

CREATIVITY AS A COMPONENT OF FUTURE MANAGERS' RESILIENCE

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Purpose: This paper aims to present creativity as a key component of the resilience of future managers and to identify the factors that foster the development of these competencies at the academic stage. In the era of increasing uncertainty and complexity of the business environment, creativity becomes not only a source of innovative solutions but also a resource that supports individuals' adaptability and resilience to change and pressure.

Design/methodology/approach: The study aimed to assess the level of creativity among Management students at the Faculty of Management, Lublin University of Technology, and to determine the extent to which the development of creativity during studies may support building organizational resilience in their future managerial roles. A diagnostic survey method was applied using the auditorium questionnaire technique. The measurement tool was an original creative thinking questionnaire designed to capture dimensions such as fluency, flexibility, originality, abstractness, elaboration, and resistance to premature closure. The research involved 75 undergraduate Management students (years 1-3).

Findings: The analysis indicates that senior-year students tend to demonstrate higher levels of creativity. This suggests that an academic environment fostering diverse educational experiences and collaboration creates opportunities for developing both creative competencies and adaptive capacities.

Practical implications: The results may serve as a guideline for designing educational programs aimed at strengthening students' creative competencies and adaptive abilities. Universities and organizations should consciously create environments that foster creative thinking, collaboration, and experimentation.

Social implications: Fostering creativity among students can enhance their ability to adapt to uncertain situations and strengthen their resilience. Education focused on developing these competencies has a potentially important role in building the psychological and emotional resilience of young people, preparing them for more conscious and flexible functioning in changing social and economic conditions.

Originality/value: The article introduces a novel perspective by integrating the concepts of creativity and resilience within the context of management education. Its value lies in the empirical demonstration of the links between these constructs and in providing practical recommendations for educators, policymakers, and HR professionals interested in human capital development.

Keywords: creativity, resilience, human resources.

Category of the paper: Research paper.

1. Introduction

Contemporary organizations operate within conditions characterized by continuous disruptions, escalating complexity, and unpredictable transformations. The environment commonly referred to by the acronym VUCA - denoting volatility, uncertainty, complexity, and ambiguity - demands from both individuals and organizational structures not merely operational flexibility, but also the capacity for rapid learning, strategic redefinition, and the adaptive utilization of human resource potential (Barasa et al., 2017; Mieszajkina, Ostapińska, 2024).

Within this framework, particular significance is ascribed to the notion of human resource resilience, which may be defined as a constellation of attributes, competencies, and mechanisms enabling employees - at both the individual and collective level - to sustain effective functioning under conditions of pressure and destabilization (Kantur, Iseri-Say, 2015; Duchek, 2020). Resilience should not be understood merely as the ability to return to a pre-crisis equilibrium; rather, it extends to encompass processes of learning, adaptation, and transformation. Its multidimensional character comprises psychological, relational, procedural, and strategic components, which jointly constitute the foundation of organizational sustainability and long-term development (Lengnick-Hall et al., 2011; Sutcliffe, Vogus, 2003).

Among the factors reinforcing resilience, creativity occupies a particularly prominent position, understood as the capacity to generate original and useful solutions. It supports both adaptation to change and the proactive response to uncertain situations (Amabile, Pratt, 2016). Creative thinking is closely associated with cognitive flexibility, emotional resilience, and the capacity to transform challenging experiences into opportunities for development (Runco, Jaeger, 2012; Zawadi, 2024).

Although the topics of creativity and resilience are gaining increasing attention in the academic literature, the relationship between these constructs remains insufficiently explored, particularly in the context of future leaders - students of management programs. Their creative competencies, approach to uncertainty, and ability to perform under pressure constitute important indicators of the potential for the next generation of executives. This article attempts to address issues such as the extent to which the level of creativity among management students influences their capacity to cope with stressful and uncertain situations, which characteristics of creative thinking support individual resilience, and the degree to which extracurricular activities contribute to the development of creative and adaptive competencies.

The authors' primary intention was to present creativity as a crucial element of psychological and adaptive resilience, particularly in the context of developing competencies among future managers. The presented research aims to assess the level of creativity among Management students at the Faculty of Management, Lublin University of Technology, and to determine the extent to which fostering creativity during their studies can support the

development of organizational resilience in their future managerial roles. The analysis is based both on a review of the scientific literature in this area and on the empirical findings obtained from research conducted among Management students at Lublin University of Technology.

The research approach adopted in this study was triangulatory, integrating both quantitative and qualitative methods. This approach enabled a more comprehensive examination of the relationships between creativity and resilience, as well as the identification of educational and environmental factors that promote their enhancement. The results obtained not only confirmed the interdependence of the constructs under investigation but also revealed specific mechanisms and forms of activity that facilitate the development of resilience through the cultivation of creative potential.

2. Human resource resilience in organizations

The concept of resilience has multidimensional roots and has evolved across various disciplines over the decades. The term first appeared in developmental psychology, referring to the capacity of children raised under adverse conditions to achieve relatively normal psychosocial development (Masten, 2001). In parallel, the concept of resilience emerged in ecology and the natural sciences, where it denoted the ability of natural systems to withstand disturbances and return to equilibrium (Holling, 1973). Both of these streams - the psychological and the systemic - were later applied in the fields of management and organizational studies (Lengnick-Hall et al., 2011). L.A. Mallak (1998), as one of the first, argued that organizational resilience should be understood as an active strategy that enables functioning despite uncertainty and disruption. On this basis, K.M. Sutcliffe and T.J. Vogus (2003) proposed a different perspective, shifting the emphasis from simply “bouncing back” after a difficult event to the ability of an organization to continue operating and maintain operational integrity despite the occurrence of a disruption - referred to as “bouncing forward”. Consequently, resilience began to be viewed as a process rather than a fixed trait. C.A. Lengnick-Hall et al. (2011) further developed this perspective, highlighting that organizational resilience encompasses the capacity to absorb shocks, adapt, and anticipate threats, shaped through managerial practices and interactions with the environment.

In Polish research, increasing emphasis is placed on the significance of human resource resilience, understood as the capacity of employees and teams to maintain operational effectiveness under conditions of destabilization. Authors indicate that the foundation of this resilience lies not only in individual competencies and motivation, but also in the quality of social relationships and organizational culture, which enable organizations not only to survive crises but also to actively mitigate their effects (Turek, 2020). From a psychological perspective, particular importance is attributed to traits such as cognitive flexibility, emotional

regulation, optimism, self-efficacy, and stress tolerance. These characteristics allow individuals to cope more effectively with pressure, adapt to changing conditions, and maintain engagement at work (Sikorska, 2017). The relational dimension, in turn, is associated with the quality of team interactions-trust, open communication, and collaboration foster collective resilience and enhance the sense of security (Sutcliffe, Vogus, 2003). Equally important is the procedural dimension, which encompasses contingency plans, early warning systems, and flexible decision-making mechanisms. While their mere existence is insufficient, proper implementation and employee familiarity with these systems significantly enhance the organization's ability to respond to sudden disruptions (Duchek, 2020). Finally, the strategic dimension concerns a long-term approach to uncertainty and change, relying on the capacity to identify threats, draw lessons from experience, and promote a culture of innovation and readiness for transformation (Lengnick-Hall et al., 2011).

Factors shaping human resource resilience operate at multiple levels. At the individual level, psychological capital, i.e., hope, optimism, a sense of agency, and mental resilience, plays a key role (Luthans et al., 2007). Creativity is also an important individual resource, facilitating flexible responses to change and the pursuit of innovative solutions (Amabile, Pratt, 2016). At the organizational level, resilience is primarily supported by leadership style - transformational leaders who inspire and support employee development help to foster a climate of trust and safety (Kraśńska, 2016). In addition, human resource management practices, including training, flexible forms of employment, and well-being programs, can mitigate the effects of crises and enhance the adaptive capacity of the organization (Stephen, Zafer, 2020). At the level of the external context, critical factors include economic crises, pandemics, and armed conflicts. Research indicates that organizations implementing flexible solutions and structures were better prepared to cope with uncertainty, thereby enabling the maintenance of operational continuity (Dębkowska et al., 2022).

Human resource resilience can be conceptualized as a process based on three stages: preparation, response, and learning (Duchek, 2020). The preparation stage involves developing adaptive competencies, gathering resources, and planning for disruption scenarios. The response stage entails the mobilization of actions and rapid decision-making in the face of a crisis, while simultaneously ensuring employee well-being (Dembek, 2016). The learning stage enables the transformation of experiences into new managerial practices and innovative solutions, thereby enhancing organizational adaptability (Antczak, 2014). Research also highlights the existence of so-called feedback loops: the socio-cognitive loop, which links well-being with creativity and engagement, and the competency loop, which allows organizations to develop HR practices based on previous experiences. In this way, resilience becomes a source not only of survival but also of productivity and innovation (Barasa et al., 2017).

The significance of this concept became particularly evident during the COVID-19 pandemic. Research conducted in Polish organizations demonstrated that companies investing in technological solutions, well-being programs, and flexible work arrangements achieved

higher performance and maintained team engagement under challenging conditions (Bieńkowska et al., 2025). These findings indicate that resilience is not based on procedures or technology alone, but on a culture of trust, autonomy, and open communication.

Measuring human resource resilience requires the use of diverse methods. At the individual level, psychological scales such as the CD-RISC (Connor, Davidson, 2003) or the RS-14 (Wagnild, Young, 1993) are most commonly employed, assessing persistence, sense of control, and self-discipline. At the organizational level, tools such as the BRAS (Kantur, Iseri-Say, 2015) are used to evaluate culture, leadership, and process flexibility. In Poland, attention is drawn to the necessity of local adaptation of these instruments and to the integration of quantitative and qualitative methods to capture cultural and relational contexts (Stanisławski, 2017).

In conclusion, human resource resilience constitutes a key element in building organizational advantage under conditions of uncertainty. It develops through the interplay between individual competencies, management style, and the influence of the external environment. The mechanisms underpinning resilience enable organizations not only to survive crises but also to learn and strengthen themselves, thereby enhancing their capacity for growth and innovation. Investments in people - their competencies, relationships, and well-being - thus become a strategic choice that determines the long-term competitiveness of the organization.

3. Managerial creativity as a component of human resource resilience

Managerial creativity is conceptualized in the literature as a complex competence that constitutes the foundation of innovative and resilient organizational functioning. T. Amabile (1983) defines it as the ability to generate solutions that are both original and useful within a specific organizational context, addressing the needs of the team, client, or market. Within the componential model of creativity, the author distinguishes three essential elements that condition the effectiveness of creative action: domain-relevant knowledge, creative thinking skills, and intrinsic motivation. It is intrinsic motivation - serving as a source of engagement independent of external stimuli - that represents the most enduring driver of innovativeness.

Polish researchers emphasize that the development of managerial creativity is not merely an individual trait but rather the outcome of an individual's interaction with organizational culture. M. Juchnowicz and H. Kinowska (2022) highlight that managerial creativity requires a work environment based on trust, partnership-based communication, and acceptance of mistakes, which strengthens rather than stifles creative potential. Similarly, P. Kowalczyk and M. Kamiński (2023) underscore the importance of psychological safety, a sense of influence, and autonomy of action as the foundations of creative functioning. B. Kożusznik (2002) further adds that an effective creative manager is not only capable of generating original ideas but also

of persuading the team, overcoming resistance to change, and creating conditions conducive to the development of creativity.

In the international literature, M.D. Mumford et al. (2002) argue that managerial creativity should be analyzed as a process encompassing the generation, structuring, and promotion of ideas, which enables their effective transformation into implementable and scalable solutions. Similarly, C.E. Shalley et al. (2015) emphasize that a key condition of creative leadership is openness to feedback, treated as a source of knowledge and a stimulus for development. Contemporary approaches also highlight the role of socio-emotional competencies. A. Drigas et al. (2023) indicate that managerial creativity stems not only from cognitive abilities but also from emotional intelligence, which supports flexibility and resilience in the face of challenges.

This is precisely where the direct link between creativity and organizational resilience becomes evident. In the context of globalization, digitalization, and increasing uncertainty, organizations and individuals must demonstrate not only innovativeness but also the ability to adapt and transform existing patterns of action. In the literature, resilience is defined as the capacity to respond swiftly to disruptions, to engage in continuous learning, and to regenerate under conditions of pressure and uncertainty (Lengnick-Hall et al., 2011; Sutcliffe, Vogus, 2003). Researchers increasingly emphasize that creativity - understood as a process involving thinking, emotions, and social interactions - is the foundation of resilience. It enables the generation of original and useful solutions as well as the redefinition of problems, which facilitates the adaptation of resources to changing conditions (Runco, Jaeger, 2012; Amabile, Pratt, 2016). Moreover, empirical evidence suggests that creative expression strengthens coping mechanisms in the face of adversity and stress, providing invaluable support in building the resilience of individuals and teams (Zawadi, 2024).

A review of the literature confirms that creativity fulfills both a preventive function - anticipating risks - and a regenerative function - supporting recovery after crises (De Lorenzo et al., 2023). This dual role implies that creativity not only mitigates the negative effects of pressure but also actively contributes to building adaptive and restorative capacity. In the context of contemporary social and technological transformations, creativity acquires a strategic dimension - not as a cognitive luxury, but as a necessary condition for functioning in an environment of discontinuity and change. When appropriately cultivated already at the educational stage, it can serve as a foundation for both individual and organizational resilience.

Human resource resilience encompasses not only the capacity for recovery after a crisis but also the ability to act proactively under conditions of uncertainty. Creativity, understood as a key cognitive component, enables the generation of original solutions, the flexible reorganization of available resources, and the reinterpretation of problem situations in line with changing conditions (Lengnick-Hall et al., 2011). In practice, this means that a creative approach supports continuous adaptation to disruptions without compromising operational coherence or reducing the quality of work.

At the international level, A. De Lorenzo et al. (2023) indicate that creativity in young people functions as a resource that strengthens psychological resilience, particularly in pandemic conditions. Research confirms that creativity enhances cognitive flexibility and the sense of agency, thereby supporting adaptive mechanisms in challenging circumstances. The role of education and HR systems should therefore be to foster creative thinking as a crucial mechanism that reinforces psychological resilience and the capacity for adaptation in a dynamic and uncertain world.

Although creativity has a strong individual component - related, among other things, to knowledge, internal motivation, and personality - its development and outcomes are conditioned by the environment. It is the interaction with the surrounding context that determines whether creativity is supported or constrained (Beghetto, Kaufman, 2007; Pufal-Struzik, 2017). Differences in the level of creativity among students are often associated with factors such as curriculum design, teaching methods, or the approach of academic staff. Institutions that promote active learning, dialogue, and experimentation are more effective in fostering creative competencies. Cultural education is also an important factor, as it develops divergent thinking and empathy by integrating art, philosophy and history into the teaching process (Lewartowicz, 2019). In turn, the behaviour of academic teachers, such as encouraging independence, asking open questions or using activating methods, has a direct impact on the level of creativity of students (Ciżkowicz, 2016).

In the academic environment, students' creativity also develops beyond the formal curriculum - through participation in projects, involvement in student organizations, or collaboration within interdisciplinary teams. These experiences foster not only the formation of a creative approach but also emotional resilience and cognitive flexibility, both of which are essential in professional contexts. A comparison between educational and organizational settings reveals significant differences in the mechanisms that strengthen creativity and resilience. While universities focus primarily on developing cognitive competencies, they often lack exposure to real failures and crises (Bugaj, Szarucki, 2018). In contrast, organizational environments - particularly those driven by innovation - foster resilience through the practice of operating under pressure, while simultaneously providing support in the form of mentoring, coaching, and spaces for experimentation (Ulatowska, 2019).

However, systemic and cultural barriers, such as rigid curricula, pressure to perform, and fear of assessment, which can stifle creative activities, remain significant. The Polish education system still has obstacles that hinder the development of creativity, including overly formalised curricula, a strong focus on performance assessment, and insufficient freedom to engage in creative experimentation and exploration (Szmids, 2017).

In organizations that foster innovation, leaders act as coordinators of creativity through openness, empathy, and the ability to recognize the potential of their teams. They create a culture of psychological safety that encourages cognitive risk-taking and strengthens both individual and collective resilience. Similar mechanisms are applied in higher education

institutions that implement modern teaching methods, such as project-based work, case studies, or simulations, which enhance students' creativity and adaptability (Fazlagić, 2022).

The literature increasingly emphasizes the dual nature of human resource resilience: preventive, encompassing the capacity to prepare for potential disruptions, and regenerative, referring to recovery after a crisis (Lengnick-Hall et al., 2011). Creativity plays a crucial role in both dimensions: in prevention, by generating action scenarios and exploring alternative solutions (van der Vegt et al., 2015), and in regeneration, by assigning new meaning to experiences and constructing constructive narratives of failures (Zawadi, 2024).

From a management practice perspective, creativity should not be regarded solely as a source of innovation but as a fundamental resilience resource. Organizations that consciously support creative attitudes, promote a culture of openness, and accept mistakes as part of the learning process achieve greater capacity for adaptation and for actively transforming reality in the face of uncertainty (Caza, Milton, 2012). Creative individuals are more flexible, proactive, and prepared for crises, which allows human resource resilience to acquire not only a reactive but also an anticipatory dimension.

4. Research methodology

For the purposes of the research, the following research question was formulated: How can creative abilities enhance the capacity of future managers to operate effectively in situations of uncertainty? The objective of the research was to assess the level of creativity among Management students at the Faculty of Management of the Lublin University of Technology and to determine the extent to which the development of creativity during their studies can support the building of organizational resilience in their future managerial roles. For the purposes of the research, resilience was evaluated based on fluency, flexibility, originality, abstractness, elaboration of responses, and resistance to premature closure. The following hypotheses were formulated:

- H1: Third-year students demonstrate higher levels of fluency and flexibility in their responses than younger years, which supports the development of adaptive skills essential for building organizational resilience in their future managerial roles.
- H2: Second-year students achieve higher scores in terms of originality and abstractness of responses compared to the other students, which enhances creative problem-solving abilities and contributes to organizational resilience.
- H3: Third-year students exhibit higher levels of elaboration in their responses and greater resistance to premature task closure than first-year students, supporting the development of competencies related to persistence and perseverance, which are crucial for organizational resilience.

The hypotheses were verified using a diagnostic survey method involving an auditorium questionnaire, i.e., a quantitative empirical research technique in which a questionnaire is distributed and completed by respondents gathered simultaneously in a single location. The survey was conducted on April 15, 2025, among first-, second-, and third-year students of the Faculty of Management at the Lublin University of Technology. Participants were given approximately 15 minutes to complete the questionnaires, and participation in the study was voluntary.

The research instrument consisted of three parts:

1. Demographic.
2. Self-assessment of creativity – 1 closed-ended question and 6 statements, rated on a 5-point Likert scale, where 1 corresponds to “strongly disagree” and 5 to “strongly agree”.
3. Open-ended tasks designed based on selected categories of creative thinking: fluency and flexibility, originality, abstractness, elaboration, and resistance to premature closure.

For the analysis of the open-ended tasks included in the research instrument, authorial evaluation criteria were developed, as presented in Table 1. The applied evaluation method is subjective and does not constitute a standardized psychometric test.

Table 1.
Scoring criteria in the research tool

Task No.	Creativity dimension measured	Evaluation criteria	Scoring scale
1.	Fluency	Number of different, unique ideas	1 pt: 1-2 ideas 2 pts: 3-5 ideas 3 pts: 5+ ideas
1.	Flexibility	Number of different thematic categories	1 pt: 1-2 categories 2 pts: 3-5 categories 3 pts: 5+ categories
2.	Originality	Frequency of occurrence of the idea in the sample (uniqueness)	1 pt: repetitive idea 2 pts: moderately original idea 3 pts: highly original idea
3.	Abstractness	Level of departure from existing schemes, use of metaphorical thinking	1 pt: literal ideas 2 pts: partially abstract ideas 3 pts: highly abstract ideas
4.	Elaboration	Number and quality of details, coherence, and development of the response	1 pt: superficial idea 2 pts: moderately developed idea 3 pts: well-developed idea
5.	Resistance to premature closure	Assessment of completeness, complexity, and originality of the response	1 pt: superficial ideas 2 pts: moderately developed ideas 3 pts: creatively well-developed ideas

Source: own elaboration.

Each participant could earn a maximum of 18 points, including 6 points for task 1 (3 points for fluency and 3 points for flexibility) and 3 points for each of tasks 2-5. The study involved 25 students from each year. Among the participants, there were 48 women and 27 men,

and 14 individuals reported active participation in a student scientific association - 7 from the first year, 3 from the second year, and 4 from the third year.

5. Analysis of research results

At the outset, students assessed their own creativity on a scale of 1 to 5, where 1 indicated "very low" and 5 indicated "very high". The average self-assessment of creativity among first-year students was 3.24 points, among second-year students 3.76 points, and among third-year students 3.8 points.

Students, regardless of their year of study, generally perceive themselves as relatively creative. The lowest self-assessment was observed among first-year students (3.24 points), while higher values were recorded for second-year (3.76 points) and third-year students (3.8 points), indicating a growing confidence in their creative competencies.

To verify H1, the first open-ended task was divided into two dimensions of creativity: fluency (Table 2) and flexibility (Table 3). Initially, students were asked to list ways of saving money in everyday life (Table 2). The results of members of the student scientific association are indicated in the table as SSA.

Table 2.
Students' fluency scores

Year of Study	Points from Table 1			Weighted mean (μ)		Standard deviation (σ)	
	1	2	3	Entire sample	SSA	Entire sample	SSA
1	17	8	0	1.32	1.43	0.48	0.495
2	2	12	11	2.36	2.67	0.64	0.47
3	5	12	8	2.12	2.75	0.73	0.43

Source: own elaboration.

First-year students scored between 1 and 2 points, indicating low to moderate fluency of responses ($\mu = 1.32$; $\sigma = 0.48$). The responses of student scientific association (SSA) members did not differ significantly ($\mu = 1.43$; $\sigma = 0.495$), suggesting that this activity had no noticeable effect on fluency within this group. Second-year students showed more varied results than the younger students ($\mu = 2.36$; $\sigma = 0.64$). Most students scored 2 or 3 points, indicating moderate to good fluency, with only two responses scoring lower. SSA members achieved higher scores ($\mu = 2.67$; $\sigma = 0.47$). Third-year undergraduate students displayed fairly diverse fluency scores ($\mu = 2.12$; $\sigma = 0.73$). Membership in a scientific association correlated with higher fluency, as third-year students participating in SSAs scored 2–3 points ($\mu = 2.75$; $\sigma = 0.43$).

Table 3.*Flexibility of students' responses*

Year of Study	Points from Table 1			Weighted mean (μ)		Standard deviation (σ)	
	1	2	3	Entire sample	SSA	Entire sample	SSA
1	19	6	0	1.24	1.29	0.43	0.45
2	8	16	1	1.72	2.00	0.53	0.82
3	10	11	4	1.76	2.00	0.71	0.71

Source: own elaboration.

The results for flexibility among first-year students are relatively homogeneous, as both student scientific association members ($\mu = 1.29$; $\sigma = 0.45$) and other students ($\mu = 1.24$; $\sigma = 0.43$) most frequently scored 1 point, indicating low flexibility in their responses. Among second-year students, scores of 1 and 2 points predominated, reflecting moderate flexibility ($\mu = 1.72$; $\sigma = 0.53$). Second-year students who were SSA members showed the most varied results, as indicated by a high standard deviation of 0.82. Third-year students displayed the most diverse flexibility scores among the analyzed years ($\mu = 1.76$; $\sigma = 0.71$). SSA members in the third year showed similarly varied results compared to other students in the final year of the undergraduate program ($\mu = 2.00$; $\sigma = 0.71$).

As shown in Tables 3 and 4, in the first open-ended task assessing the levels of fluency and flexibility, third-year students achieved higher scores than the other students, confirming the assumptions of H1.

The verification of H2 was conducted by measuring the next two dimensions of creativity - originality (Table 4) and abstractness (Table 5). Points for originality were assigned based on the rarity and innovativeness of responses, on a scale from 1 to 3. The most common ideas in this task included: promotions, work, savings accounts, and forgoing a particular product or service.

Table 4.*Originality of students' responses*

Year of Study	Points from Table 1			Weighted mean (μ)		Standard deviation (σ)	
	1	2	3	Entire sample	SSA	Entire sample	SSA
1	15	6	0	1.29	1.57	0.45	0.50
2	4	18	3	1.96	2.33	0.53	0.47
3	1	16	8	2.28	2.25	0.53	0.43

Source: own elaboration.

Among first-year students, the results are fairly uniform ($\mu = 1.29$; $\sigma = 0.45$), with scores of 1 point, indicating low originality, and 2 points predominating. Student scientific association (SSA) members did not differ significantly from the other students ($\mu = 1.57$; $\sigma = 0.50$), which may suggest that association membership does not enhance originality in ideas. Second-year students achieved more varied results, with 2 points being the most frequently awarded score ($\mu = 1.96$; $\sigma = 0.53$). Third-year students exhibited the highest level of originality ($\mu = 2.28$; $\sigma = 0.53$). Comparing the three years, the level of originality increases with the year of study, and SSC members often achieve higher scores than their peers.

For the measurement of abstractness, students were asked to draw a desk of the future. The scoring scale was identical to the previous task, ranging from 1 to 3, where 3 indicated the most unconventional, futuristic approach.

Table 5.

Abstractness of students' responses

Year of Study	Points from Table 1			Weighted mean (μ)		Standard deviation (σ)	
	1	2	3	Entire sample	SSA	Entire sample	SSA
1	8	15	2	1.76	2.29	0.59	0.45
2	6	12	7	2.04	1.33	0.72	0.47
3	4	11	10	2.24	2.50	0.71	0.50

Source: own elaboration.

First-year students exhibited a moderate level of abstractness, most frequently scoring 2 points ($\mu = 1.79$; $\sigma = 0.59$). SSA members achieved slightly higher scores ($\mu = 2.29$; $\sigma = 0.45$). A wide range of results was observed among second-year students ($\mu = 2.29$; $\sigma = 0.45$), which may indicate a developing level of abstract thinking. Third-year students achieved the highest scores among all years ($\mu = 2.04$; $\sigma = 0.72$), reflecting a high level of abstractness and the ability to create visions beyond realistic frameworks. Third-year students demonstrate the greatest potential for generating conceptual and visionary solutions, which may result from the accumulated experience and enhanced projective imagination they have developed throughout their studies. However, the analysis of the obtained results does not allow for H2 confirmation of H2.

To verify H3, the last two dimensions of creativity were measured - elaboration (Table 6) and resistance to premature task closure (Table 7). The elaboration measurement required students to demonstrate the ability to expand and thoroughly describe ideas, including the number and quality of details in their descriptions.

Table 6.

Elaboration of students' responses

Year of Study	Points from Table 1			Weighted mean (μ)		Standard deviation (σ)	
	1	2	3	Entire sample	SSA	Entire sample	SSA
1	8	11	6	1.92	1.86	0.74	0.64
2	2	9	14	2.48	2.33	0.64	0.47
3	1	8	16	2.6	3.00	0.57	0.00

Source: own elaboration.

The results of first-year students were varied, which may indicate that the ability to develop ideas is not yet fully formed for many individuals at this stage of study ($\mu = 1.92$; $\sigma = 0.74$). First-year SSA members did not stand out compared to the rest of the year ($\mu = 1.86$; $\sigma = 0.64$). Among second-year students, high scores predominated, indicating a well-developed ability to construct coherent and descriptive responses ($\mu = 2.48$; $\sigma = 0.64$). Third-year students achieved the highest and most stable scores ($\mu = 2.6$; $\sigma = 0.57$). SSC members in the final year of the undergraduate program were among the highest scorers ($\mu = 3.00$; $\sigma = 0.00$). In the final part of the study, perseverance, motivation, and willingness to further develop ideas were assessed.

The scoring scale ranged from 1 to 3 points, where 3 indicated a complete and well-considered completion of the task, and 1 indicated superficial and incomplete responses.

Table 7.

Resistance to premature task termination among students

Year of Study	Points from Table 1			Weighted mean (μ)		Standard deviation (σ)	
	1	2	3	Entire sample	SSA	Entire sample	SSA
1	5	16	4	1.96	2.14	0.60	0.64
2	5	16	4	1.96	1.33	0.60	0.47
3	3	13	9	2.24	2.75	0.65	0.43

Source: own elaboration.

First-year students achieved the same results as second-year students ($\mu = 1.96$; $\sigma = 0.60$), which may indicate a still low, developing level of perseverance. The scores of second-year SSC members were even lower compared to their peers ($\mu = 1.33$; $\sigma = 0.47$). Third-year students achieved the highest scores ($\mu = 2.24$; $\sigma = 0.65$). Extracurricular activity among final-year undergraduate students may foster greater engagement, discipline, and motivation, as evidenced by the results of SSA members ($\mu = 2.75$; $\sigma = 0.43$). The development of the traits assessed in this task may occur over time and with academic experience, as confirmed by the higher scores of third-year students. Analysis of the data presented in Tables 6 and 7 allowed for the confirmation of H3.

6. Conclusions and discussion

The analysis of the results obtained during the study confirmed the existence of a relationship between students' levels of creativity and their cognitive-emotional resilience. The findings also highlight the significant role of extracurricular activities in shaping these competencies. At the same time, it should be emphasized that the issue of creativity as a component of organizational resilience remains a multidimensional topic, open to further exploration. Due to the complexity of the phenomenon and the limitations arising from the homogeneity of the sample (students from a single program and institution), it is recommended that future research be expanded to include other academic environments, fields of study, and diverse age and professional groups. Such an approach would allow for a better understanding of environmental and cultural factors influencing the development of creativity and resilience, thereby enriching knowledge in this important area of human resource management.

The study conducted among Management students at Lublin University of Technology demonstrated a high level of creative potential, evident in their propensity to generate original ideas and openness to new ways of problem-solving. Particularly important were personality traits conducive to creativity, such as cognitive perseverance, flexibility of thought,

and willingness to take intellectual risks. From the perspective of managerial competencies, it is especially noteworthy that creativity was frequently identified by respondents as one of the key attributes of a future leader. At the same time, many participants reported engagement in creative activities within project teams, reflecting the practical dimension of their innovative potential. This finding aligns with trends observed in other studies, where the younger generation not only values creativity but also perceives it as a fundamental condition for career development and professional achievement (Borowska, Pietron-Pyszczek, 2023).

These results are particularly significant in the context of digital transformation and the rapidly changing work environment. Managerial creativity is not an isolated individual ability but a function of interactions with the team, organizational structure, and an innovation-supportive culture (Amabile, Pratt, 2016). The students surveyed demonstrated awareness of the importance of soft skills, a willingness to take cognitive risks, and the ability to act under conditions of uncertainty - traits particularly valued in transformational and participatory leadership models. The collected data can serve as a basis for further comparative research; however, even at this stage, they indicate that management students possess a significant resource which, with appropriate educational and developmental support, can translate into tangible leadership and innovation competencies.

The study demonstrates that individuals exhibiting greater engagement in activities requiring creative thinking achieved higher results in areas such as cognitive fluency and flexibility. Additionally, respondents characterized by perseverance in completing complex tasks and openness to new approaches displayed higher creative potential, which can be interpreted as a significant element of their readiness to function under conditions of uncertainty. This phenomenon can be seen as evidence of the growing importance of creative competencies in the context of academic and professional resilience.

These findings align with a broader line of research on the role of creativity in adaptation processes. As noted by A. De Lorenzo et al. (2023), creativity plays a crucial role in building psychological resilience, as it promotes the development of cognitive flexibility and enhances an individual's sense of control over situations, particularly under conditions of crisis and uncertainty. Similarly, N.K. Zawadi (2024) suggests that creative expression supports coping mechanisms by reducing stress and strengthening confidence in one's own abilities.

In the study, students who rated their own creativity as high achieved better results in tasks requiring fluency and originality of thought - characteristics of creative, divergent thinking (Runco, Jaeger, 2012). Equally important, creativity supports emotional-behavioral resilience: it helps regulate stress, cope more effectively with emotional tension, and maintain motivation despite difficulties (Stańko-Kaczmarek, 2022). Students with greater tolerance for uncertainty and the ability to operate under chaotic conditions performed better in open-ended tasks, indicating that creativity can constitute a significant component of both cognitive and emotional resilience.

Moreover, creativity manifests in two key resilience functions: a preventive function - enabling the anticipation of threats and the planning of alternative courses of action (Sutcliffe, Vogus, 2003) - and a regenerative function, supporting the restoration and rebuilding of resources after a crisis. The study demonstrates that students active in extracurricular environments not only perform better on creative tasks but also exhibit greater resistance to prematurely ending tasks, reflecting perseverance and the capacity for sustained engagement even in the face of challenges. This aspect is directly linked to psychological resilience, understood as the ability to endure and maintain equilibrium in difficult situations.

International research confirms that creativity is one of the key competences developed in higher education. A review of 28 studies from 2018-2023 showed that most of them focused on undergraduate students in East Asia and the methods used were mainly surveys often without a solid theoretical basis (Setiamurti, Kurniawati, 2022). Student creativity varies across disciplines – experts in physics, history and poetry point to different characteristics, suggesting a need to adapt teaching methods to the specific nature of the field (Georgiou et al., 2022). A meta-analysis of 18 studies showed an average positive impact of creativity on academic achievement, pointing to its importance for cognitive development and motivation (Fan, Cai, 2022). M. Bouckaert (2023) emphasises the growing importance of creativity assessment in educational policies, although uniform tools are still lacking. In turn, research in Azerbaijan on a sample of 219 people showed that students' creativity can be effectively developed through teacher support, technology and motivation (Pozilova et al., 2023).

Managerial creativity currently constitutes one of the key competencies determining effective management in a turbulent organizational environment. In light of the literature review and the results of research conducted among management students at Lublin University of Technology, it can be concluded that the younger generation of future leaders possesses significant creative potential, which, with appropriate organizational support, can be effectively utilized in practice. Considering variables such as digital transformation, generational diversity, and organizational culture is essential for creativity to be effectively developed and implemented as a strategic organizational resource.

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