International Journal of Evaluation and Research in Education (IJERE)
Vol. 15, No. 6, December 2026, pp. 4843~4854
ISSN: 2252-8822, DOI: 10.11591/ijere.v15i6.39121

The dynamics of teacher resilience: from polarization to system stabilization (2021-2025)

Silvia Barnová, Lívia Hasajová, Daniel Lajčin, Gabriela Gabrhelová, Slávka Krásna, Denis Barna
Department of School Pedagogy and Psychology, DTI University, Dubnica nad Váhom, Slovakia

Article Info

Article history:

Received Feb 14, 2026
Revised Jul 26, 2026
Accepted Aug 6, 2026

Keywords:

Adversity
Polarization
Stabilization
Stress management
Teacher resilience

ABSTRACT

Teacher resilience is a dynamic construct shaped by both internal factors and external influences. Building on this premise and as a reaction to the lack of studies comparing teacher resilience levels across distinct points of time, the present study aims to examine whether there is a shift in teacher resilience levels between the period of post-COVID-19 polarization and the current phase of system stabilization. To compare the two periods and analyze resilience profiles, a quantitative comparative research design was employed, and the Slovak version of the 25-item Connor–Davidson Resilience Scale (CD-RISC-25) was administered to two comparable teacher samples in 2021 and again in 2025. The results revealed a statistically significant increase in overall teacher resilience between 2021 and 2025, which suggests that teachers are now better equipped to manage professional stress and workload. However, when considering the individual dimensions of the questionnaire, different developmental trends emerge. In the study, the need for systemic and organizational intervention to sustain long-term resilience is highlighted, which requires an understanding of how resilience develops under the impact of various circumstances. Thus, the study has implications for further research and educational practice.

This is an open access article under the CC BY-SA license.

Corresponding Author:

Silvia Barnová
Department of School Pedagogy and Psychology, DTI University
Ul. Sládkovičova 533/20, 01841 Dubnica nad Váhom, Slovakia
Email: barnova@dti.sk

1. INTRODUCTION

Despite the existence of a number of recent studies focusing on various aspects of teacher resilience, there remains a gap in available analyses that aim to compare the levels of teacher resilience in post-crisis phases distinct in time. International studies often rely on isolated cross-sectional data or focus on short-term crisis responses, thus not paying attention to how resilience evolves once acute stressors subside. Moreover, little is known about how prolonged, cumulative stress affects the deeper factor structure of resilience—particularly whether specific competencies are strengthened, weakened, or become more polarized over time. In response to this situation, the present study aims to fill this gap in the existing knowledge.

Teacher resilience is a multidimensional construct reflecting individuals' capacity to adapt to adversity in both personal and professional contexts [1]. It can significantly shape teachers' professional trajectories, influence their professional success, the scale of available coping strategies [2], teacher job satisfaction, self-efficacy, and their decisions whether to remain in or leave the teaching profession [3]–[6]. Although research consistently highlights factors that support resilient and successful teachers [7], limited attention has been paid to those who struggle to cope with job-related adversity.

Alongside internal factors, such as personality traits, emotional stability, coping strategies, teaching competencies, and social skills, resilience is shaped by external factors embedded in the work environment,

including leadership support, collegial relationships, mentoring, family support, and overall school climate. These protective factors can buffer the effects of stress, while their absence may function as a risk factor [7]–[9]. As available research studies confirm, a positive school culture, open organizational climate, supportive management, collaborative relationships, and reasonable workload have been repeatedly linked to higher levels of resilience [10]–[13].

Conceptualizations of teacher resilience vary. It may be viewed as a process of positive adaptation [14], an ability to manage uncertainty while maintaining balance and professional commitment [15], or a dynamic, developmental competence [16]. Resilient teachers are generally better equipped to manage challenging classroom situations and student behaviors, reducing the likelihood of stress-related symptoms [1], [17]. A typical feature of these teachers is their strong bonds with their schools and school communities, which enable them to leverage relationships with colleagues, leaders, and students to overcome difficulties [3]. They also work with adversity as an opportunity to learn. Moreover, the application of effective coping strategies under harsh circumstances contributes to reducing teacher anxiety levels and improving teacher well-being [18]. The teaching profession is demanding and, therefore, developing teacher resilience by means of targeted training programs is particularly important [19].

Resilience is defined as individuals' dynamic capacity to adapt to changing requirements. During the pandemic, teachers worked under unprecedented pressure associated with an urgent need to adopt digital tools and create digital content in combination with managing personal fears [20]–[23]. In this period, resilience primarily served as a mechanism for survival and acute adaptation.

With the onset of post-pandemic normalization, the nature of situations that require resilience has shifted. It is no longer an acute crisis response, but teachers are now confronted with cumulative stress arising from teaching diverse classrooms, addressing deepening socioemotional gaps among students, administrative burden. Teacher resilience is thus evolving from a defensive, self-protective mechanism into a regenerative capacity in line with its earlier definitions—the ability to maintain motivation, emotional balance, and professional commitment in persistently demanding conditions [15], [24]. Low levels of long-term resilience have been identified as a key predictor of burnout and intentions to leave the profession [25].

Figure 1 presents the conceptual framework guiding the study. It illustrates the theoretical assumption that teacher resilience is a dynamic, multidimensional construct shaped by changing educational contexts. The framework further assumes that individual resilience dimensions may respond differently to the transition from post-pandemic polarization to system stabilization, resulting in different patterns of change at the population level.

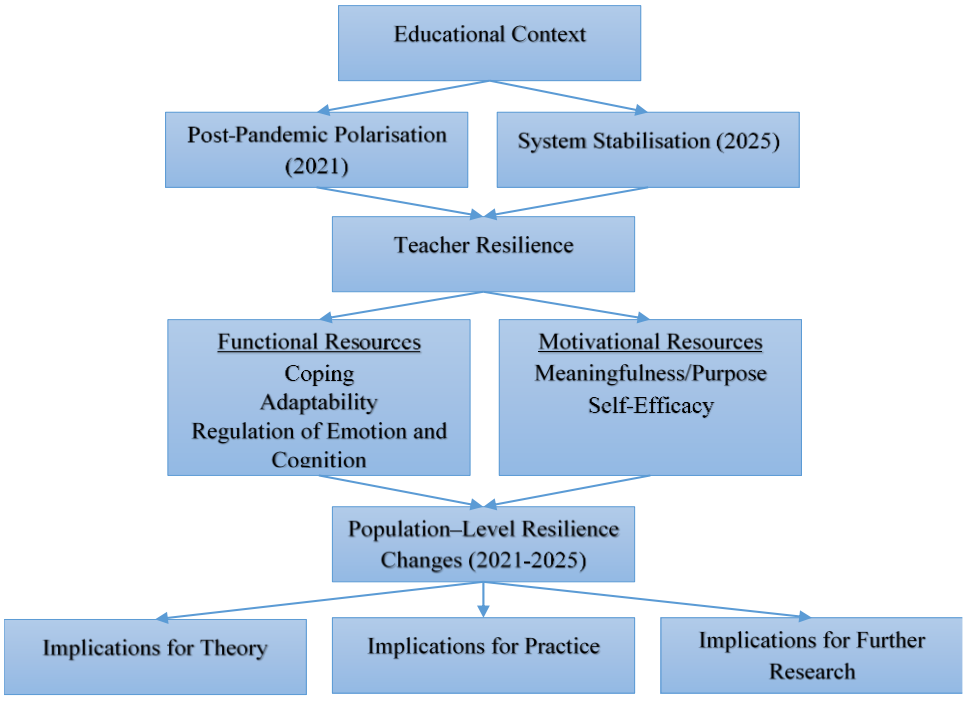


Figure 1. Conceptual framework of teacher resilience during the transition from post-pandemic polarization to system stabilization

The present study addresses a gap in the available literature by comparing teacher resilience levels in Slovakia at two key time points—2021, a period marked by high crisis load, hyper-mobilization of psychological resources, and post-pandemic turbulence; and 2025, a phase characterized by relative stabilization and a return to standard school operations. Unlike previous studies that examined teacher resilience within a single phase of the pandemic or its immediate aftermath, the present study compares two independent but demographically comparable teacher samples assessed using the same validated instrument at two distinct phases of post-pandemic recovery. Specifically, the focus is on whether overall teacher resilience and its underlying dimensions changed at the population level as educational systems transitioned from post-pandemic polarization towards relative stabilization. The study therefore aims to identify patterns of strengthening, stagnation, or decline and to answer not only how teacher resilience has changed over time but also why certain resilience dimensions remain more vulnerable or exhibit greater polarization than others.

The purpose of the study is therefore twofold. First, we seek to quantify shifts in teacher resilience during the transition from acute crisis to systemic stabilization. Second, we aim to interpret the presumed shifts, identify skills that may have been reinforced by the pandemic experience and pinpoint areas where chronic strain continues to undermine teacher well-being. Therefore, the study seeks to formulate targeted, evidence-based recommendations to support long-term teacher retention and strengthen internal motivation, particularly among educators who struggle most with meaning, confidence, and emotional balance.

The novelty of this research lies in advancing knowledge in the field of teacher resilience beyond the immediate crisis response by conceptualizing it as a dynamic, multidimensional construct shaped by both acute adversity and subsequent recovery. While previous research has largely focused on the impact of the COVID-19 crisis on teacher resilience or the role of teacher resilience in overcoming harsh circumstances during school closures, the present study, considering its limitations, suggests that post-crisis adaptation does not occur uniformly across resilience domains. Instead, the findings reveal that resilience develops through multiple adaptive pathways rather than a single recovery trajectory. By examining resilience in two distinct points that can be described as post-pandemic polarization and system stabilization, the study extends current resilience theory and provides an empirical basis for educational policies and intervention frameworks that better reflect teachers' evolving psychological needs.

2. METHOD

In the present study, the results of two surveys conducted in 2021 and 2025, employing the same instrument on samples with similar compositions, are analyzed and compared. The detailed results of the 2021 survey have already been published [1]. Figure 2 describes the research process.

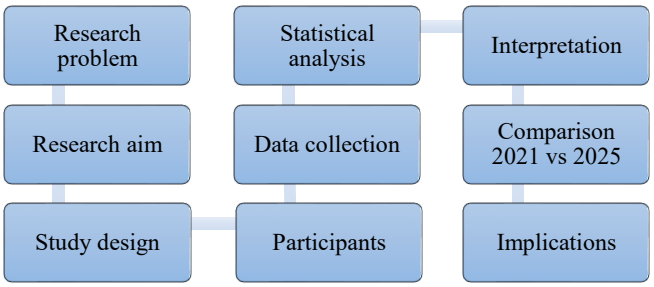


Figure 2. The research process

Selected resilience indicators between the years 2021 and 2025 were compared utilizing the standardized 25-item Connor–Davidson Resilience Scale (CD-RISC-25)^{SLOVAK}. Quantitative data were collected online via Google Forms, and all responses were anonymized. Data analysis was performed using SPSS and Microsoft Excel. The procedures included testing the psychometric characteristics of the research instrument, followed by descriptive statistics. To test the reliability of the instrument, Cronbach's alpha (α) was used. The values in both measurements exceeded the threshold of 0.80 (α=0.84 in 2021; α=0.87 in 2025), indicating a high level of reliability and stability of the research instrument. To describe central tendency, the arithmetic mean ($\bar{x}$) was used, and the standard deviation (σ) was applied as a measure of variability. Also, an independent samples t-test was performed to compare the overall resilience scores between teachers surveyed in 2021 and 2025.

The assumptions underlying the statistical analyses were evaluated prior to the main analyses. The normality of the overall resilience scores was assessed using the Shapiro–Wilk test, while the homogeneity of variances between the two groups was examined using Levene's test. Potential outliers were identified through a combination of visual inspection of boxplots and standardized z-scores, using the criterion $|z|>3.29$. All assumptions required for the independent-samples t-test were either satisfied or showed only negligible violations given the large sample sizes (N=474 and N=480), supporting the robustness of the parametric analyses.

Since data obtained from psychological questionnaires (such as the CD-RISC-25) often do not exhibit a perfectly normal distribution and are measured on an ordinal scale, the Mann–Whitney U test, which represents the most methodologically appropriate approach, was conservatively applied. The Mann–Whitney U test was used to analyze the resilience subscale scores, which were derived from ordinal Likert-scale responses. Unlike the t-test, it compares the distribution and rank order of values rather than group means, thereby eliminating the influence of extreme values (outliers).

In the present study, we specifically focused on two groups of teachers: the most vulnerable, who, according to their CD-RISC-25 results, fall into Q4, and the most resilient (those with the highest resilience scores), who were classified into Q1. We assumed that these two groups would reveal observable trends in teacher resilience development, as reflected in shifts in their assessed scores. Interpretation of results followed the methodological guidelines of the standardized instrument, with findings perceived as trends that may confirm or challenge existing theoretical assumptions.

2.1. Research instrument

In the study, teacher resilience was measured using the CD-RISC-25. It is a validated research tool measuring adults' capacity to cope with adversity and adapt to new circumstances. The instrument comprises 25 items rated on a 5-point Likert scale (0–4), yielding a total score of 0–100, with higher scores indicating greater resilience. The CD-RISC-25 measures seven dimensions: hardiness, coping, adaptability/flexibility, meaningfulness/purpose, optimism, regulation of emotion and cognition, and self-efficacy.

2.2. Research sample

In both phases of the study (2021 and 2025), the method of convenience sampling was employed. An emphasis was placed on regional representation across the country. Given that in both cases the questionnaires were distributed online and disseminated through various channels, and since the data were fully anonymized, it was not possible to ensure the same composition of the research sample (i.e., the same respondents or schools). Demographic data were collected for all participants, who were subsequently categorized according to the variables under investigation. Both research samples (N1 (2021)=474; N2 (2025)=480; N (Total)=954) comprised Slovak vocational school teachers, equally reflecting the gender imbalance of teachers typical for the Slovak education system, where female teachers statistically outnumber male teachers. The samples included teachers from all major age groups, as well as a wide range of teaching experience, as shown in Table 1.

Table 1. Composition of the sample—years 2021 and 2025

Teaching experience	Male 2021	Male 2025	Female 2021	Female 2025	Total 2021	Total 2025
0–10 years	141 (29.75%)	47 (9.79%)	153 (32.28%)	59 (12.29%)	294 (62.02%)	106 (22.08%)
11–20 years	15 (3.16%)	49 (10.21%)	39 (8.23%)	82 (17.08%)	54 (11.39%)	131 (27.29%)
21–30 years	18 (3.80%)	56 (11.67%)	57 (12.03%)	115 (23.96%)	75 (15.82%)	171 (35.63%)
31 years or more	18 (3.80%)	40 (8.33%)	33 (6.96%)	32 (6.67%)	51 (10.76%)	72 (15.00%)
Total	192 (40.51%)	192 (40.00%)	282 (59.49%)	288 (60.00%)	474 (100.00%)	480 (100.00%)

3. RESULTS

For precise analysis, both datasets (2021 and 2025) were examined using Cronbach's alpha (α). It was utilized to determine whether the items in the questionnaire consistently measure the underlying construct (i.e., resilience). In Table 2, data for 2021 and 2025 ($\alpha=0.84$; $\alpha=0.87$) are displayed, revealing differences in teacher responses. The presumed positive shift in teacher resilience between 2021 and 2025 was examined by performing an independent samples t-test, as shown in Table 3.

The calculated p-value ($p<0.001$) is significantly lower than the predetermined significance level of $\alpha=0.05$; i.e., the probability that the observed difference occurred by chance tends toward zero. The mean value in 2025 ($\bar{x}=4.08$) is numerically higher than in 2021 ($\bar{x}=3.72$). Based on the obtained data, the hypothesized increase in the overall level of teachers' resilience was confirmed—in 2025, it is statistically significantly higher than in 2021.

Table 2. Cronbach's alpha (α) coefficients: 2021 and 2025

Observed parameter	2021 (N=474)	2025 (N=480)	Interpretation
Mean ($\bar{x}$)	3.72	4.08	Increase in the level of resilience
Standard deviation (σ)	0.64	0.52	Responses are more consistent in 2025
Cronbach's alpha (α)	0.84	0.87	High reliability (above 0.7)

Note: ***p<0.001 indicates a high level of statistical significance

Table 3. Statistical characteristics of the independent samples t-test in 2021 and 2025

Observed parameter	2021 (N=474)	2025 (N=480)	Statistical test
Mean ($\bar{x}$)	3.72	4.08	t(952)=9.845; p < 0.001
Standard deviation (σ)	0.64	0.52	Cohen's d=0.64 [95% CI: 0.50; 0.78]
Standard error of the mean	0.029	0.024	moderate-to-large effect
95% confidence interval	[3.66; 3.78]	[4.03; 4.13]	Significance: ***

Note: ***p<0.001 indicates a high level of statistical significance. Cohen's d was calculated as the standardized mean difference. The observed effect size indicates a medium-to-large effect, suggesting substantial practical significance.

The Mann–Whitney U test in Table 4 indicates that the increase observed in the dimensions of adaptability (large effect, r=0.58), coping (medium-to-large effect, r=0.45), and regulation of emotion and cognition (medium-to-large effect, r=0.47) reflects an overall shift across the entire population of teachers. In 2025, the typical (median) teacher demonstrated a significantly higher rank in these dimensions than in 2021. The p-value (0.062) for meaningfulness/purpose further indicates that the distribution of the perceived meaningfulness of work remained largely unchanged between 2021 and 2025.

In 2025, the mean rank was significantly higher for almost all dimensions. The performed non-parametric analysis confirmed that the probability that a randomly selected teacher from 2025 demonstrated a higher level of adaptability (A) than a randomly selected teacher from 2021 is statistically significantly greater than 50% (U=41,680, p<0.001). Further data analysis shows that the polarization observed in 2021 reversed in 2025, and the distribution became more stable.

Table 4. Statistical characteristics of the Mann-Whitney U test for the dimensions in 2021 and 2025

Dimension	Sum of ranks (2021)	Sum of ranks (2025)	U Statistic	p-value	Rank-biserial correlation (r)	Significance
Hardiness	198,450	257,150	85,825	<0.001	0.38	***
Coping	185,120	270,480	72,500	<0.001	0.45	***
Adaptability	154,300	301,300	41,680	<0.001	0.58	***
Meaningfulness/Purpose	221,400	234,200	108,775	0.062	0.08	ns
Optimism	205,600	250,000	92,975	0.003	0.29	**
Regulation of emotion and cognition	182,450	273,150	69,825	<0.001	0.47	***
Self-efficacy	194,100	261,500	81,475	<0.001	0.41	***

Note: ns=statistically not significant; **p<0.01; ***p<0.001. The rank-biserial correlation (r) was used as the effect size measure, with values of approximately 0.10, 0.30, and 0.50 indicating small, medium, and large effects, respectively.

The stabilization of the strongest group (Q1) shown in Table 5 and visualized in Figure 3 suggests that after the crisis period around 2021, when even the resilience levels of the strongest group increased sharply under harsh circumstances, an expected decline in Q1 was observed in 2025 across subscales such as optimism, adaptability, self-efficacy, and regulation of emotion and cognition. This decrease represented a return to a normal, sustainable level of functioning after a period of extreme psychological mobilization.

Key shifts and trends lie in the reduction of vulnerability (improvement in Q4), with the most notable trend being the shrinking of the most vulnerable group (Q4). Regulation of emotion and cognition showed the greatest decrease in Q4 (-4.26%), but also meaningfulness declined sharply in Q4 (-4.26%). The group experiencing the most significant deficit in meaning (teachers with low scores on the meaningfulness/purpose subscale) decreased. Both coping and adaptability subscales showed reductions in Q4 (-3.26% and -3.37%, respectively). In 2025, 28.12% of teachers fell into the lowest quartile (Q4) for the meaningfulness/purpose subscale. This was the highest Q4 proportion across all subscales. Only 18.98% of all participating teachers reached the highest quartile (Q1) in this dimension. The most significant change between 2021 and 2025 was the reduction of the most vulnerable group (Q4) across most subscales, as shown in Table 6 and Figure 4.

Table 5. Comparison of Q1 resilience quartile preferences for all factors

Year	Hardiness (%)	Coping (%)	Adaptability/ flexibility (%)	Meaningfulness/ purpose (%)	Optimism (%)	Regulation of emotion and cognition (%)	Self-efficacy (%)
2021	26.04	10.85	31.11	22.24	42.50	20.33	24.78
2025	27.78	12.59	28.85	18.98	40.24	18.07	21.52

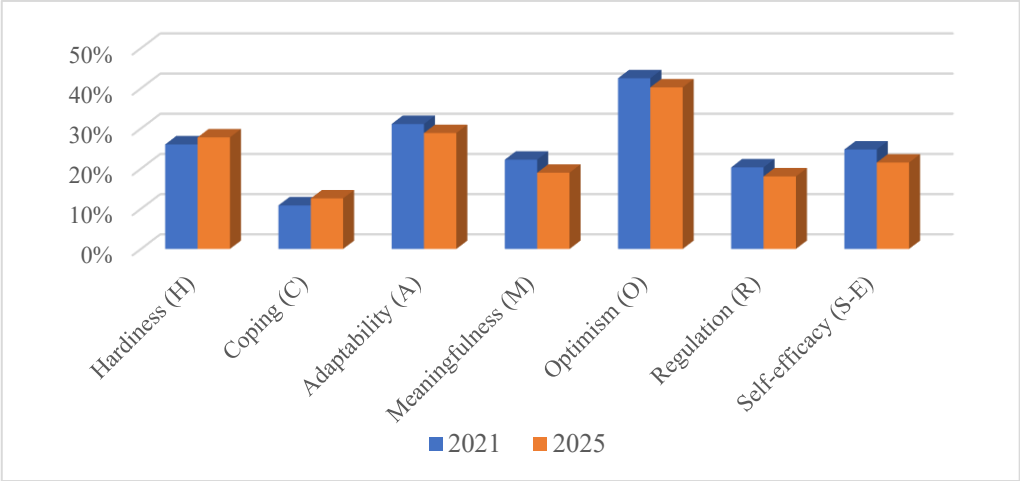


Figure 3. Q1 distribution of resilience across all factors

Table 6. Comparison of Q4 resilience quartile preferences for all factors

Year	Hardiness (%)	Coping (%)	Adaptability/ flexibility (%)	Meaningfulness/ purpose (%)	Optimism (%)	Regulation of emotion and cognition (%)	Self-efficacy (%)
2021	11.49	17.82	7.27	32.38	8.32	19.73	15.28
2025	11.23	14.56	3.90	28.12	6.06	15.47	13.22

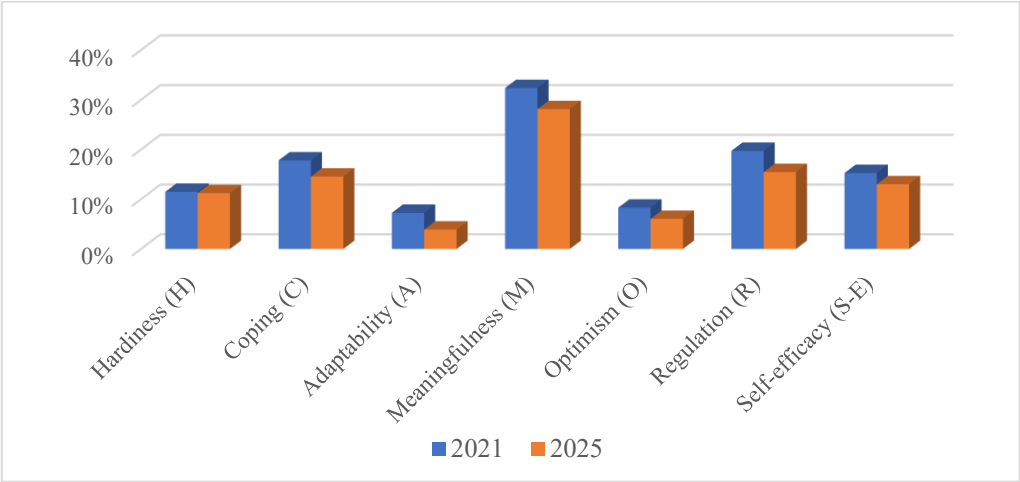


Figure 4. Q4 distribution of resilience across all factors

4. DISCUSSION

The study provides quantitative empirical evidence based on two large independent samples of Slovak vocational school teachers (N=474 in 2021; N=480 in 2025). Its key finding is that there was a statistically significant increase in teachers' resilience between 2021 and 2025, as evidenced by a higher mean score in 2025. It may be the consequence of heightened demands on teachers to adapt professionally following school closures during the pandemic, which required them to broaden their repertoire of coping strategies with new, context-specific ones. Another interesting finding is that response variability was lower in the 2025 survey, i.e., consistency in teacher responses was greater compared to 2021. This suggests that the observed positive development was not driven by highly resilient individuals but reflected a broader shift across the teacher population. Significant improvements were observed in several dimensions of resilience, particularly adaptability, coping, regulation of emotion and cognition, self-efficacy, optimism, and hardiness. However, in the meaningfulness/purpose dimension, no statistically significant shift was observed between years 2021 and 2025; thus, it can be concluded that teachers' sense of professional purpose was relatively stable regardless of the distance in time and the changed circumstances.

From a different perspective, the present findings provide statistical evidence that supports the theory of post-traumatic growth in the school environment. Teachers in 2025 did not exhibit signs of a decline in resilience after the COVID-19 period; on the contrary, they demonstrated signs of adaptive transformation. While in 2021 "distress" was perceived as an external adversary, in 2025, the ability to work under pressure was perceived as a stable personal attribute of the teacher.

The analysis of quartile distributions across the CD-RISC-25^{SLOVAK} resilience subscales in the two phases of investigation—in 2021 and 2025—revealed an interesting yet expected trend in teacher resilience development, characterized by partial recovery, stabilization, and the persistence of structural vulnerabilities. Overall, the findings suggest that the transition from 2021 to 2025 was characterized by a shift from post-pandemic polarization towards relative system stabilization. This trend was reflected not only in the increase in overall resilience but also in the reduction of the most vulnerable group across most resilience dimensions, indicating that teachers gradually regained psychological resources following a prolonged period of uncertainty. However, this recovery was not uniform across all domains, suggesting that different resilience components respond differently to changing professional demands and post-crisis conditions. Functional components of resilience—most notably coping and regulation of emotion and cognition—demonstrated clear positive shifts, suggesting that teachers adapted to prolonged exposure to adverse circumstances by broadening their scales of available coping strategies and developing more effective ones. The performed non-parametric analysis indicates that the reported improvements cannot be attributed solely to a small group of exceptionally resilient teachers but rather reflected a broader population-level shift. The finding supports the interpretation that teachers generally became better equipped to manage persistent occupational demands as educational systems gradually stabilized.

The observed increase in the group of teachers achieving the highest scores in CD-RISC-25^{SLOVAK} within the coping dimension aligns with findings from international studies indicating that adaptive coping skills are among the most malleable resilience resources in overcoming adversity, i.e., exposure to a chain of risk factors or a crisis [15], [24]. The improvement in the regulation of emotion and cognition dimension, as reflected in the reduction of the most vulnerable group, is particularly relevant for burnout prevention, as emotional dysregulation is consistently linked to teacher exhaustion and depersonalization [25]. Similarly, the decrease in the adaptability dimension can be interpreted as a natural post-crisis normalization effect. During the acute pandemic phase, when on-site teaching was not always possible, teachers were required to operate in a challenging state of hyper-adaptation, develop new skills both in themselves and their students, and modify their teaching. After the pandemic crisis, the subsequent period of stabilization reflects a gradual return to "normal" or a more sustainable model of functioning. This interpretation corresponds with resilience models that conceptualize resilience not as constant high performance but as the ability to keep normal functioning, recover, and rebalance, or simply bounce back, following harsh circumstances [26].

In contrast, two resilience dimensions show concerning trends according to the obtained results. Hardiness showed marked polarization, with an interesting growth in both the most resilient and most vulnerable groups. This divergence suggests diverse recovery trajectories, where some teachers strengthened their sense of control and commitment, while others experienced cumulative depletion. Such polarization has been documented in post-crisis occupational groups and is often associated with different accessibility of protective resources such as leadership support, autonomy, and collegial trust [7], [8].

Even more concerning is the weakening observed in the self-efficacy dimension, particularly within the middle resilience range. The decline in moderately high self-efficacy and the growth of the most vulnerable group suggests reduced beliefs in teachers' professional capabilities. The existence of a positive association between self-efficacy and teacher resilience was confirmed by a number of studies, e.g., by the meta-analysis performed by Mu *et al.* [27]. Therefore, this finding can be considered important in the context of studying teacher resilience development, especially when taking into account that teacher self-efficacy is a well-established predictor of instructional quality, job satisfaction, retention [28], [29] and alongside teacher resilience and adaptability, also teacher engagement [30]. Likewise, this is in line with Yang [31] findings that confirm self-efficacy is a significant mediator between teacher resilience and teacher engagement, as well as teacher resilience and wellbeing. Furthermore, Zhou *et al.* [32] reported positive associations between resilience and self-efficacy on one hand, and well being on the other. The observed decline in self-efficacy may reflect increasing administrative burden, subjectively perceived reduced professional autonomy, and sustained accountability pressures—factors that are widely identified as post-pandemic stressors [22].

However, the most critical finding of this study is the presence of a chronic, resistant deficit in perceived meaningfulness. Despite the observed trend of overall stabilization across most dimensions, meaningfulness/purpose remains the weakest resilience component, with a surprising 27% of teachers in the lowest quartile. International research findings underscore that one's ability to find meaning in job-related tasks is central to teacher motivation, engagement, and long-term retention [16], [33]. Consistent with the absence of a statistically significant change between 2021 and 2025, these findings suggest that professional meaning is comparatively resistant to change. Unlike functional resilience competencies that may improve

through repeated exposure to adversity and the development of adaptive coping strategies, meaningfulness appears to depend more strongly on organizational conditions, professional autonomy, and teachers' opportunities to experience their work as valuable and purposeful. The data obtained in this dimension suggest that a lack of professional meaning is a structural issue rather than a temporary crisis effect. Without targeted systemic and organizational interventions, this deficit may continue to undermine teacher well-being even as functional coping capacities improve.

Taken together, the results suggest that post-crisis adaptation can broaden the range of coping strategies among individuals; i.e., teachers can learn to manage stress more effectively, but motivational and self-evaluative dimensions of resilience may remain either chronically weakened or at risk of further decline. These results underscore the need for targeted intervention programs that go beyond individual coping-strategy development and address broader organizational and policy-level conditions that shape professional meaning, autonomy, and self-efficacy. Strengthening teachers' sense of purpose and restoring confidence in their professional role should therefore be prioritized.

4.1. Theoretical implications

The findings extend current resilience theory by showing that: i) teacher resilience is a dynamic and multidimensional process rather than a stable trait; ii) different resilience dimensions follow distinct recovery trajectories, with functional competencies improving more rapidly than motivational resources; and iii) the results support a non-linear conceptualization of post-crisis resilience development shaped by both individual adaptation and organizational context.

4.2. Implications for practice

The study also has practical implications. The results indicate a clear need for implementing targeted measures promoting teacher resilience at both the national and school levels. At the national educational policy level, teacher resilience should be recognized as a strategic priority, as it directly influences teacher retention, instructional quality, and the long-term sustainability of the teaching workforce.

Creating positive school environments is a must, and there are certain specific areas that require increased attention. The most critical one was identified in the meaningfulness/purpose dimension. It can be assumed that developing teachers' skills to promote their well-being is not enough, but restoring professional meaning comes to the forefront. This can be achieved by involving teachers in decision-making processes, curriculum development, and school vision building. This requires active school leadership strengthening teachers' sense of professional purpose by promoting supportive organizational cultures, collaborative professional relationships, and professional autonomy. By introducing these measures, also the observed decline in self-efficacy can be addressed.

The polarization observed in the hardiness dimension indicates unequal recovery trajectories among teachers, signaling that uniform support measures are not sufficient and the provided support must be individualized. This can be achieved by offering mentoring and coaching programs, especially to teachers in vulnerable resilience quartiles. Such mentoring initiatives should be systematically incorporated into school improvement strategies and supported through national induction. However, also teachers in the middle resilience range represent a high-risk group, as adversity may push them toward vulnerability. In their case, preventive interventions should focus specifically on early identification of the presence of cumulative risk factors and the availability of peer mentoring and support before burnout symptoms emerge. School leadership should therefore consider establishing well-being monitoring on a regular basis and implement early intervention mechanisms to identify teachers experiencing prolonged or increased context-specific occupational stress before serious psychological difficulties develop.

The observed improvement in the coping and regulation of emotion and cognition dimensions is a clearly positive finding, indicating that in the period between 2021 and 2025, teachers successfully expanded their repertoire of stress-management (coping) strategies. Therefore, sustainable resilience maintenance programs should be applied, targeted at managing emotional and cognitive demands and preventing exhaustion leading to chronic overload or even burnout. These programs should be embedded within continuous professional development systems rather than offered only as isolated interventions following periods of crisis. They should also include systematic emotional regulation training to reduce teachers' vulnerability. Furthermore, competencies such as stress management, emotional regulation, adaptive coping, and reflective practice should be integrated into pre-service teacher education, including pre-service teachers' teaching practice [34]. At the national level, comprehensive teacher well-being programs that combine organizational support, professional learning, mentoring, and resilience training into a coherent long-term strategy should be introduced.

5. CONCLUSION

This study investigated the presumed dynamic character of teacher resilience by examining teacher resilience at two distinct points in time characterized by different contexts—the post-COVID-19 polarization in 2021 and systemic stabilization in 2025. Using the CD-RISC-25^{SLOVAK}, teacher resilience profiles at two distinct time points were compared. The findings help better understand the role and characteristics of teacher resilience by viewing it as a dynamic and context-dependent construct influenced by prolonged exposure to stress and an individual's capacity to recover subsequently. The primary contribution of this study lies in demonstrating that post-crisis teacher resilience development cannot be considered a uniform process but must be worked with as a multidimensional and differentiated phenomenon, with individual resilience components following distinct recovery trajectories. By combining overall resilience scores with factor- and quartile-level analyses, the study reveals certain patterns of stabilization, persistent vulnerability, and polarization that would remain hidden if only global resilience indices were considered.

Overall, the results point to a process of adaptive transformation in the teaching profession, in which resilience develops as an important resource for managing complex and changing educational conditions. However, the findings also demonstrate that although teachers may become more effective in managing stress, long-term well-being and retention do not necessarily follow automatically, since a deeper analysis by classifying teachers into quartiles according to their level of resilience shows that some resilience dimensions recover more slowly than others. From a theoretical perspective, these findings support contemporary conceptualizations of resilience as a dynamic developmental process. They further suggest that resilience competencies can be categorized as either functional, such as coping and regulation of emotion and cognition, which may recover relatively quickly, or motivational, particularly meaningfulness/purpose and self-efficacy, which remain more resistant to change and require longer-term support.

For the broader community, the results highlight that for sustainable resilience development, interventions should extend beyond individual coping strategies. Instead, these should address organizational conditions to promote a sense of professional meaning, autonomy, and self-efficacy. Strengthening teachers' sense of purpose and restoring confidence in their professional role, where the biggest problems were detected, is especially important. Offering targeted programs to teachers should therefore represent a central priority for schools and educational policymakers. Thus, the present findings have important implications for educational practice. They support the implementation of comprehensive resilience policies that combine individual resilience training with systemic measures, including supportive school leadership, structured mentoring programs, continuous professional development, emotionally supportive school climates, and teacher well-being initiatives embedded within educational policy and both pre-service and in-service teacher training.

The originality of this study lies in its cross-sectional, factor-level comparison of teacher resilience across two post-crisis phases. The findings demonstrate that teacher resilience is a dynamic, multidimensional construct that develops beyond the immediate crisis period. They further reveal that resilience follows a non-linear trajectory characterized by stabilization, differentiation, and selective vulnerability.

Despite the insights provided by this study, several limitations should be acknowledged when interpreting the results. First, the use of convenience sampling limits the generalizability of the findings. Therefore, the results should be interpreted with caution also beyond the population of Slovak vocational school teachers. Second, although the study compares two relatively distinct time points, the design does not follow the same individuals longitudinally, which limits causal interpretation of changes in resilience. On the other hand, the relatively large and demographically diverse research sample, along with the use of a validated research instrument, strengthens the robustness of the findings. Therefore, future research should employ true longitudinal designs to track resilience development trajectories in the same teachers over time, i.e., across multiple time points, to identify causal mechanisms underlying resilience development and explore contextual and organizational factors (policy interventions, leadership support, school climate, workload, and professional autonomy) influencing them. This should help better understand the impact of various factors on teacher resilience. It is also particularly important to identify causal relationships between crisis exposure, coping strategies, and long-term professional adaptation. Quantitative research methods should be combined with qualitative approaches to explore teachers' lived experiences. Such research activities would support the development of evidence-based resilience frameworks. Moreover, combining longitudinal quantitative analyses with qualitative approaches would further advance resilience theory by capturing not only how resilience changes but also why different resilience dimensions recover at different rates under changing educational conditions.

FUNDING INFORMATION

The article is an output of the international grant project IGA 001DTIPE/2025_26.

AUTHOR CONTRIBUTIONS STATEMENT

This journal uses the Contributor Roles Taxonomy (CRediT) to recognize individual author contributions, reduce authorship disputes, and facilitate collaboration.

Name of Author	C	M	So	Va	Fo	I	R	D	O	E	Vi	Su	P	Fu
Silvia Barnová	✓					✓	✓	✓	✓				✓	
Lívia Hasajová		✓	✓	✓						✓				
Daniel Lajčin		✓								✓				✓
Gabriela Gabrhelová	✓									✓		✓		
Slávka Krásna					✓	✓	✓		✓					
Denis Barna					✓					✓	✓			

CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

INFORMED CONSENT

Informed consent was obtained from all subjects involved in the study.

ETHICAL APPROVAL

The study was conducted in accordance with the Declaration of Helsinki, and approved by the Board for Internal System of Quality Assurance of DTI University, Slovakia, in compliance with the Code of Ethics of DTI University, Slovakia.

DATA AVAILABILITY

The data that support the findings of this study are available from the corresponding author, [SB], upon reasonable request.

REFERENCES

[1] S. Barnová, M. Vochozka, S. Krásna, G. Gabrhelová, and D. Barna, "Gender differences and stereotypes in teacher resilience research," *Emerging Science Journal*, vol. 8, pp. 192–205, Jul. 2024, doi: 10.28991/ESJ-2024-SIED1-011.

[2] H. J. Boon, "Teachers' resilience: conceived, perceived or lived-in," in *Cultivating Teacher Resilience: International Approaches, Applications and Impact*, C. F. Mansfield, Ed., Singapore: Springer Singapore, 2020, pp. 263–278, doi: 10.1007/978-981-15-5963-1_16.

[3] S. V. Drew and C. Sosnowski, "Emerging theory of teacher resilience: a situational analysis," *English Teaching: Practice & Critique*, vol. 18, no. 4, pp. 492–507, Nov. 2019, doi: 10.1108/ETPC-12-2018-0118.

[4] J. Pretsch, B. Flunger, and M. Schmitt, "Resilience predicts well-being in teachers, but not in non-teaching employees," *Social Psychology of Education*, vol. 15, no. 3, pp. 321–336, Sep. 2012, doi: 10.1007/s11218-012-9180-8.

[5] D. Trikoilis, "Resilient teachers stay: personality predictors of retention in Greek schools," *The Teacher Educator*, vol. 61, no. 1, pp. 62–83, Jan. 2026, doi: 10.1080/08878730.2025.2543800.

[6] J. Chen, "Reimaging teacher resilience for flourishing," *The Asia-Pacific Education Researcher*, vol. 33, no. 6, pp. 1363–1372, Dec. 2024, doi: 10.1007/s40299-023-00810-5.

[7] S. Beltman, C. Mansfield, and A. Price, "Thriving not just surviving: a review of research on teacher resilience," *Educational Research Review*, vol. 6, no. 3, pp. 185–207, Jan. 2011, doi: 10.1016/j.edurev.2011.09.001.

[8] S. Ainsworth and J. Oldfield, "Quantifying teacher resilience: context matters," *Teaching and Teacher Education*, vol. 82, pp. 117–128, Jun. 2019, doi: 10.1016/j.tate.2019.03.012.

[9] D. Bagdžiūnienė, A. Kazlauskienė, D. Nasvytienė, and E. Sakadolskis, "Resources of emotional resilience and its mediating role in teachers' well-being and intention to leave," *Frontiers in Psychology*, vol. 14, p. 1305979, Nov. 2023, doi: 10.3389/fpsyg.2023.1305979.

[10] C. Day, "Resilient principals in challenging schools: the courage and costs of conviction," *Teachers and Teaching*, vol. 20, no. 5, pp. 638–654, Sep. 2014, doi: 10.1080/13540602.2014.937959.

[11] B. Johnson *et al.*, "Promoting early career teacher resilience: a framework for understanding and acting," *Teachers and Teaching*, vol. 20, no. 5, pp. 530–546, Sep. 2014, doi: 10.1080/13540602.2014.937957.

[12] M. Cameron and S. Lovett, "Sustaining the commitment and realising the potential of highly promising teachers," *Teachers and Teaching*, vol. 21, no. 2, pp. 150–163, Feb. 2015, doi: 10.1080/13540602.2014.928132.

[13] G. J. Brunetti, "Resilience under fire: perspectives on the work of experienced, inner city high school teachers in the United States," *Teaching and Teacher Education*, vol. 22, no. 7, pp. 812–825, Oct. 2006, doi: 10.1016/j.tate.2006.04.027.

[14] M. Clarà, "Teacher resilience and meaning transformation: how teachers reappraise situations of adversity," *Teaching and Teacher Education*, vol. 63, pp. 82–91, Apr. 2017, doi: 10.1016/j.tate.2016.12.010.

[15] Q. Gu and C. Day, "Challenges to teacher resilience: conditions count," *British Educational Research Journal*, vol. 39, no. 1, pp. 22–44, Feb. 2013, doi: 10.1080/01411926.2011.623152.

[16] Q. Gu, "The role of relational resilience in teachers' career-long commitment and effectiveness," *Teachers and Teaching*, vol. 20, no. 5, pp. 502–529, Sep. 2014, doi: 10.1080/13540602.2014.937961.
[17] S. Barnová, S. Treľová, S. Krásna, E. Beňová, L. Hasajová, and G. Gabrhelová, "Leadership styles, organizational climate, and school climate openness from the perspective of Slovak vocational school teachers," *Societies*, vol. 12, no. 6, p. 192, Dec. 2022, doi: 10.3390/soc12060192.
[18] H. Wang, S. Y. Lee, and N. C. Hall, "Coping profiles among teachers: implications for emotions, job satisfaction, burnout, and quitting intentions," *Contemporary Educational Psychology*, vol. 68, p. 102030, Jan. 2022, doi: 10.1016/j.cedpsych.2021.102030.
[19] T. Pozo-Rico, R. Poveda, R. Gutiérrez-Fresneda, J. L. Castejón, and R. Gilar-Corbi, "Revamping teacher training for challenging times: teachers' well-being, resilience, emotional intelligence, and innovative methodologies as key teaching competencies," *Psychology Research and Behavior Management*, vol. 16, pp. 1–18, Jan. 2023, doi: 10.2147/PRBM.S382572.
[20] J. König, D. J. Jäger-Biela, and N. Glutsch, "Adapting to online teaching during COVID-19 school closure: teacher education and teacher competence effects among early career teachers in Germany," *European Journal of Teacher Education*, vol. 43, no. 4, pp. 608–622, Aug. 2020, doi: 10.1080/02619768.2020.1809650.
[21] T. Pressley, "Factors contributing to teacher burnout during COVID-19," *Educational Researcher*, vol. 50, no. 5, pp. 325–327, Jun. 2021, doi: 10.3102/0013189X211004138.
[22] OECD, *The state of school education: one year into the COVID pandemic*. Paris: OECD Publishing, 2021, doi: 10.1787/201dde84-en.
[23] L. E. Kim and K. Asbury, "'Like a rug had been pulled from under you': the impact of COVID-19 on teachers in England during the first six weeks of the UK lockdown," *British Journal of Educational Psychology*, vol. 90, no. 4, pp. 1062–1083, Dec. 2020, doi: 10.1111/bjep.12381.
[24] C. F. Mansfield, S. Beltman, T. Broadley, and N. Weatherby-Fell, "Building resilience in teacher education: an evidenced informed framework," *Teaching and Teacher Education*, vol. 54, pp. 77–87, Feb. 2016, doi: 10.1016/j.tate.2015.11.016.
[25] E. M. Skaalvik and S. Skaalvik, "Teacher stress and teacher self-efficacy as predictors of engagement, emotional exhaustion, and motivation to leave the teaching profession," *Creative Education*, vol. 7, no. 13, p. 1785, 2016, doi: 10.4236/ce.2016.713182.
[26] G. A. Bonanno, "Loss, trauma, and human resilience: have we underestimated the human capacity to thrive after extremely aversive events?" *American Psychologist*, vol. 59, no. 1, pp. 20–28, 2004, doi: 10.1037/0003-066X.59.1.20.
[27] G. M. Mu *et al.*, "A meta-analysis of the correlation between teacher self-efficacy and teacher resilience: concerted growth and contextual variance," *Educational Research Review*, vol. 45, p. 100645, Nov. 2024, doi: 10.1016/j.edurev.2024.100645.
[28] M. Tschannen-Moran, A. W. Hoy, and W. K. Hoy, "Teacher efficacy: its meaning and measure," *Review of Educational Research*, vol. 68, no. 2, pp. 202–248, Jun. 1998, doi: 10.3102/00346543068002202.
[29] R. M. Klassen and M. M. Chiu, "Effects on teachers' self-efficacy and job satisfaction: teacher gender, years of experience, and job stress," *Journal of Educational Psychology*, vol. 102, no. 3, pp. 741–756, Aug. 2010, doi: 10.1037/a0019237.
[30] D. Alonzo, L. Sheridan, S. Zhou, H. T. M. Nguyen, X. Gao, and T. L. Durksen, "Teachers' engagement and occupational commitment in a centralised education system," *Teaching and Teacher Education*, vol. 168, p. 105233, Dec. 2025, doi: 10.1016/j.tate.2025.105233.
[31] J. Yang, "Demonstrating the interplay between resilience, engagement, and wellbeing among Chinese teachers: the mediating role of self-efficacy," *Frontiers in Psychology*, vol. 17, p. 1744771, Mar. 2026, doi: 10.3389/fpsyg.2026.1744771.
[32] S. Zhou, G. R. Slemp, and D. A. Vella-Brodrick, "Factors associated with teacher wellbeing: a meta-analysis," *Educational Psychology Review*, vol. 36, no. 2, p. 63, Jun. 2024, doi: 10.1007/s10648-024-09886-x.
[33] R. M. Ryan and E. L. Deci, *Self-determination theory: basic psychological needs in motivation, development, and wellness*. New York, NY: Guilford Press, 2017, doi: 10.1521/978.14625/28806.
[34] L. Xing and X. Wu, "The 'more is better' fallacy in pre-service teacher training: a positive psychology perspective on the resilience-building process and job satisfaction," *Frontiers in Psychology*, vol. 17, p. 1885723, Jun. 2026, doi: 10.3389/fpsyg.2026.1885723.

BIOGRAPHIES OF AUTHORS



Silvia Barnová holds the position of an associate professor at DTI University in Dubnica nad Váhom, Slovakia and is the director of a private school that provides pre-primary, primary, and secondary education. She graduated from Comenius University in Bratislava, where she also earned her Ph.D. degree in 2010. She is a member of the Scientific Board of DTI University in Dubnica nad Váhom. Within her research activities and publication work, she focuses on the field of school management, crisis planning in education, distance teaching, inclusive education and teacher resilience. Currently, she is the Editor-in-Chief of Health and Humanity – Journal of Social, Health and Humanities Sciences, the managing editor of the Scientific Journal Acta Educationis Generalis, and a member of the editorial boards of scientific journals. She can be contacted at email: barnova@dti.sk.



Lívia Hasajová currently holds the position of an associate professor at DTI University in Dubnica nad Váhom, Slovakia. She is an expert in the fields of mathematics, applied mathematics, and statistics for managers. She earned her university degrees at the Faculty of Natural Sciences and the Faculty of Mathematics, Physics and Informatics and studied at Constantine the Philosopher University in Nitra, where she earned her Ph.D. degree in 2008. In her research work, she deals with mathematical and statistical solutions within research projects. She is the author and co-author of a number of publications and the chief investigator or a co-investigator in several research projects. She can be contacted at email: hasajova@dti.sk.



Daniel Lajčin is the chairman of the Board of Trustees of DTI University and a member of its Scientific Board. He is a professor in the field of Management and at the same time serves as the Chief Executive Officer of an international holding company focused on education and information technology. In his teaching, scientific, and research publications, he focuses on educational management and management with an emphasis on coping with stress and challenging life situations. He is the author and co-author of a number of monographs, textbooks, and scientific articles. He can be contacted at email: lajcin@dti.sk.



Gabriela Gabrhelová is the director of DTI University in Dubnica nad Váhom, Slovakia, where she also holds the position of a professor. She earned her university degree at the Faculty of Management at Presov University, where she also earned her Ph.D. degree in 2012. In 2018, she graduated from DTI University, where she completed teacher training. She is a recognized expert in the fields of Management and Field didactics. In her research and scientific work, she focuses on the issues of emotional intelligence in school leaders, resilience, teachers' key competencies, further education and training, distance teaching, and inclusive education. She has been the chief investigator and a co-investigator of a number of research projects and cooperates with both public and private universities in Slovakia and abroad. She can be contacted at email: gabrhelova@dti.sk.



Slávka Krásna received the Ph.D. degree in education from the University of Newcastle, U.K. She has over 20 years of experience as an academician with the Universiti Teknologi Malaysia (UTM), where she is currently an associate professor and the Chair of the School of Education, Faculty of Social Sciences and Humanities. Her current research interests include students' learning and development at various levels and areas of education. Her publication topics include ecology, educational courses, educational institutions, engineering education, natural resources, recycling, and sustainable development. She can be contacted at email: krasna@dti.sk.



Denis Barna currently works at DTI University in Dubnica nad Váhom, Slovakia and is the Director of Mercury School – a private educational institution providing pre-primary, primary, lower-secondary, and upper-secondary education. He holds a Ph.D. degree in Vocational Subject Didactics and a master's degree in Management. In his research activities and publication work, he focuses on the areas of school management and educational leadership, crisis planning in education, and teacher resilience. He can be contacted at email: barna@dti.sk.