

Рад примљен: 29. 9. 2022.

Рад прихваћен: 15. 5. 2023.

Оригинални
научни рад

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Emergency Education as a Catalyst for Teacher Change: Extent and Correlates of the Class and Subject Teachers' Growth of Competences

Abstract: *The aim of this study was to explore the possibility that the emergency education during the Covid-19 pandemic served as a catalyst for teacher development. We investigated the growth of teachers' competences that were highlighted by the online teaching, and looked into personal and school factors that stimulated or restricted this growth. Four domains of expected teacher growth were chosen: general digital competence, pedagogical-digital competence, competence for student assessment, and competence for conducting inclusive practices. A total of 314 teachers filled out an online questionnaire and rated their pre-pandemic and current levels of 18 items describing skills, beliefs, and attitudes of the four selected domains. The instrument also included scales for measuring school-related (leadership, teacher autonomy, collaboration) and teacher-related variables (teacher self-efficacy, growth mindset, reflective practice). The results of the paired samples t-test showed that improvements of the competences were significant in all four domains, and the highest in the domain of pedagogical-digital competence. Partial correlations revealed that teacher-level variables were more important factors of the growth than school-related variables. Differences between the class and subject teachers were found. Recommendations are given in the direction of supporting the emerged good practices and maintaining of the developed competences in the post-pandemic era.*

Keywords: *teacher competence development, remote teaching, Covid-19 pandemic, school-level factors, teacher-level factors*

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² The study is a part of the project *Čovek i društvo u vreme krize* funded by the Faculty of Philosophy, University of Belgrade.

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"Only a crisis – actual or perceived – produces real change.
When that crisis occurs, the actions that are taken
depend on the ideas that are lying around."
Milton Friedman, 1982.

Introduction

The Covid-19 pandemic caused a crisis in education that was overwhelming for all stakeholders (Bubb & Jones, 2020; Kovacs-Cerović et al, 2021; Mičić et al., 2022), and negatively impacted equity (Thorn & Vincent-Lancrin, 2021) and outcomes of education (Schleicher, 2020) for the years to come. This paper focuses on teachers and draws on the stance of authors who consider this crisis as a catalyst for educational change (Zhao, 2020; Azorin, 2020). In that sense, we take an optimistic view on the challenge of the altered conditions of schooling and consider them as an opportunity for teachers to further develop their competences in certain domains. The most salient example is the use of digital technologies in teaching the introduction of which in education started several decades ago (Selwyn, 2016), and was an inevitable part of the remote education during the pandemic. Also, the emergency education brought up some systemic questions, such as different educational needs of students (e.g., Grewenig et al., 2021) or the exams ethics (e.g., Stančić, 2021) while the approaches for dealing with these questions were based on the seeds of reform that policymakers started sowing decades ago. Hence, rather than restoring the status quo after the pandemic is over, we advocate for the idea that the crisis should be taken advantage of for further shaping the teaching practices in desirable directions (Zhao, 2020; Azorin, 2020). There are already several studies confirming that, for example, competences and motivation to use digital technology have improved since the beginning of the pandemic both among the academic (Myrsky et al., 2022) and the schoolteachers (Beardsley et al., 2021). Therefore, the goal of this study is to explore the growth of the class and subject teachers' competences that were highlighted by the emergency education, and to look

into personal and school factors that enabled or inhibited this growth.

Conceptual framework

Selection of teacher change domains

The selection of the investigated domains of teacher change is based on our findings from a year-long narrative study during the pandemic (Kovac-Cerović et al, 2020; Jokić Zorkić et al., 2021; Mičić et al., 2021). The findings from one part of this research (Mičić & Vračar, 2022) suggested that, expectedly, online teaching made teachers more competent for using digital technologies both in a general sense and for teaching. Here it is important to make a distinction between digital competence and pedagogical-digital competence. *Pedagogical-digital competence* is a more specific concept than general digital competence as it assumes teachers' will, knowledge, and ability to use technology in pedagogically meaningful manner to support students' learning, which includes proper epistemic knowledge and attitudes towards digitalization in education (Korhonen et al., 2021). *General digital competence* is for the purpose of this work conceptualized as skills and knowledge for using computers and application software for practical purposes (Martin & Grudziecki, 2006).

Further, our findings showed that teachers' work during the pandemic had to accommodate for the fact that the altered conditions of schooling increased the differences among the students (e.g., differences in the internet access). These differences became more visible to the teachers and made them more willing to use individualized approaches in teaching, and consequently to further develop their *Inclusive practices competence*. Finally, many concerns about cheating in exams emerged in the online environment, encouraging teachers to get creative with the assessment techniques and made them willing to try alternative assessment methods, strengthening their *Students assessment competence*.

Factors related to the development of teachers' competences

When approaching the question of teacher development, theoretical models (e.g., Opfer & Pedder, 2011; McMillan et al., 2016) and studies (Geijsel et al., 2009; Zhang et al., 2021; Tančić, 2022; Lin et al., 2022) consider both teacher-related and school-related factors. Generally, the studies find that teacher-level factors are more contributing to teachers' professional development, but that school-level factors are influential as well (Zhang et al., 2021; Tančić, 2022). Following this line of thought, we opted for examining both teacher-related and school-related factors that enabled or perhaps inhibited the development of teachers' competences during the emergency education. We selected three teacher-level factors, and three school-level factors based on their relevance for professional development in the context of emergency education.

Teacher-related factors

Teacher self-efficacy refers to teachers' perceptions of their own ability to bring about desirable outcomes of teaching by affecting their students' learning, even when faced with obstacles (Tschannen-Moran & Hoy, 2001). This construct is relevant in the context of studying teacher change, as it is linked to openness for adopting new teaching strategies (Lin et al., 2022; Malmberg et al., 2014), the enthusiasm for learning (Geijsel et al., 2009), the frequency of participation in professional development programs (Tančić, 2022; Yoon & Kim, 2022) and to teachers' resilience in face of hardship (Daniilidou et al., 2020).

Teacher reflective practice assumes teachers' systemic inquiry into themselves and their practices (Mathew et al., 2017) by carefully and persistently rethinking their own actions with awareness of beliefs and knowledge they hold (Budevac et al., 2015) ensuring a continuous learning (Habib, 2017). As

reflective practitioners, teachers are more aware of their work and its effects, which consequently leads to their professional growth and improves their teaching performance (Zahid & Khanam, 2019). Reflective practice is selected as one of the variables in this study as it is a foundation and a tool for professional development (Hrevnack, 2011).

Mindset refers to beliefs about the nature of human abilities. People with a fixed mindset believe that abilities are given at birth and fixed, while people with a growth mindset believe that abilities could be improved through work and learning (Dweck and Yeager, 2019; Dweck & Leggett, 1988). In challenging circumstances, those with fixed mindsets tend to feel helpless and avoid failure through focusing on performance, while people with a growth mindset tend to be more persistent and mastery oriented (Dweck & Leggett, 1988). Teachers' mindset is important for both students' (Dweck, 2014) and their own development. Studies have shown that a growth mindset is linked to adoption of desirable teaching strategies (Lin et al., 2022), more constructive engagement in professional learning activities (Lischka et al., 2015) and considering professional literature more frequently (Gero, 2013).

School-related factors

School leadership has been identified among the most important features of effective schools (Leithwood et al., 2008), as behaviours of principals can create an ethos in which teachers can achieve their full potential (Hallinger & Heck, 1996). For this study, we selected the lens of instructional leadership (Hallinger, 2003) which assumes that school principals strive to improve educational outcomes by being directly involved in the teaching process, encouraging collaborations and teachers' professional development. We included this variable being that such practices of a principal could provide a systemic support for students and teachers faced with the unknown of the emergency education.

Teacher autonomy has been described as a teacher's sense of their independence from influence (Pitt, 2010), the freedom to manage both their own behavior and the environment in which they operate (Pearson & Hall, 1993). Teacher autonomy has many positive effects, such as teaching self-efficacy (Skaalvik & Skaalvik, 2014) or teaching performance (Blase & Kirby, 2009, according to Parker, 2015). Autonomy focuses on the duty of teachers to be always ready to do their job and grow professionally (Smith, 2000), and is related to the accountability of teachers (Oberfield, 2016) - concepts that were highly important in emergency education during the pandemic.

Collaboration in a school collective includes a shared task-related focus, joint work and joint reflection for job-related purposes (James et al., 2007). This concept is selected as one of the school-level variables since the evidence show that collaboration also enhances teacher change and improvement by means of minimizing resistance towards change (Hargreaves, 2019), exchanging ideas, knowledge and practices, and providing guidance and support in face of dilemmas and obstacles (Ostovar-Nameghi & Sheikahmadi, 2016).

Method

The aims of the study

The aim of this study is to investigate the development of teachers' competences in four domains: general digital competence (GDC), pedagogical-digital competence (PDC), student assessment competence (SAC), and inclusive practices competence (IPC) - since the beginning of the pandemic. Considering the different initial education of class and subject teachers, the study also aims to investigate possible differences in the extent of the development of the four competences between these two groups. Finally, the study aims at exploring teacher-level and school-level factors that supported or obstructed teacher growth in the four selected domains.

Sample

A total of 314 teachers filled out an online instrument during Spring 2022. The sample resembles the population of teachers in Serbia in terms of the most important stratification variables, as shown in Table 1. Average number of years of professional experience is 19.8 (Class teacher=22.97, Subject teachers=18.32), which is somewhat below the average for the population³. Since participants were recruited via social networks and mailing lists, the sample most likely underrepresents the teachers who do not regularly go online.

Table 1. Distributions of relevant groups within the sample.

Variable	Group	N	%
Gender	Male	28	8.9%
	Female	286	91.1%
Type of settlement	Urban	223	71.0%
	Rural	91	29.0%
Level	Elementary school	232	73.9%
	Secondary school	82	26.1%
Role	Class teacher	100	31.8%
	Subject teacher	214	68.2%

Measures

Data was collected by an instrument designed for the study. It consisted of four parts:

1. *General questions* were used to collect demographic data shown in Table 1.

2. *Levels of competences before the pandemic and currently* (in the moment of filling out the questionnaire) were measured by 18 items describing skills, beliefs, and attitudes in the four selected domains that were based on the relevant competences' frameworks (Okvir digitalnih kompetencija nastavnika, 2017; European agency for development in special needs education, 2012; Anderson, 2013).

³ The information is obtained from the Ministry of Education, Science, and Technological Development for the 2021/22. school year.

Teachers were asked to rate their levels of development of listed items on a 7-point scale two times sequentially: first they retrospectively rated their initial, pre-pandemic level of development on each item, and then they rated their current level of development on each item. From this scale we extracted 12 measures, i.e., the following three measures were calculated for each of the four domains: (1) initial level of development of the competence – average of the initial scale scores for the competence's corresponding items; (2) current level of development of competence – average of the current scale scores for the competence's corresponding items, and (3) improvement of competence – difference between the current and the initial level of the competence. The overview of the 12 measures with items' examples and reliability coefficients is shown in Table 2.

3. *School-related factors* included three subscales. Teachers were asked to rate the extent to which each item described the school they work in on a 7-point scale (1 – does not describe my school at all, 7 – describes my school perfectly). Teachers working in multiple schools were instructed to base their answers on the experience of the school they had the most scheduled hours in, i.e., the highest workload. All subscales were expressed as regression score factors based on PCA. The three subscales, based on TALIS questionnaire (OECD, 2020), are as follows. *Collaboration* subscale was measured by 6 items

(item e.g., “In the school I work in I can go to a colleague when I need help or advice regarding teaching”, $\alpha=.819$). *Teacher autonomy* subscale had 2 items (item e.g., “The school I work in supports teachers' initiatives”, $\alpha=.907$). *Leadership* was measured with 4 items (item e.g., “The principal of the school I work in encourages development of teachers”, $\alpha=.941$). All subscales were expressed as regression score factors based on PCA.

4. *Teacher-related factors* comprised three subscales with 19 items which were rated on a 5-point scale. *Teacher self-efficacy* subscale was based on the TALIS questionnaire (OECD, 2019) and had 10 items (E.g., “Maintaining discipline in the classroom”; $\alpha=.940$). *Growth mindset* subscale was based on Dweck's *Self-form for adults* (1999) and had 3 items (E.g., “No matter who you are, you can significantly change your intelligence level.” $\alpha=.791$). *Reflective practice* subscale was based on Larrivee's (2008) tool for assessing teachers' level of reflective practice, and had 5 items (e.g., “I take into consideration students' feedback and adjust my practice accordingly”, $\alpha=.890$).

Data analyses

To answer our research questions, we analyzed data using paired samples t-test, independent samples t-test, and partial correlations. The analyses were conducted in IBM SPSS 23.

Table 2. Description of the measures of four domains of competences.

Domain	Number of items	Item example	Initial level scale α	Current level scale α	Improvement scale α
GDC	5	“Using programmes for text editing”	.918	.922	.831
PDC	5	“Using advantages of the digital environment for achieving the goal of the class more efficiently”	.931	.942	.886
SAC	4	“Using alternative assessment methods (student presentation, portfolio)”	.853	.914	.753
IPC	4	“Taking into account students' interests while teaching”	.951	.958	.861

Results

The improvement of teachers' competences during the pandemic

Results of paired-samples t-test, shown in Table 3, indicate that differences between the initial and the current levels of the competences, i.e., the improvements of the competences, were significant in all four domains.

Table 3. Means and standard deviations of initial and current levels of the four competences and the improvement significance statistics.

Competence		Mean	S.D.	t	p
GDC	Initial	4.801	1.610	14.269	.000
	Current	5.397	1.443		
PDC	Initial	3.368	1.634	25.422	.000
	Current	5.180	1.460		
SAC	Initial	4.488	1.498	16.645	.000
	Current	5.330	1.393		
IPC	Initial	4.946	1.516	12.214	.000
	Current	5.459	1.356		

*Note. S.D. is standard deviation. The number of degrees of freedom for all t tests in this table is 312.

Teachers' average initial levels of GDC, SAC and IPC were above the theoretical average of 4

points, while their average initial level of PDC was somewhat below the theoretical average. Descriptive measures showed that the improvement was the greatest in the domain of PDC (difference of 1.81). The initial levels and improvements of competences are visually depicted in Figure 1.

Comparison of class and subject teachers' competences improvement

We compared class teachers' and subject teachers' initial and current levels of the competences, as well as the improvements in all four domains. Results of independent samples t-test in Table 4 show no significant differences between the two groups in the initial levels of SAC and IPC, while class teachers rated their initial levels of GDC and PDC lower than the subject teachers did. On the other hand, current levels of competences showed no significant differences in all four domains.

The analyses of differences in the improvement measures showed that class teachers' improvement was higher than subject teachers' in GDC ($t(163.110)=3.751, p=.000$) and PDC ($t(312)=2.226, p=.027$) – the two domains where differences in initial levels were significant. The competences of the two groups of teachers improved to a similar extent in the domain of SAC ($t(312)=1.559, p=.120$) and IPC ($t(312)=-.310, p=.757$). The class and subject teachers' average initial levels and improvements in the four domains are depicted in Figure 2.

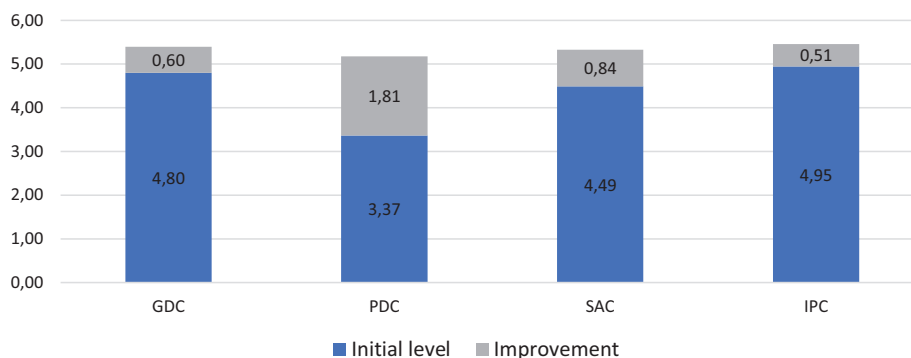


Figure 1. Initial levels and improvements of competences in the four domains.

Table 4. Comparisons of class teachers and subject teachers in initial and current levels in the four domains of competences.

Competence	Group	Initial level				Current level			
		Mean	S.D.	<i>t</i>	<i>p</i>	Mean	S.D.	<i>t</i>	<i>p</i>
GDC	Class teachers	4.45	1.57	-2.68	.008	5.28	1.44	-.95	.344
	Subject teachers	4.97	1.60			5.45	1.45		
PDC	Class teachers	3.02	1.48	-2.62	.009	5.06	1.46	-.99	.322
	Subject teachers	3.53	1.68			5.24	1.46		
SAC	Class teachers	4.30	1.44	-1.15	.123	5.26	1.37	-.66	.513
	Subject teachers	4.58	1.52			5.37	1.41		
IPC	Class teachers	5.05	1.53	.81	.418	5.54	1.37	-.87	.500
	Subject teachers	4.90	1.51			5.42	1.35		

*Note. S.D. is standard deviation. The number of degrees of freedom for all t tests in this table is 312.

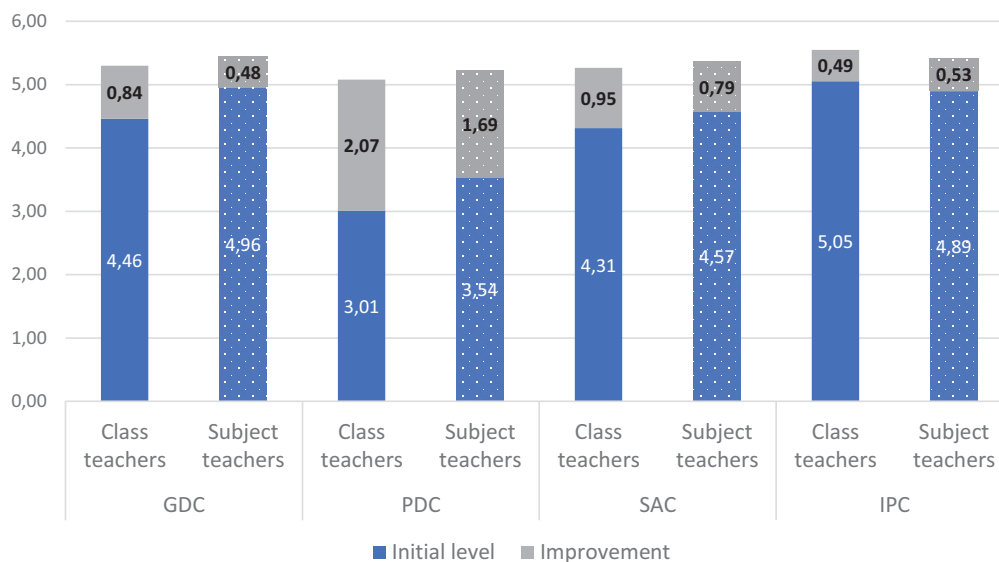


Figure 2. Initial levels and improvements of competences of class and subject teachers in the four domains.

Teacher-level and school-level correlates of the improvement of the competences

Finally, we conducted partial correlation analyses to inspect the relationships of the improvement measures with the school-related and teacher-related factors. We opted for partial correlation analysis in order to control for the initial levels of the competences. Partial correlations and corresponding *p* values are shown in Table 5.

Among the school-level factors, only collaboration was an important correlate of the improvement of PDC. Teacher-level factors had more and higher correlations with the measures of improvement. Growth mindset had significant moderate correlations with the growth of PDC, and a rather low correlation with the growth of IPC. However, the growth mindset's correlation with the growth of GDC was marginally significant. Reflective practice moderately correlated with the growth GDC, PDC, and SAC, but was not related to IPC. And finally, teacher self-efficacy was moderately correlated to the growth of PDC, but unrelated to the growth in the other three domains.

Discussion

Development in science, technology, and society steer educational reforms, but the success of the endeavors to change the education is dependent on the success of endeavors to change the teachers (Cheng & Huang, 2018). Therefore, aligning teachers' beliefs, feelings, and choices with the goals of a reform is crucial for ensuring its effective implementation (Bridwell-Mitchell, 2015). And while the implementation of a reform is often slow, with the "grammar of schooling" being rather resilient to the reformative efforts (Tyack & Tobin, 1994), these rigid routines and practices were powerless when faced with the Covid-19 pandemic (Zhao, 2020). The unwanted change of educational processes introduced by the pandemic forced teachers worldwide to rapidly shift to a different kind of teaching. This change faced them with many obstacles that served as an opportunity for growth.

The results of this study suggest that the teachers in Serbia did take the opportunity to develop their competences during the emergency education in the four examined domains. Teachers rated their initial levels of GDC, SAC, and IPC somewhat above the theoretical average of the scale. However, the pre-pandemic level of PDC had an average score

Table 5. Partial correlations (and p values) of the four domains of competences with school-related and teacher-related factors after controlling for the initial levels of the competences.

Factor	GDC	PDC	SAC	IPC
Instructional leadership	.073 (.313)	.067 (.350)	.059 (.417)	-.107 (.138)
Teacher autonomy	.035 (.627)	.119 (.098)	.022 (.763)	-.093 (.197)
Collaboration	.058 (.418)	.178 (.013)	.065 (.366)	-.141 (.051)
Teacher self-efficacy	.072 (.316)	.204 (.004)	.133 (.065)	.065 (.865)
Growth mindset	.137 (.057)	.302 (.000)	.247 (.001)	.151 (.036)
Reflective practice	.211 (.003)	.325 (.000)	.249 (.000)	.118 (.103)

below the theoretical average, but also the greatest growth. Being that the PDC was the pillar of education during the pandemic, it is expectable that this domain had the highest growth. Also, the findings show teachers' awareness that their PDC was underdeveloped for full online teaching at the beginning of the pandemic. It also gives a notion of their understanding that online teaching doesn't only assume transferring regular teaching practices to the online environment (Korhonen et al., 2021). It is worth noting that teachers' ratings of their current levels in all four domains of competences are below the theoretical maximum (between 5.18 and 5.45 of 7), showing that teachers recognize the need for further improvement.

Class teachers rated their initial levels of GDC and DPC lower than the subject teachers did, while the two groups didn't differ in initial SAC and IPC. The difference might be explained by the fact that the group of class teachers consists of more teachers who finished their initial education before the expansion of technology, as indicated by the difference in the number of years of teaching experience of the two groups. Another possible explanation could be the fact that the subject teachers group includes natural and technical sciences' teachers whose exposure to technology is very high. Also, being that GDC is a prerequisite for DPC, it seems that class teachers' lower confidence in using technology posed an obstacle for using it in teaching.

As in other studies, the teacher-level factors were shown as better predictors of growth than the school-related factors (Geijsel et al., 2009; Zhang et al., 2021; Tančić, 2022). On the school level, only collaboration showed as an important factor of development of PDC, suggesting that a horizontal exchange of ideas and peer support in face of obstacles was important for helping teachers to master the new teaching medium and to maximize the usage of its pedagogical potential, which is a process of learning identified in other studies (Ostovar-Nameghi & Sheikahmadi, 2016). Regarding PDC,

all three teacher-level factors were linked to the increase in the levels of the competence. Teacher self-efficacy was a relevant factor only in this domain, suggesting that teachers who were more confident in the classroom more easily managed teaching in the online world which enabled growth.

Beliefs that hard work leads to growth, i.e., the growth mindset likely served as a motivating factor that empowered teachers to try hard - which boosted all competences' progress, although its correlation with GDC was marginally significant. Reflective practice, a process through which learning happens (Hrevnack, 2011) could be considered as one of the mechanisms through which teachers were working on and fine adjusting their GDC, PDC, and SAC. It is unexpected that this factor was not relevant in the case of IPC, whose growth was probably enhanced by some factors that were not included in this study.

Apart from this causal interpretation of these correlations, another conclusion from these findings is that more enthusiastic and proficient teachers used the opportunity for growth more as all three teacher-level variables, aside from being growth factors (Habib, 2017; Dweck & Leggett, 1988), are characteristics of a good teacher (Zahid & Khanam, 2019; Dweck, 2014).

There are several limitations of this study. First, the effects of the emergency education to the growth of the competences cannot be separated from the effects of the naturally occurring development. However, being that this growth was so rapid, it could be considered as the consequence of the exposure to a different kind of working environment during emergency education. Another shortcoming of this study is that we used self-reported measures of the competences and that initial levels of the competences were retrospectively assessed. Also, the sample is biased as it was selected online and thus excluded teachers who are less prone to using technology - which was one of the key aspects of this study.

Conclusion

The results of this study indicate that the emergency education enabled teacher change. Teachers reported observed improvement in all four selected domains of competences. The altered conditions of teaching made them more skillful with technology which empowered them to embark the journey of digitally mediated teaching. Hardship they faced when teaching their students whose differences in schooling conditions suddenly drastically increased, made them more prone to embrace the perks of the individualized approach in teaching to answer each student's educational needs. Absence of the in-person interactions led to ethical issues in assessment and motivated teachers to explore alternative ways of assessing their students' knowledge. Our findings suggest that this development was steered by the teachers themselves and not by the environments they work in. Growth mindset and reflective practice served as the most important factors that enabled the growth, the former - because it empowered teachers to try hard, the latter - because it served as a tool for guiding the development.

Several recommendations can be drawn from these findings. First, policy makers should prevent a post-pandemic regression to the old state of affairs, and support teachers in keeping good practices and further nurturing competences that emerged during the emergency education. Future studies could collect these good practices, select the most effective ones, and provide an input for additional training for teachers. Such additional trainings for development of competences for assessment, individualization, and using digital technology in teaching should be adjusted for different levels of development of these competences. But prior to carrying out these trainings, programs for professional development should aim at strengthening teachers' growth mindset (as it turned out to be an important motivating factor of undertaking professional development) and reflective practice of teachers (as it works as a leverage in the developmental process). And finally, school leaders should provide their collectives with opportunities and conditions for collaboration and collegial support.

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ОБРАЗОВАЊЕ ТОКОМ ПАНДЕМИЈЕ КАО КАТАЛИЗАТОР ПРОМЕНЕ НАСТАВНИКА: ИНТЕНЗИТЕТ И КОРЕЛАТИ РАЗВОЈА КОМПЕТЕНЦИЈА НАСТАВНИКА РАЗРЕДНЕ И ПРЕДМЕТНЕ НАСТАВЕ

У раду се сагледавају позитивни аспекти измењеног начина реализације наставе током пандемије, истражујући развој наставничких компетенција и факторе који су му допринели или га сирежавали, као и евентуалне разлике између наставника разредне и предметне наставе. Ослањајући се на истраживање реализовано током пандемије, селектована су четири домена наставничких компетенција: општа дициплина компетенција, педагошко-дициплина компетенција, компетенција за оцењивање и компетенција за диференцијацију наставе. Као лични фактори релевантни у процесу развоја компетенција на основу прегледа литературе одабрани су самоефикасност наставника, рефлексивност у раду и мајндсет раста, који, осим што представљају одлике ефективне наставника, чине и предуслове за учење и развој. Међу факторима на нивоу школе увршћени су педагошко лидерство, аутономија наставника и сарадња у колективу као одлике школске климе која подржава усавршавање наставника. Онлајн-уџбеник развијен за подреде истраживања попустио је 314 наставника, чије демографске карактеристике осликавају општу популацију наставника у Србији. На седмостепенској скали испитаници су оценили своје иницијалне (препандемијске) и тренутне нивое компетенција на 18 ставки кроз које се оптимизују четири одабрана домена компетенција. Осим мера иницијалних и тренутних нивоа, у истраживању је коришћена и мера најређка, која је изражена као њихова разлика – за све четири компетенције. Уџбеник је садржао и ставке које кроз скале Ликертовог петог мере одабране личне и школске факторе. Уџбеник је показао добре метријске карактеристике. Анализа података подразумевала је т-тест за зависне узорке, т-тест за независне узорке и рачунање парцијалне корелације. Резултати су показали да су наставничке компетенције порасле значајно у сва четири домена, а највише у домену општо-педагошке компетенције. Наставници разредне наставе оценили су нивое својих иницијалних компетенција у домену опште дициплине и педагошко-дициплине компетенције ниже него наставници предметне наставе. Међутим, према резултатима, наставници разредне наставе остварили су већи најређак него наставници предметне наставе. Када је реч о корелацијама, израчунаће су парцијалне корелације између четири мере најређка компетенција и шест фактора уз контролисање иницијалног нивоа сваке компетенције. Резултати су показали да на нивоу школских фактора једино сарадња у колективу остварује значајну корелацију са најређком педагошко-дициплина компетенције. У складу са преходним истраживањима, лични фактори су се показали као више повезани са најређком него школски фактори. Самоефикасност је била значајан корелат педагошко-дициплина компетенције, указујући да су наставници који су били самоуверенији у ученици били и сиремнији да своју наставну праксу трансформишу за подреде диципличног медијума. Мајндсет раста се показао као

значај корелациј напрејка у сва четири домена, мада је значајности његове корелације са општом дијигналном компетенцијом била маргинална. Овај налаз указује да је уверење да је способност моћне развијати кроз учење и труд био мотивациони фактор који је наставнике охрабрио да се упусти у овладавање новим праксама. Коначно, рефлексивна пракса у настави показала се као корелација свих компетенција, осим компетенције за диференцијацију наставе, чије је развој наизглед био подстиакнућ факторима који нису били део ове студије. Овај налаз указује да је рефлексивна пракса служила као процес кроз који су наставници обликовали и додешавали своје праксе током реализације наставе на даљину, обезбеђујући тако њихов развој. Осим каузалне интерпретације ових налаза, чини се да ови резултати указују и да су прилику за најредак више искористили квалитетни наставници, будући да су све три варијабле, поред тога што су фактори раста, такође и одлике доброг наставника. Свеукупно, ови налази показују да наставници током пандемије јесу искористили прилику да унапреде своје компетенције, али и да овај раст није био усмераван системски, већ су мотивисани и ентузијастични појединци сами управљали својим развојем и променом. Полазећи од идеје да је ковид криза представљала прилику за промену у образовним процесима, рад износи препоруке које су усмерене на његовање и даљи развој добрих пракси и компетенција које је образовање током пандемије изнедрило. Сутерише се обезбеђивање обука прилагођених различитим нивоима наставничких компетенција, али и пројекти стручној усавршавања кроз које ће се систематски подржавати развој рефлексивности у настави и најдсећа раста, које ово истраживање идентификује као најважније елементе професионалног развоја наставника.

Кључне речи: развој наставничких компетенција, настава на даљину, ковид-19, школски фактори, наставнички фактори