Research Article https://doi.org/10.12973/eu-jer.13.2.693

European Journal of Educational Research
Volume 13, Issue 2, 693 - 703.
ISSN: 2165-8714
https://www.eu-jer.com/

# Principal Support and Teacher Self-Efficacy as Predictors of Collective Teacher Efficacy

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*Received: July 12, 2023 ▪ Revised: September 22, 2023 ▪ Accepted: October 18, 2023*

**Abstract:** This study investigated the extent to which demographic variables, principal support and teacher self-efficacy contribute to the collective teacher efficacy. In the study, a non-probability purposive sample was used, which included 761 teachers working in compulsory primary schools in all parts of the Republic of Croatia. The first part of the administered online questionnaire provided data on sociodemographic characteristics of the respondents, while in the second part, the following scales were used: The Principal Support Scale, The Teacher Sense of Teacher Efficacy Scale and The Collective Teacher Efficacy Scale. The results of the performed regression analyses show that: 1) the demographic variables - workplace, promotion to a higher rank and principal support have a predictive value in explaining teachers' self-efficacy; 2) an average number of students per class, promotion to a higher rank, principal support, teacher engagement and teaching strategies have a predictive value in explaining collective teacher efficacy. The findings of this study will be discussed in terms of their potential impact and future research.

**Keywords:** *Collective teacher efficacy, principal support, teacher self-efficacy.*

**To cite this article:** Đuranović, M., Klasnić, I., & Vidić, T. (2024). Principal support and teacher self-efficacy as predictors of collective teacher efficacy. *European Journal of Educational Research, 13*(2), 693-703. https://doi.org/10.12973/eu-jer.13.2.693

## Introduction

The concept of self-efficacy was introduced and described by Albert Bandura in the late 1970s (Bandura, 1977). Bandura described self-efficacy as one's belief in their own ability to act successfully in particular situations. According to Bandura (1977, 1997), people's perceptions of self-efficacy stem from four sources: previous experiences, indirect experiences (i.e., other people's experiences), social persuasions, and emotional and physiological states. People's beliefs in their own abilities have a significant impact on the actual abilities.

Nowadays, a vast body of research is focused on student self-efficacy. However, in order for a classroom to function well and to be managed properly, teachers' self-efficacy is of utmost importance (Morris et al., 2017). Klassen and Tze (2014) point out the factors which are important for understanding the significance of teacher efficacy, as they can potentially influence the process of selection of future teachers, enhance training, teachers' professional development and improve the educational outcomes. Apart from the fact that teachers act individually, in schools they act as part of the collective. Schools in which teachers tend to collaborate exhibit a high level of collective efficacy, and these schools are more likely to encourage their students and motivate them to study (R. D. Goddard et al., 2000). Maddux and Gosselin (2012, p. 214) define collective efficacy as "the extent to which people believe they can work together effectively to accomplish their shared goals". In the education context, the support that teachers receive from the principals in their schools is of great significance. Principals as school leaders play a key role in both the students' and teachers' learning process (Leithwood et al., 2020). The principals' self-efficacy beliefs act as a positive and statistically significant predictor of teachers' collective efficacy beliefs, which, in the end, is a predictor of student achievement (R. D. Goddard et al., 2021). In this study, the relationship between principal support, teacher self-efficacy and collective teacher efficacy was examined, as these are all significant constructs in school functioning.

### *Principal Support*

Principals are key factors of efficient schools. They ensure a stimulating environment in which both students and teachers can work (Liebowitz & Porter, 2019). X. Zheng et al. (2019) refer to the results of research investigating a positive relationship between principal behaviour and teacher self-efficacy. The principals who have a clear vision and clear goals

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for student learning and quality work of teachers ensure all necessary conditions for professional development and self-efficacy of teachers (McGuigan & Hoy, 2006; Shengnan & Hallinger, 2020). Furthermore, teacher self-efficacy and collective teacher efficacy principals can also be supported by principals by creating an inspiring school vision and mission, by setting challenging but achievable goals, by creating optimistic and motivating work environment and by encouraging collaboration.

Research suggests that an engaging school climate and collective teacher efficacy are among the fundamental elements of an efficient and quality school (Freiberg, 1999; Friend & Cook, 2012), and it is precisely these elements that principals can affect directly with their behaviour and the way in which they run schools. A higher level of perceived principal support motivates teachers to collaborate more with their colleagues (Castro Silva et al., 2017), which results in better academic achievements of their students (Wilson et al., 2002). Principal support is a multidimensional construct which includes various aspects, such as emotional, informative, and instrumental aspects, and encouragement (Littrell et al., 1994). In the existing literature, the importance of support for innovations (Anderson & West, 1998) and professional development and growth of teachers (Cook & Friend, 1995) has also been emphasized. Principal support and collective efficacy are two influential factors which are directly related to teacher job satisfaction (Olsen & Huang, 2019). The employees who feel that they have a higher level of principal support tend to exhibit a higher level of affiliation to school, experience less stress and burnout, and are less likely to have health problems and are less likely to stop working in their profession (Littrell et al., 1994).

*Teacher Self-Efficacy*

Bandura (1997, p. 3) defines self-efficacy as "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments". The self-efficacy concept was first developed by Albert Bandura within his Social Cognitive Theory. This theory emphasizes interaction between personal factors (e.g., cognition, beliefs), behaviour and environment (Bandura, 1986). Beliefs in one's abilities depend on the ways in which a person perceives obstacles in their environment and on how much effort and persistence they would invest to overcome these obstacles and achieve the desired goal.

Self-efficacy has been studied and examined in various fields of human activity, including education. In the teacher context, "beliefs about the ability both of the team and of the faculty of teachers at the school to execute courses of action required to produce given attainments" (Skaalvik & Skaalvik, 2007, p. 613). Furthermore, self-efficacy of a teacher includes their perception of their own abilities to achieve the desired results with demanding and unmotivated students (Tschannen-Moran & Hoy, 2001). Shoulders and Krei (2015) describe self-efficacy as a cognitive mechanism which regulates behaviour, strengthens self-confidence and helps a person to become better and more efficient in their work. According to research results, there is a positive relationship between teacher self-efficacy and achievements (Kim & Seo, 2018; Ross, 1992; Wang, 2022) and self-efficacy of their students (Schwab, 2019). The teachers who are more self-efficient are also more open to inclusive education (Woodcock & Jones, 2020). They accept new ideas easily, support the introduced changes, apply new teaching methods and strategies, exhibit a higher level of planning and organization, are more constructive when facing the mistakes of their students and are more persistent in dealing with difficulties (Cerit, 2013; Tschannen-Moran et al., 1998). The teachers who exhibit more self-efficacy are more satisfied with their work and they experience a lower level of stress and burnout (Aloe et al., 2014; Collie et al., 2012). Teacher self-efficacy is shaped not only by the characteristics of a particular teacher (e.g., gender, work experience), but also the characteristics of a class, school characteristics and the principal (e.g., work experience, school management style) (Fackler & Malmberg, 2016).

*Collective Efficacy*

Bandura defined collective efficacy as "a group's shared belief in its conjoint capabilities to organize and execute the courses of action required to produce given levels of attainments" (1997, p. 477). R. D. Goddard et al. (2000, p. 480) point out that collective teacher efficacy implies "the perceptions of teachers in a school that the efforts of the faculty as a whole will have a positive effect on students". Collective teacher efficacy implies the teachers' beliefs in their ability to work as a team and to achieve positive results (Sánchez-Rosas et al., 2022).

Collective teacher efficacy has a positive relationship with a great number of variables relating to students and teachers themselves. According to research results, a positive relationship was found between collective teacher efficacy and student success (Ramos et al., 2014). Based on the conducted meta-analysis, Eells (2011, as cited in Zhou, 2019) points to a strong positive impact of the relationship between collective teacher efficacy and student achievement; as collective teacher efficacy in school increases, student achievement increases as well. Collective teacher efficacy significantly contributes to the quality of inclusive education (for example, by investing joint effort to include parents in school activities in a meaningful way, or through joint discussions about the most efficient ways of modifying behaviour of the students with learning difficulties) (Lyons et al., 2016). In schools where collective teacher efficacy is pronounced, there is a lower number of students who are excluded from school as a way to deal with their problem behaviour (Gibbs & Powell, 2012). Furthermore, it is less likely that novice teachers will start considering leaving their teaching profession if they find employment in schools with a high level of collective efficacy (Tiplic et al., 2015). Furthermore, there is a

positive relationship between collective teacher efficacy and job satisfaction and a lower level of stress triggered by inappropriate student behaviour (Klassen et al., 2010). Yurt (2022) cites the research results which indicate that collective teacher efficacy is positively related to job satisfaction, and negatively related to burnout.

All teachers in Croatia have a high level of education qualifications (ISCED, Level 7) and have a right to and an obligation to take part in professional development activities throughout their career. The teaching profession in Croatia is feminised, as most of primary school teachers are females. Primary school teachers are divided into classroom teachers and subject teachers. Based on the amount of continuing professional development activities and high-quality work, they can be promoted to higher ranks. The working life lasts till the age of 65, so by the time they retire, the teachers will have had an average of 40 years of work experience. Schools are run by principals, who are teachers by profession as well, with the actual teaching experience. Their job description includes providing support to teachers, among other things.

Research carried out so far in Croatian schools indicates relatively high perceptions of teacher self-efficacy and job satisfaction. These perceptions are lower when it comes to emotional exhaustions, depersonalisation and principal support (T. Vidić et al., 2021). With the aim of expanding the existing knowledge, in the research we examined to which extent demographic variables, principal support and teacher self-efficacy contribute to collective teacher efficacy. Quantitative approach was applied in the study.

## Methodology

*Research Design*

The following tasks were designed:

1. to examine how much the demographic variables and principal support can contribute to explaining teacher self-efficacy;

2. to examine how much the demographic variables, principal support and teacher self-efficacy can contribute to explaining collective teacher efficacy.

Based on the results of previous research (Chen & Usher, 2013; Klassen & Tze, 2014; Olsen & Huang, 2019; Q. Zheng et al., 2017), the following hypotheses were formed:

Hypothesis 1. Promotion of teachers to a higher rank is the most influential source of teacher self-efficacy.

Hypothesis 2. Principal support is the most influential source of collective teacher efficacy.

*Sample and Data Collection*

In the study, a non-probability purposive sample was used, which included 761 teachers working in compulsory primary schools in all parts of the Republic of Croatia. In the Republic of Croatia, primary school lasts 8 years; Grades 1-4 are taught by classroom teachers (Primary education, ISCED Level 1), while Grades 5-8 are taught by subject teachers (Lower secondary education, ISCED Level 2). In terms of gender, 93.3% of the respondents were females, while 6.7% were males. The respondents' age was in the range between 24 and 65 years. In terms of position, 35.2% of the respondents were primary education teachers, while 64.8% were lower secondary education teachers. 74.8% of the respondents have not been promoted to a higher rank, while 25.2% of the respondents have been promoted to the ranks of mentors, advisors and excellent advisors. The data were collected online, via social networks created for teachers. Before filling out the questionnaire, the respondents were informed about the aim of the study and their informed consent was obtained.

The first part of the administered online questionnaire provided data on the respondents' gender, age, years of work experience, workplace, education level and county. The second part of the questionnaire measured principal support, teacher self-efficacy and collective teacher efficacy. The respondents expressed their agreement with the provided items on a 5-point Likert-type scale – 1 meaning *I totally disagree* and 5 meaning *I totally agree*. It took about 10-15 minutes to fill out the questionnaire.

The questionnaire *The Teacher Sense of Teacher Efficacy Scale* has already been used in Croatia in a study carried out by T. Vidić and Miljković (2019), while the questionnaires *The Principal Support Scale* and *The Collective Teacher Efficacy Scale* were translated into Croatian language for the purpose of this research, using the translation-back translation method. To confirm the clarity, reliability and validity of the translated questionnaires, a pilot study was carried out involving 50 respondents. After the analysis of the pilot study, satisfactory results were obtained and the main research was carried out.

*The Principal Support Scale:* The questionnaire was developed by DiPaola (2012). The original scale contains 16 items (item example: *My principal trusts my judgment in making classroom decisions.*). The original scale also consists of 2 subscales, but after performing exploratory factor analysis using the principal components method with orthogonal (varimax) rotation (KMO = .961; Bartlett's test of sphericity $\chi^2$df120 = 14767.70; p = .000), a single-factor structure was obtained, explaining 72.15% of the principal support variance. The Cronbach's alpha coefficient for the scale was reported as $\alpha$ = .974.

*The Teacher Sense of Teacher Efficacy Scale:* The scale was developed by Tschannen-Moran and Hoy (2001). The original scale consists of 12 items (item example: *How much can you do to control disruptive behavior in the classroom?*) and 3 subscales. After performing the exploratory factor analysis using the principal components method with orthogonal (varimax) rotation (*KMO* = .897; Bartlett's test of sphericity $\chi^2_{df66}$ = 3980.370; $p$ = .000), a two-factor structure was obtained, explaining 57.38% of the self-efficacy variance. The first factor (classroom management) has a Cronbach α reliability coefficient α = .872, and the second factor (engagement & efficacy) α = .848. The calculated Cronbach α reliability coefficient for the entire scale is α = .88.

*The Collective Teacher Efficacy Scale (CTES):* This scale was designed by R. D. Goddard et al. (2000) and R. Goddard (2002). A shortened questionnaire, The Collective Teacher Efficacy Scale, was used. The original scale has a 2-factor structure and it consists of 12 items (item example: *Teachers in this school truly believe every child can learn.*). After the performed exploratory factor analysis using the principal components method with orthogonal (varimax) rotation (*KMO* = .831; Bartlett's test of sphericity $\chi^2_{df36}$ = 2343.383; $p$ = .000), a single-factor structure was obtained, explaining 58.91% of the collective efficacy variance. Three items had saturation lower than 0.40 and were therefore excluded from further analysis. The calculated Cronbach α reliability coefficient is α = .76.

Since we used three measuring instruments simultaneously, method bias might have occurred, so we performed Herman's test to verify its presence. The results show that a one-factor solution is inadequate, and the model does not fit a single factor (the total explained variance is 24.9%), suggesting that there is no method bias.

*Data Analysis*

Statistical software SPSS 18 was used for the analysis of the obtained results. Exploratory factor analyses were performed to examine the factor structure of each questionnaire, and reliability coefficients for the scales were calculated. The scales were analyzed using descriptive statistics. Normality of distributions was checked, and it was determined that parametric statistics could be applied in further analyses. Correlations among variables were found to be suitable for regression analyses, and two hierarchical regression analyses were conducted to check the impact of demographic variables and principal support on teacher self-efficacy and collective teacher efficacy. Additionally, Herman's one-factor test was used to check for method bias.

## Results

*Demographic Characteristics*

Table 1 shows the descriptive parameters for all of the examined variables. The respondents show the highest level of the perceived self-efficacy, somewhat lower level of the perceived principal support, while the perceived level of collective teacher efficacy is the lowest one. The Kolmogorov-Smirnov test reveals considerable deviations from normal distribution in the results distributions of all utilized scales. However, these scales exhibit acceptable levels of skewness and kurtosis as indicated by satisfactory indices (Kline, 2011). This supports the use of parametric statistical methods for subsequent analyses.

*Table 1. Descriptive Statistics (N = 761)*

| | M | SD | Min | Max | Kolmogorov-Smirnov d index | Skew | Kurt |
|---|---|---|---|---|---|---|---|
| **Principal support** | 3.50 | 1.13 | 1.00 | 5.00 | .093* | -0.383 | -0.932 |
| **Self-efficacy (SE)** | 4.20 | 0.41 | 2.92 | 5.00 | .084* | -0.040 | -0.044 |
| SE classroom management | 4.26 | 0.52 | 2.50 | 5.00 | .186* | -0.239 | -0.200 |
| SE engagement & instructions | 4.16 | 0.67 | 1.50 | 5.00 | .111* | -0.005 | -0.227 |
| **Collective Efficacy (CE)** | 3.32 | 0.59 | 1.44 | 5.00 | .051* | -0.123 | 0.032 |

To examine how demographic variables and principal support can help explain self-efficacy and collective teacher efficacy, two hierarchical regression analyses were conducted. Prior to performing regression analyses, the connections between the variables were examined. It was found that all correlations, although significant at a level of risk of 1%, demonstrated either weak or moderate strengths. This characteristic rendered them appropriate for inclusion in the regression analyses. The results indicate that although not all the variables were normally distributed, the distributions were neither bimodal nor U-distributions, and were mostly symmetrical. The unexplained part of the variance criteria (residuals) is distributed according to the normal distribution. The Durbin-Watson test yielded a value of 1.906, indicating proximity to the ideal value of 2 and thus not suggesting the presence of multicollinearity. This observation was corroborated by the Variance Inflation Factor (VIF) values, which ranged from 1.000 to 1.002, all comfortably below 4.

The first regression analysis was conducted to examine how demographic variables and principal support can help explain self-efficacy. In the first step, the following demographic variables were added: gender, age, years of work experience, workplace, education level, the total number of students in a school, an average number of students per class, and promotion to a higher rank. In the second step, the principal support dimension was added.

Displayed in Table 2 are the results of the regression analysis. These results reveal a regression coefficient of 0.280, representing approximately 7.8% of the accounted for variance in self-efficacy, as determined by the incorporated predictors.

*Table 2. Contribution of the Principal Support Factor to the Explanation of Self-Efficacy*

| | $\Delta R^2$ | β | t | *p* |
|---|---|---|---|---|
| **1 – demographic factors** | | | | |
| Gender | | Excluded variable | | |
| Age | | Excluded variable | | |
| Years of work experience in school | | Excluded variable | | |
| Workplace | | -.113 | -3.197 | .001** |
| Education level | | Excluded variable | | |
| The total number of students in a school | | Excluded variable | | |
| An average number of students per class | | Excluded variable | | |
| Promotion to a higher rank | | .204 | 5.780 | .000** |
| | $R = 0.237$; $R^2 = 0.056$; Adjusted $R^2 = 0.054$; $\Delta F_{(2/758)} = 22.494$; $p < 0.01$ | | | |
| **2 – Principal support** | **.022**** | | | |
| | | .149 | 4.262 | .000** |
| | $R = 0.280$; $R^2 = 0.078$; Adjusted $R^2 = 0.074$; $\Delta F_{(1/757)} = 18.161$; $p < 0.01$ | | | |

*Note: R* - multiple correlation coefficient; $R^2$ - coefficient of multiple determination; $\Delta R^2$ - a change in the coefficient of multiple determination; * $p < .05$; ** $p < .01$.

The results show that workplace and promotion to a higher rank have a predictive value, but other variables do not. As a result, they were omitted from the regression analysis. The overall accounted for variation amounts to 5.6%, with statistical significance. Notably, a statistically significant regression coefficient was derived for the workplace variable, elucidating 1.4% of the variability in self-efficacy, as well as for advancement to a higher rank, elucidating 4.2% of the self-efficacy's variance. Workplace is negatively related to self-efficacy, while promotion to a higher rank is positively related to self-efficacy. Promotion to a higher rank leads to a higher level of perceived self-efficacy. In terms of workplace, primary education teachers tend to have a higher level of perceived self-efficacy than is the case with lower secondary education teachers.

In the second step, the results obtained for the principal support dimension were added to the analysis, which helped explain 7.8% of the self-efficacy variance. The obtained increase in the regression coefficient of 2.2% is statistically significant, which means that principal support is a statistically significant predictor. From the correlation we can see that the increase in the results for principal support influences the increase in the results for self-efficacy. Additional analyses show that the explained ratio of variance from the previous step remains almost the same: 1.4% of the self-efficacy variance is explained with workplace, 4.3% with promotion to a higher rank, while 2.1% is explained with principal support.

The second objective of the study involved assessing how demographic variables, principal support, and teacher self-efficacy contribute to the explanation of collective teacher efficacy. To achieve this, a three-step hierarchical regression analysis was performed (see Table 3). The results of this analysis reveal a regression coefficient of 0.555, signifying that the included predictors account for approximately 30.8% of the variance in collective efficacy.

*Table 3. Contribution of the Principal Support Self-Efficacy Factors to the Explanation of Collective Efficacy*

| | $\Delta R^2$ | β | t | *p* |
|---|---|---|---|---|
| **1 – demographic factors** | | | | |
| Gender | | Excluded variable | | |
| Age | | Excluded variable | | |
| Years of work experience in school | | Excluded variable | | |
| Workplace | | Excluded variable | | |
| Education level | | Excluded variable | | |
| The total number of students in a school | | Excluded variable | | |
| An average number of students per class | | .136 | 3.774 | .000** |
| Promotion to a higher rank | | -.075 | -2.086 | .037 |
| | $R = .152$; $R^2 = .023$; Adjusted $R^2 = 0.021$; $\Delta F_{(2/758)} = 8.994$; $p < .01$ | | | |

*Table 3. Continued*

| | $\Delta R^2$ | β | t | *p* |
|---|---|---|---|---|
| **2 – Principal support** | **.247**** | | | |
| | | .498 | 16.007 | .000** |
| | R = .520; $R^2$= .270; Adjusted $R^2$ = 0.267; $\Delta F(1/757)$ = 256.213; p < .01 | | | |
| **3 – Self-efficacy** | **.037*** | | | |
| Class management | | -.010 | -.267 | .790 |
| Teacher engagement and teaching strategies | | .206 | 5.593 | .000** |
| | R = .555; $R^2$= .308; Adjusted $R^2$ = .303; $\Delta F_{(2/755)}$ = 20.436; $p$ < .01 | | | |

*Note.* R – multiple correlation coefficient; $R^2$ - coefficient of multiple determination; $\Delta R^2$ - change in the coefficient of multiple determination; * $p < 0.05$; ** $p < 0.01$.

During the initial stage, the predictive relevance was observed in terms of the average number of students per class and promotion to a higher rank, leading to the exclusion of other variables from the regression analysis. The overall accounted for variance amounts to 2.3%, bearing statistical significance. Notably, a statistically significant regression coefficient was found for the average number of students per class, elucidating 1.8% of the variance in collective efficacy, in addition to promotion to a higher rank, which accounted for 0.5% of the variance in collective efficacy. An average number of students per class is positively related to collective efficacy, while promotion to a higher rank is negatively related to collective efficacy. A rise in the average class size corresponds to a rise in the perceived level of collective efficacy. Conversely, an increase in promotion to a higher rank corresponds to a decrease in the observed collective efficacy results.

In the second step, the result for the principal support dimension was added to the analysis, which helped explain 27.0% of the collective efficacy variance. The obtained increase in the regression coefficient of 24.7% is statistically significant, and principal support can be seen as a statistically significant predictor. The results indicate that an increase in the results for principal support leads to an increase in the result for collective efficacy. Additional analyses show that the explained ratios of variance from the previous step remain almost the same: 2.2% of the variance can be explained with an average number of students per class, 0.4% of the variance can be explained with promotion to a higher rank, while 24.4% of the variance can be explained with principal support. In the third step, the self-efficacy dimensions were introduced, resulting in a subsequent increase of 3.8% in the accounted for variance. Still, the only statistically significant dimension is teacher engagement and teaching strategies. Again, based on the relationships between the variables, we can detect a positive relationship, that is, if the results for the teacher engagement and teaching strategies variable increase, the result for collective efficacy increases as well. Additional analyses indicate that with this step, the ratio of the explained variance with the variables from the previous step remains similar: 2.2% of the variance can be explained with an average number of students per class, 0.7% can be explained with promotion to a higher rank and 22.4% with principal support. Teacher engagement and teaching strategies explain 5.5% of the collective efficacy variance.

To summarize, the results of the initial regression analysis indicate that promotion to a higher rank emerges as the most powerful predictor of teacher self-efficacy. Meanwhile, the findings from the subsequent regression analysis underscore that principal support stands out as the predominant factor influencing collective teacher efficacy. Therefore, Hypotheses 1 and 2 were supported.

## Discussion

The current study aimed to examine how much demographic variables, principal support, and teacher self-efficacy contribute to collective teacher efficacy. As the results indicate, among the examined scales, The Self-efficacy Scale ($M$ = 4.20; $SD$ = 0.41) had the highest perceived level, then The Principal Support Scale ($M$ = 3.50; $SD$ = 1.13), while the lowest perceived level was determined for The Collective Efficacy Scale ($M$ = 3.32; $SD$ = 0.59) (Table 1). It is important to mention that the standard deviation was highest for the perceived principal support, which points to a great dispersion in the respondents' perceptions. Those teachers who perceive their self-efficacy as high tend to use various teaching strategies more efficiently, seem to be more dedicated to their profession, and experience less burnout at work (Zee & Kooman, 2016). In the educational context, it is significant both for the teachers and the students they teach.

The results of the hierarchical regression analysis show that among all sociodemographic variables, only workplace and promotion to a higher rank contribute to the explanation of teacher self-efficacy. Primary education teachers seem to believe they have more self-efficacy than lower secondary education teachers. A possible explanation for that may be that considering the age of students, it is probably easier to work and achieve the planned educational outcomes with younger students. Students taught by lower secondary education teachers are in a pre-adolescent phase, so it is more demanding to work with them. Therefore, their teachers tend to have a lower level of perceived self-efficacy.

An increase in promotion to a higher rank leads to a higher level of perceived self-efficacy, which is not surprising. Bandura (1997) emphasizes four sources of self-efficacy, the first of which is mastery experience, which refers to a sense of satisfaction with one's past teaching success. The teachers who have been promoted to a higher rank have been achieving extraordinary results over a longer time period. Therefore, it is not surprising that they express their work

success through a higher level of perceived self-efficacy. The results are in line with previously conducted research which confirmed that mastery experiences are a powerful, the most influential factor of self-efficacy (Bandura, 1997; Chen & Usher, 2013; Usher & Pajares, 2008).

The obtained results are similar to the results of research carried out by Aaronson et al. (2007), who determined that numerous sociodemographic characteristics of teachers (e.g., race, gender, etc.) explain less than 8% of teaching effectiveness, while the total explained variance in our study was 5.6%. Klassen and Chiu (2010) found that there are two key variables which might explain teacher efficacy, and they are gender and work experience, which is different from our findings. Podolsky et al. (2019) also point out the importance of work experience, claiming that it has significant influence on teachers' sense of self-efficacy.

Frequently, teacher self-efficacy is related to principal support. According to the results of this study, principal support is a statistically significant predictor of teacher self-efficacy. School is an institution with a hierarchical organization in which principals are teachers' superiors, and it is therefore important what kind of feedback they provide to teachers. It is obvious that principals provide positive feedback to teachers and in this way support their beliefs that they conduct the teaching process in a quality and professional manner, and that they achieve the planned outcomes. Hattie and Timperley (2007) claim that feedback can be twofold (positive or negative) and that it is one of the most powerful influences on learnings and achievements. If feedback is negative, it can undermine self-efficacy.

When explaining collective efficacy, out of all sociodemographic variables, the number of students per class and promotion to a higher rank have a predictive value. Teachers who have more students in their classes tend to show a higher level of perceived collective efficacy. Possible explanations might be that it is more difficult to manage larger classes, the organization of the teaching process is more demanding, and teachers are more willing to help each other and to collaborate. Such synergy of teachers' efforts and actions probably results in a feeling of togetherness in the successful achievement of the set outcomes. Furthermore, the results point to a negative relationship between promotion to a higher rank and collective efficacy. The teachers who have been promoted throughout the years of their work experience are probably more ambitious and prone to autonomous activities. Their expectations might be higher, they think more critically about the educational theory and practice, and they rely more on themselves than on their colleagues. It has already been mentioned that the results indicate that promotion to a higher rank is positively related to teacher self-efficacy, and it is highly probable that teachers who belong to this category are more prone to individual actions and less likely to act within their collective. Skaalvik and Skaalvik (2019) point out that individual teacher self-efficacy and collective teacher efficacy should be differentiated since some teachers may have high efficacy beliefs about their teaching and low beliefs about the abilities of the teacher collegium in their school.

Principal support has a positive influence both on student achievement (Robinson et al., 2008; Sebastian et al., 2017) and on teacher collaboration (R. Goddard et al., 2015). Our findings indicate that principal support makes the most important contribution to predicting collective teacher efficacy; as principal support increases, so does collective efficacy. This might be due to the fact that principals are expected to unite teachers in their joint efforts, to bring them closer, to encourage them to solve problems together and to develop their interpersonal relationships. In this way, teachers start perceiving themselves as a group of well-connected and efficient professionals. Moreover, this corresponds with the studies that indicate a statistically significant relationship between school leadership and collective teacher efficacy (Çalik et al., 2012; Q. Zheng et al., 2017). Çoban et al. (2023) also point out that teachers' sense of self-efficacy and collective efficacy can be significantly influenced by their trust in the principal and principal support.

Our results suggest that an increase in the results for the teacher engagement and teaching strategies variable leads to an increase in the collective efficacy results. It is not surprising, considering that greater teacher engagement and usage of more active teaching strategies imply an exchange of ideas, common activities, and reflection on contemporary teaching approaches with colleagues, which results in a higher level of perceived collective efficacy. A higher level of teacher self-efficacy and collective efficacy is positively related to student achievements (Ryan & Hendry, 2023), while academic self-efficacy is a variable that is a significant predictor of student satisfaction and happiness in their schools (Döş, 2023), which is the goal all educational institutions in the world aim to achieve.

## Conclusion

This study highlights the importance of the relationship between principal support, teacher self-efficacy and collective teacher efficacy. According to the obtained results, some of the sociodemographic variables did not have predictive values in explaining self-efficacy of teachers and collective efficacy (e.g., gender, age, years of work experience in school, education level and the total number of students in school). A reason for that might be the composition of the sample (e.g., only 6.7% of the respondents were males). At the same time, the results of this study indicate that some sociodemographic variables, principal support, teacher engagement and strategies contribute to collective teacher efficacy.

In both regression analyses, promotion to a higher rank and principal support had a predictive value in explaining teacher self-efficacy and collective teacher efficacy. In order for teachers to be more efficient both as individuals and as members of the collective, it is necessary to pay additional attention to their promotion to a higher rank and to the support they

receive from their principals. Schools should be places which employ teachers with high self-efficacy and collective efficacy beliefs. These teachers have a beneficial impact not only on their own well-being, but on the well-being of their students, parents, and the entire community. Principal support has shown to be the most significant predictor of collective teacher efficacy, therefore special efforts should be made to strengthen the competencies of principals for successful school management.

## Recommendations

The results of this study might be a starting point for the creators of education policies on how to include quality preparation for school principals and encourage promotion of teachers to higher ranks in the education system development strategies. Furthermore, school principals could use these results to manage human resources in their schools more efficiently. At the seminars and conferences for school principals, more attention should be paid to promotion of teachers to higher ranks, in order for teachers to became more aware of the importance of their professional development and excellence in their teaching practice. This study should be taken as an incentive to carry out research on interaction between the mentioned (and other) dimensions in the future, in order to obtain new information, to create an opportunity to compare the results and to improve the education system.

## Limitations

It should also be mentioned that there are some limitations to this study. This study collected only quantitative data, so additional studies could apply a qualitative approach. This could offer a complete insight into the topic and lead to a better understanding of observation of teachers during the teaching process, interviews, and self-reports. By all means, the obtained data rely on the participants' own perceptions and the validity of their perceptions depends on how accurate and honest they were. Apart from that, the limitations include the fact that we cannot be completely confident how the respondents interpreted the items of the questionnaire. In future studies, some other variables (for example, collaboration with and support received by students and parents) could be taken into account in order to obtain a more comprehensive insight. In future studies, it would be wise to immediately create a plan of research that will reduce the likelihood of method bias, primarily through temporal separation of scale completion and increased anonymity of the respondents.

## Authorship Contribution Statement

Đuranović: Conceptualization, drafting manuscript, statistical analysis, supervision, critical revision of manuscript. Klasnić: Drafting manuscript, data interpretation, statistical analysis, critical revision of manuscript, final approval. Vidić: Data acquisition, data analysis, drafting manuscript, critical revision of manuscript, final approval.

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