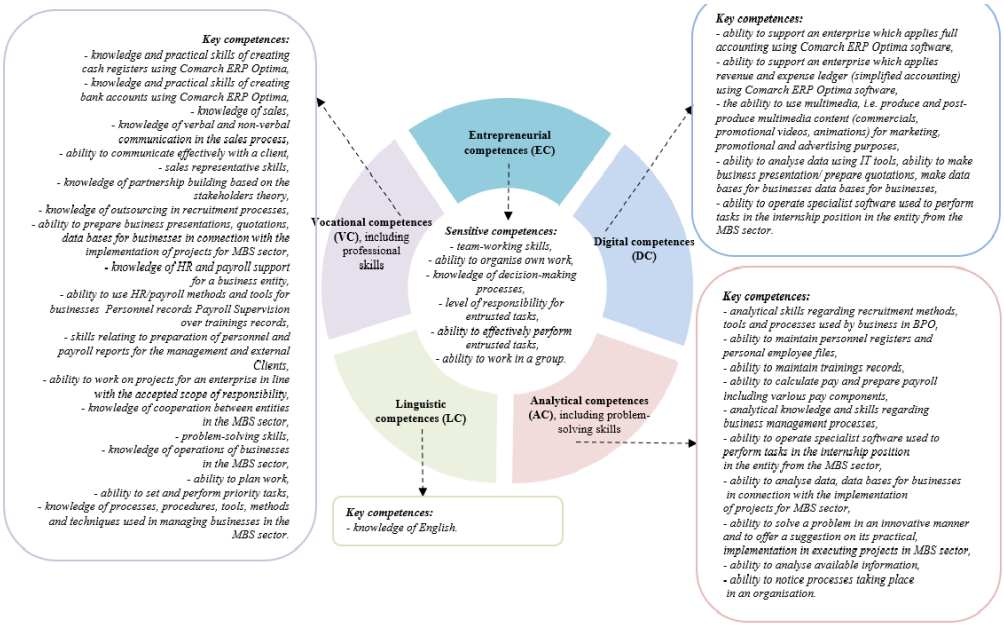

Figure 3. Competences increasing resilience to crises (in the mechanism of adjusting management students' competence to needs of MBS). Source: own work.

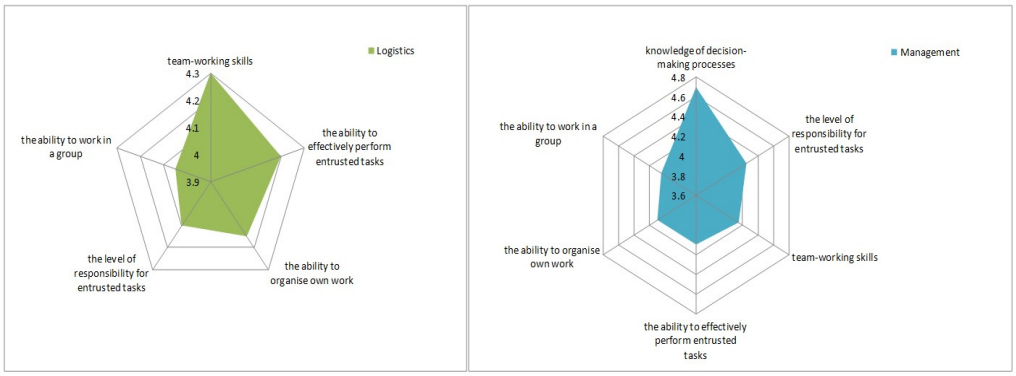

Figure 4. Sensitive competences of logistics and management project participants. Source: own work [47].

5. Discussion

The COVID-19 pandemic demonstrated how important it is for managers to reconsider the organisation's strengths and weaknesses so that new knowledge structures and capacities can be developed. According to Bratianu and Bejinaru, the knowledge strategies should be created by considering both internal and external business environments and they should also analyse the external environment to identify new opportunities and threats, especially during crisis times [7]. Managers should be focused on the opportunity space that is defined as "the combination of the business model, the organization's ability to execute upon it, and the detailed structure and process of the external environment" [6,7]. It is said that "managerial competences have developed into the sub-field of dynamic managerial capabilities, of which designing and implementing new business models is an important feature" [20,49].

On the basis of competencies management, various competency scholars, such as Ordóñez de Pablos and Lytras, suggested that there is also an identified need to outline the methods and technologies for integrated knowledge and learning and competency management support in organisations [50]. Carlucci, Mar and Schiuma reflections allow linking knowledge management with core competencies, strategic processes, business performance,

and finally, with value creation [51]. To properly comprehend the dynamism of knowledge creation in organisations, Nonaka and Nishiguchi (2001) proposed a model detailing the elements of knowledge creation. Knowledge is created through the interaction of these elements [52]. In the COVID-19 era, however, the knowledge strategy can be designed by considering all processes of knowledge: creation, acquisition, sharing, transformation, transfer, and knowledge use, within the framework of the organisation's knowledge management [7]. Mousavizadeh, Harden, Ryan, and Windsor stated that effective, consistent creation, and application of knowledge in an organisation is crucial to the success of such organisation [53]. However, knowledge management is built around interactions of various entities that results in social knowledge. Moreover, social knowledge as the aggregate of what people and systems know, is known to affect the creation of knowledge in an organisation. Thus, Fakhar Manesh et al. [54] suggested that the knowledge management approach in the Fourth Industrial Revolution should depend on the strategic orientation of the organisation.

The findings of the study prove that the role of projects depends on the knowledge management and the university maturity in the resilience context and it has a long-term strategic vision to develop competences, whereas the key benefit resulting from the implementation of projects co-financed under Axis 3 of the OP KED was increasing university appeal and its ability to attract the best students [45]. Moreover, trends in the labour market, changes, and unexpected events (such as the COVID-19 pandemic in 2020) constitute an important horizontal factor affecting decisions regarding the shape of future interventions of the European Union in the area of educational policy.

The Siedlce University project contributed to obtaining objectives of Priority Axis 3 of the OP KED by increasing key competences of persons participating in education at the university level which meet the needs of the economy, the labour market, and society, including the MBS. In this project, the following support effects and knowledge management benefits were observed: (1) For the university: development of collaboration with the socio-economic environment—extending the circle of employers the university collaborates with; employers view favourably measures taken by the university, they are engaged in consulting educational programmes, the analysis of company needs regarding educational effects in the study programmes; new prospects for collaboration emerge, also on the initiative of employers, knowledge and experience are exchanged; university image is improved—the university may boast a relatively strong and stable position (it is one of the largest employers in the local market); economic support for the university—regarding research and didactic collaboration. (2) For students: networking and increasing students'/graduates' employability; gaining knowledge that is documented with training/workshop/practical task certificates; strengthening key competences, including the entrepreneurial ones, expected by employers in the service market which offer higher resilience to crises. (3) For social and economic development: sustainable local and regional development in the MSB sector. As it was noted in the report on evaluation studies of the NCRD, the key question in the context of the assessment of the role of projects in a university is the analysis of whether the projects comply with a long-term vision of the university functioning resulting from real university needs and whether they are an impulse for further activity after completing the project [45].

Bolisani and Bratianu [34] propose a new approach that clarifies how planned and emergent knowledge strategies allow companies to make projections into the uncertain and unpredictable future that dominates today's economy. We agree with Bratianu and Bejinaru (2020) [7] that understanding the new paradigm of identifying emerging knowledge strategies will help managers manage knowledge more efficiently and deal with the COVID-19 crisis and post-crisis times. However, at this point, we should note that knowledge management and emerging knowledge strategies will be related with the competencies in specific sectors which can be called horizontal competencies, appropriate for particular industries within the economy (e.g., Economy 4.0). Based on our own research (Figure 5), we can claim that the key competences increasing resilience to crises in the modern business sector are:

digital, linguistic, vocational, analytical, as well as sensitive competences, entrepreneurial and soft skills.

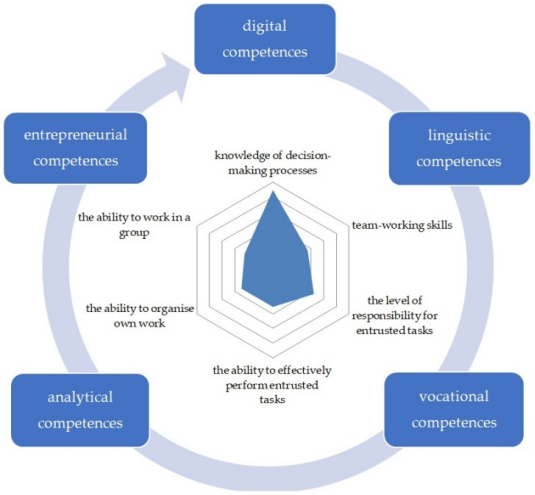

Figure 5. Competences increasing resilience to crises. Source: own elaboration.

According to Habiyaremye (2021) in the time of COVID-19, one of personal competencies was trust understood as the ability to trust others and as being trustworthy [55]. This is called soft competencies, which was examined to increase knowledge exchange and optimise resource utilisation and adopt production systems post COVID-19. This study "contributed to enhancing their mutual trust, which widened the opportunity to develop more flexible approach to their mutual transaction and created the platform for solidarity in the response to the impact of the crisis" [55]. The Portuguez Castro and Gómez Zermeño (2020) proposed study provides a literature review that focuses on identifying the resilience factors of entrepreneurs who confronted past crises to know how to apply them to overcome the difficult situation and contribute to post-COVID-19 entrepreneurship [11]. In the opinion of Salisu et al. (2020), resilience is seen as the entrepreneur's ability to adapt to change [13]. For Sawalha (2020), it becomes essential to address crises such as those caused by the global COVID-19 contingency [56]. Studies presented by Ayala and Manzano (2014) show that the resilience of entrepreneurs can be a factor of business success because resilient entrepreneurs demonstrate a high degree of tolerance to ambiguity, can adapt to change quickly, take advantage of those situations, and learn from their mistakes [14,40].

6. Conclusions

Summing up the considerations regarding support effects for personal development for the modern business services sector through building increased resilience to crises, it should be stressed that the National Centre for Research and Development has contributed to the support. Under the EU 2014–2020 intervention, the project "Competences of tomorrow's employees in the business services sector" was completed successfully at Siedlce University of Natural Sciences and Humanities. Based on the project's outcomes, the objectives were achieved, and we were able to provide answers to all our research questions. The success ratios were achieved, too; with product and direct result ratios and employability ratios occasionally exceeding the intended increase. The higher the key ratio, the stronger the support effects for project participants and the stronger their resilience developed as part of competency development.

Based on the assessment of the level and type of competences obtained, it may be concluded that the project's participants' employability was satisfying because the competences they obtained turned out to be crucial for the job search process in the time of crises. The project participants strengthened their key competences, including the en-

trepreneurial ones, and increased their resilience to crises (including the crisis induced by the COVID-19 pandemic).

Looking again at the research question, the following conclusions can be drawn.

1. The first research question aimed to identify product indicators that increase the effects of support for project participants. This research question made it possible to assess the effects of support for project participants in terms of the relevance assessment criterion. The target product indicators assumed in the project were achieved in at least 100% in terms of: the number of people who completed internship programmes, the number of study visits to employers and the number of projects developed as part of project tasks. In the case of indicators such as the number of persons covered by ESF support and adjusted to the needs of the economy, labour market and society, and the number of persons covered by training and counselling in digital competences, or the number of persons covered by ESF support within general academic or practical education programmes and adjusted to the needs of the economy, labour market and society, the beneficiary exceeded the project assumptions by 103%. There was also an increase (by 105.4%) in the product indicator concerning the total number of classes carried out (training/workshops, practical tasks in cooperation with entrepreneurs, and study visits) by employers. The greatest increase was recorded in the output indicator concerning the number of hours carried out in apprenticeships (by 151.5%). This is related to the fact that after 120 h of apprenticeships (in the first edition of the project) carried out in enterprises from the business services sector, employers who were party to apprenticeship contracts expressed the need to extend the duration of apprenticeships for project participants to 340 h (in the second edition).
2. The second research question was aimed at identifying direct result indicators influencing the increase in support effects for project participants. This research question made it possible to assess the effects of support for project participants in terms of the criterion of stability. Based on the results obtained, it can be seen that the project objective was achieved in 100%, as the number of people who increased their competences within the activities of ESF-supported higher education institutions was 90. The percentage of ESF-supported higher education graduates who took up employment with an employer operating in the BPO, SSC, or IT sector within 6 months of graduation was 103.56%. The result indicator that increased the most (by 174.76%) was the percentage of graduates covered by ESF support who continued their education or took up employment within 6 months of graduation.
3. The third research question sought to identify competences that increase resilience to crises. Two approaches to answering this question can be distinguished: key competences and sensitive competences:
    (a) Empirical findings have shown that in the MBS sector: Logistics students' key competences include digital, digital competences (Σ 200%), analytical competences including problem-solving skills (Σ 189%) and professional competences including professional skills (Σ 176%)—representing a level of expertise that illustrates the total increase in competences.
    (b) The results of the empirical research have shown that in the MBS sector: Management students' key competences include digital, IT competences (Σ 221%), language competences including English language skills (Σ 208%), and professional competences including vocational skills (Σ 191%)—representing a level of expertise that illustrates the total increase in competences.
    (c) The results of the empirical research proved the existence of a group of sensitive competences in the MBS sector (in the opinion of logistics and management students), which included: knowledge of decision-making processes, ability to work in a team, responsibility for assigned tasks, ability to perform assigned tasks effectively, and ability to organise own work.

The above-mentioned competences [38] are referred to as entrepreneurial competences according to the new Council Recommendation of 22 May 2018 on key competences for

lifelong learning, Official Journal of the EU 2018/C/189/01. These competences increasing resilience to crises are shown in Figure 5. They are very important and necessary in the mechanism of adjusting students' competence to the needs of the modern business services sector (in the context of sustainable spatial development and space polarisation [47].

Managing competences in the Triple Helix model takes place at the community level (the structural policy of the EU), at the national level (the system of higher education), at the organisational level (demand for competences for given sectors/developing competences in a flexible manner so as to match the needs), but also on the individual level of an employee who should ensure continuous development [47]. At this point, it should be noted that the competencies for the sector can be called horizontal competencies, appropriate for other branches of the economy (in particular, those referred to as Economy 4.0). These competences are sense-making, social intelligence, adaptive thinking, trans-cultural competency, cultural awareness expression, new-media literacy, computational thinking, transdisciplinarity, virtual collaboration, design mindset, emotional intelligence, cognitive load management, variability, broad contextuality, self-reflection, environmental performance, equality competences, and educability [10].

The conclusions of the study allowed us to make recommendations regarding the emergent knowledge strategies about the European Union's future agenda as well as about knowledge management and university training programs for resilient skills.

Implementation of the objectives of Priority Axis 3 of the OP KED leads to several conclusions regarding the emerging knowledge strategy (in the area of higher education policy):

1. The need for strengthening the role of the university in shaping and increasing students' competences necessary for building communities resilient to crises;
2. External university stakeholders recognise the advantages of collaboration with higher education institutions, they are interested in collaboration and see the area for cooperation, which will contribute to building the ecosystem supporting mutual measures if any unexpected events occur;
3. In the process of modelling competences (the key ones, including the entrepreneurial competence) the systemic and knowledge management measures required by employers should be used;
4. Information campaigns should be run among students to raise their awareness of the need for shaping competences which are crucial in the recruitment process by employers and strengthen their competitive advantage in a volatile market;
5. Projects implemented together with stakeholders contribute to the sustainable development of regions, local markets, and business sectors;
6. Need for increasing attractiveness of training in the area of competences resilient to crises and increasing the length of apprentice schemes, especially in those areas where there is a competence gap regarding the needs of the labour market;
7. The shape of the emerging knowledge strategy should be developed within a wide circle of stakeholders involved in knowledge management and project management and it should take into account the needs, but also the absorption capacities of the labour market and tools for levelling off adverse effects of crises.

As our research was limited and based on a small data set, the issue should be further investigated. Therefore, researchers are encouraged to also use other sets of competences as a basis for future research in different sectors and on a longer-term perspective, which can lead to substantial implications for educational practice. Such sets can include, for example, entrepreneurship competencies in energy sustainability [57], small businesses [58–60] and Industry 4.0, [61], urban areas [62–64] or entrepreneurial resilience [65], management cycle [56], human resource management [66], entrepreneurial being or behaviour [67], and corporate sustainability and society [68].

To keep up with the current pace of change resulting from digitisation and the post-COVID-19 crisis, we need to acquire new skills and change our way of thinking [69], because an open approach to the learning process is necessary in the context of preparing young people to perform in a world where uncertainty and constant changing conditions

are the norm. Bratianu (2022), on the basis of the critical review of the literature, identified "four main dimensions of the new normal: uncertainty, complexity, learning and unlearning, and resilience" [33].

In the new EU financial perspective, ensuring the stability of entire business sectors, including the higher education community will pose a considerable challenge in the time of crises. The ESCO is the European multilingual classification of European Skills, Competences, Qualifications, and Occupations. ESCO as a tool supports two key EU strategies in this field: Europe 2020 and the Skills Agenda for Europe [70]. The European Skills Agenda sets targets to be achieved by 2025 (see Agenda for New Skills and Jobs, Europe 2020 [71]), based on well-defined quantitative indicators. The European Skills Agenda is a five-year plan to help individuals and businesses develop more and better skills and use them, by [72]: strengthening sustainable competitiveness, in line with the European Green Deal, ensuring social justice, implementing the first principle of the European Pillar of Social Rights: access to education, training and lifelong learning for everyone, everywhere in the EU, building resilience to respond to crises, and building on the lessons learned during the COVID-19 pandemic. Taking into account the conclusions of this article based on empirical research can contribute to the objectives of the EU documents.

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