

## Institute for Social Research in Zagreb Repository

This is an Accepted Manuscript of an article published by Sage in European Educational Research Journal on January 30, 2026, available at:  
<https://doi.org/10.1177/14749041251415077>.

Baranović, B., & Šabić, J. (2026). Students' self-efficacy for higher education: Intersectionality of gender, place of residence, cultural and economic capital. *European Educational Research Journal*, 25(5), 801-818.  
<https://doi.org/10.1177/14749041251415077>

Reuse is restricted to non-commercial and no derivative uses.

Online-publication

<https://journals.sagepub.com/eprint/E2TVUVRWEBM7H8FMFNS/full>

DOI: 10.1177/14749041251415077

## **Students' self-efficacy for higher education: intersectionality of gender, place of residence, cultural and economic capital**

### **Abstract**

Achieving gender equality in self-efficacy for higher education (HE) is essential for meeting Europe's strategic goals of increasing access to HE and narrowing gender disparities. Our study examines gender disparities in self-efficacy for pursuing HE, including intersecting influences of gender, cultural capital, economic capital and residential location.

Building on Bandura's concept of self-efficacy and its application in research, we define self-efficacy for HE as a student's confidence in their ability to successfully carry out the necessary tasks for enrolment and completion of their desired study program and as a concept that reflects complex intersectional inequalities influenced by both individual and social factors across various societal contexts. We employed a quantitative intersectional approach grounded in McCall's multicategorical complexity framework. The study was conducted with a nationally representative sample of Croatian upper secondary school students in 2021. The findings revealed that urban residence, along with higher cultural and economic capital, significantly influenced self-efficacy for HE.

Boys demonstrated slightly higher self-efficacy than girls. Cultural capital exerted a slightly stronger impact among male students and among students from rural areas. The study is discussed in the context of its contribution to quantitative intersectional research and policies aimed at addressing gender inequalities in HE in Europe.

**Key Words:** intersectionality; self-efficacy for higher education; gender differences; residential location; cultural and economic capital

## **Introduction**

The European strategy focuses on fostering a greener and more digital Europe, highlighting the need to increase the number of individuals with higher education (HE) qualifications, especially in STEM fields (European Council, 2024), which remain male-dominated. This process also applies to Croatia, which as a member state of the European Union (EU), follows the European strategic objectives. The EU recognizes the importance of quality education as a key factor for adapting the workforce to new challenges (European Commission, 2023a). The digital and green transition demands experts with advanced digital and STEM competences (European Commission: Directorate-General for Employment, Social Affairs and Inclusion, 2020) and heightens the demand for highly educated professionals in environmental fields and sustainable development (European Commission: Directorate-General for Communication, 2019). Increasing HE participation is therefore becoming an important strategy: HE institutions are the places where deeper digital and green competences can be developed (beyond basic skills). The EU target is that by 2030 at least 45% of 25-34-year-olds should hold

a tertiary qualification (European Commission, 2025b). In Croatia, where the challenges of economic and skills transformation are particularly pronounced, the need for an educated workforce is growing to effectively respond to these changes (Croatian Strategy for Education, Science and Technology, 2021). According to the Education and Training Monitor (European Commission, 2025a), 38.8% of 25–34-year-olds in 2023 had completed HE, which is for 3.3 percentage points more than in 2022, but still below the EU average of 43.1 and EU targets of 45%. Both digital and green transition emphasize the importance of STEM qualifications where women are still underrepresented. At the EU level, 35% of HE graduates hold degrees in STEM fields - around 40% of men and 30% of women. In Croatia, approximately 30% of graduates have STEM degrees, including 35% of men and 25% of women (Eurostat, 2022; OECD, 2023). These developments highlight the importance of prioritizing the challenge of rising student enrollment in HE (European Council, 2024; Symeonidis, 2021) and tackling gender disparities in specific fields, such as STEM (EIGE, 2023; Eurostat, 2023), where greater support for girls is essential.

Studies point out that self-efficacy plays an essential role in making an individual's decision to attend HE (Van Rooij et al., 2017). Self-efficacy is crucial for individuals to successfully adapt to and cope with life's changes and challenges such as transition to HE. Students with high self-efficacy tend to “experience less stress in demanding situations” and “adapt better” to new educational contexts (Van Rooij et al., 2017:537).

Our study explores gender differences in self-efficacy of upper secondary students for pursuing HE. We defined self-efficacy for pursuing HE as students' confidence in their ability to enroll in and successfully complete their chosen degree program. We also

understand self-efficacy as a concept encompassing complex intersectional inequalities influenced by both individual and social characteristics of individuals living in diverse societal contexts. More precisely, in addition to the individual characteristics such as academic performance, self-efficacy for continuing education is also shaped by various contextual inequalities, such as socio-economic and cultural backgrounds, rural or urban surroundings, and access to employment opportunities. These factors often create compounded disadvantages, limiting life opportunities for disadvantaged students, including girls.

Such an understanding of self-efficacy highlights the importance of using an intersectional approach in analysis of gender inequalities in self-efficacy for pursuing HE. Namely, intersectional approach provides a framework for understanding gender as a category that is simultaneously influenced by multiple inequalities, which stem from individual and social differences, rather than considering the impact of these inequalities independently (Bauer et al., 2021). In our analysis, we are trying to examine gender differences in self-efficacy for HE and the intersection of gender, economic and cultural capital as well as residential location of students in shaping students' self-efficacy for HE. Intersectionality has traditionally been used in qualitative research. However, the past two decades have seen a significant increase in quantitative research employing intersectionality as a research framework (Bauer et al., 2021), facilitated with development of complex advanced statistical analysis such as regression analysis and multilevel modelling. These methods provide powerful tools for uncovering the nuanced effects of intersecting inequalities by incorporating interaction terms and multiple levels of data analysis. In our study, we apply a quantitative intersectionality approach using

McCall's multicategorical complexity framework (2005), focusing on both intercategorical and intracategorical approaches, which will be detailed in the theoretical framework and methodological approach section.

We see this methodological approach as a contribution to advancing quantitative intersectional research within the European context, where intersectionality has predominantly been examined through qualitative methods, and within the Croatian context, where such perspectives remain largely underexplored.

The research that we present in this paper was conducted in 2021, during the COVID-19 pandemic. Despite the significance of the topic, research on student self-efficacy during the pandemic remains limited and produces inconsistent findings, particularly regarding gender differences. Some studies indicate that male students demonstrate higher academic self-efficacy than their female counterparts (Alemany-Arrebola et al., 2020; Lane, 2023; Gousia and Maqbool, 2022), while others find no substantial gender differences (Kurniawan et al., 2021; Prihandono et al., 2021). When it comes to Croatia, the research indicate that girls reported a greater sense of deprivation regarding education quality compared to boys during the pandemic (Ristić Dedić and Jokić, 2021). To our best knowledge there is no research in Croatia on gender differences in students' self-efficacy conducted during that period.

Our research attempted to answer two main questions: (1) are there gender differences in self-efficacy for pursuing HE after accounting for the effects of cultural and economic capital and residential location, and (2) does the intersection/interaction of these

categories affect self-efficacy for HE? The research questions will be described in detail in the section on aims, research questions and hypotheses. We hope that our research, by addressing these research questions, will fill a gap in the research on gender differences in students' self-efficacy in the Croatian and wider European research context, where this topic has been neglected despite its strategic relevance for the development of EU countries, including Croatia. We also believe that our research, by applying a quantitative intersectional approach, can provide a more comprehensive understanding of gender differences in students' self-efficacy for HE and thus support the creation of cross-sectoral, integrated strategies for identifying gender gaps and proposing effective, synergistic interventions for advancing gender equality in education, particularly in STEM fields where women are still underrepresented.

In addition to the introduction, this paper includes: (1) an overview of studies relevant to gender differences in self-efficacy for HE and the application of a quantitative intersectional approach; (2) a discussion of the theoretical foundations of self-efficacy based on Bandura's social cognitive theory, along with an explanation of the methodological framework grounded in McCall's concept of multicategorical complexity; (3) a description of the study's objectives, research questions, hypotheses, operationalization of key concepts/measures, sample, and research procedures; (4) presentation of the statistical analyses, including descriptive statistics, bivariate analyses, and multilevel regression modeling with random intercepts, together with the main results; (5) discussion of these findings in relation to the research questions, hypotheses, and relevant literature; and (6) a concluding section summarizing the key findings, their implications for Croatian and European research contexts, and strategies

for promoting gender equality in education, followed by reflections on the study's limitations and suggestions for future research.

## **Research review**

In this section, we examine studies exploring gender differences in self-efficacy for pursuing HE, with particular attention to studies employing a quantitative intersectional approach and focusing on the categories relevant to our research. The majority of the reviewed studies do not explicitly discuss their application of an intersectional framework, and the explicit use of intersectionality remains rare. Codioli McMaster and Cook (2019:6) argue in their review of quantitative intersectionality studies that, “whether or not they explicitly use intersectionality theory” they “contribute to an intersectional understanding of educational inequality.”

Studies emphasize that self-efficacy is influenced by a range of individual and social factors, such as gender, economic and cultural resources, living environment, and mental health. The documented differences in self-efficacy both between and within social groups make a strong case for the importance of studying gender and self-efficacy intersectionally. Applying an intersectional approach sheds more light on the interplay or interaction of different individual and social categories that shape inequalities in self-efficacy.

In the field of education, studies on students' self-efficacy emphasize its pivotal role in achieving academic success and overcoming educational and life challenges (McKechnie, 2012; Van Rooij et al., 2017; Talsma et al., 2021). Dutch researchers Van Rooij et al. (2017: 537-538) found that highly self-efficacious students adapt more effectively to new learning environments - an essential factor in transitions such as moving from secondary school to HE. Some studies (McKechnie, 2012; Prihandono et al., 2021) highlight the connections between self-efficacy and individual characteristics of students (motivation, achievement goal), while overlooking its relationships with social categories. Inclusion of social categories could contribute to a deeper knowledge of intersectional inequalities in self-efficacy.

As the following studies demonstrate, the analysis of relationships of self-efficacy and factors such as socio-economic status and parental education reveals an important dimension of educational inequality: economically and culturally disadvantaged students feel less confident in their ability to successfully pursue HE. For instance, Saadat and Sultana (2023) and Hamel (2014) show that students from low-income families tend to have lower self-efficacy for education, including pursuing HE, making them less likely to continue their studies compared to peers from wealthier backgrounds. Fuentes-Tauber (2018) confirms a positive relationship between students' socio-economic status and their self-efficacy for HE, further highlighting the significant influence of economic resources on educational aspirations and outcomes. The relationship between self-efficacy and individual as well as social categories can be highly context-specific. Researchers have also incorporated other factors alongside family economic and cultural resources, such as ethnicity, thus enriching the intersectional analysis of

inequalities in self-efficacy. For example, Rucinski (2021) found that American Hispanic upper secondary school students whose parents did not complete high school exhibited significantly lower self-efficacy for HE compared to those whose parents had earned a HE degree. In the European context, Van Rooij et al. (2017) examined Dutch upper secondary school students and found that those whose parents held university degrees exhibited greater self-efficacy for academic success at the university level compared to students whose parents did not have HE. In Croatia, a quantitative intersectional study examined gender differences in self-efficacy for pursuing HE among upper secondary students. The results indicated that boys reported slightly higher levels of self-efficacy than girls. Male gender, higher grade point average (GPA), and enrollment in a gymnasium program (as opposed to a vocational program) were significant predictors of self-efficacy. In contrast, cultural capital, economic capital, and residential environment did not exert statistically significant effects on self-efficacy (Šabić and Baranović, 2022).

The pandemic emphasized the connection between students' self-efficacy and mental health, particularly in relation to heightened stress, anxiety, and depression, which had a significant impact on their self-efficacy (Alemany-Arrebola et al., 2020; Gousia and Maqbool, 2022; Lane, 2023). However, research exploring gender differences in self-efficacy remains limited and has produced inconsistent results. Alemany-Arrebola et al. (2020), in their study on the relationship between anxiety and academic self-efficacy among college students at a Spanish university, found that male students demonstrated greater self-efficacy, whereas female students reported experiencing higher levels of anxiety. Lane (2023) found that, during the pandemic, university students in New Mexico reported high self-efficacy for graduation but lower confidence in completing

coursework. Nevertheless, male students scored significantly higher in self-efficacy for successfully completing college coursework compared to female students. Similarly, Mittal (2021) found that male students exhibited higher self-efficacy than female students in his study of Indian students during the pandemic. In their research on Kashmiri college students, Gousia and Maqbool (2022) observed notable gender differences in self-efficacy, with males showing higher levels, while most students fell within the average self-efficacy range. In contrast, Kurniawan et al. (2021) studied gender differences in self-efficacy among Indonesian HE students participating in e-learning during the pandemic and found no significant gender-based impact on self-efficacy. Similarly, Malespina and Singh (2024) found no significant gender differences in self-efficacy regarding exams among university students in the USA. Prihandono et al. (2021) explored gender differences in motivation among Indonesian upper secondary students studying English online and found no significant differences in self-efficacy between male and female students.

The inconsistency in empirical findings concerning gender differences in self-efficacy indicates that such disparities are contingent upon specific learning settings and national contexts during the pandemic, thereby underscoring their context-dependent character. Furthermore, although the aforementioned studies describe gender-based variations in self-efficacy across diverse learning settings, they fall short of investigating the extent to which these differences are associated with students' background characteristics or assessing the magnitude of gender disparities in self-efficacy during the pandemic relative to pre-pandemic periods. However, the pandemic and the accompanying containment measures—particularly school closures that prompted a

shift to remote and home-based learning—significantly increased students' dependence on family resources and parents' ability to provide educational support. This shift underscores the importance of examining the roles of economic and cultural capital, alongside residential location, in shaping differences in educational outcomes and aspirations.

Although our research does not aim to examine the extent of gender differences attributable to the pandemic relative to the pre-pandemic period, we believe that focusing on the intersectional effects of economic capital, cultural capital, and students' place of residence on gender differences in self-efficacy for HE within the Croatian context offers a valuable contribution to a more comprehensive understanding of gender differences in self-efficacy.

### **Theoretical framework and methodological approach**

In our study, self-efficacy for HE is conceptualized as an outcome variable, as we aim to explore gender differences in self-efficacy for HE, including intersectional effect of gender, cultural capital, economic capital and residential location. The construct of self-efficacy is most commonly grounded in Bandura's (1997) social cognitive theory, which defines it as an individual's belief in their capability to organize and execute the actions required to achieve specific performance outcomes.

Two key principles of social cognitive theory, as proposed by Bandura (1986, 1997), are relevant to our exploration of self-efficacy for HE. The first principle asserts that human

achievement is the result of the interaction between individual behavior, personal characteristics, and environmental conditions. The second principle emphasizes that self-efficacy is multidimensional, meaning that our beliefs about our abilities are not universal but vary depending on the specific task or domain. Building on Bandura's theory, McKechnie (2012) highlighted the importance of identifying the specific domain of self-efficacy when measuring domain-specific beliefs, outlining the tasks involved and the situational circumstances where those abilities are applied. In our study, the focus is on self-efficacy for pursuing HE, particularly for students in the final years of upper secondary school.

Thus, we define self-efficacy for pursuing HE as a student's confidence in their ability to successfully carry out the necessary tasks for enrolment and completion of their chosen study program, specifically applied to students in the final grades of upper secondary education.

Since we consider self-efficacy to be a category shaped by complex intersectional inequalities arising from the interconnected effects of various individual traits and social positions, we adopt an intersectional perspective through a quantitative intersectional approach. It is important to highlight that recent developments in statistical methods, such as regression analysis and multilevel modelling, have significantly contributed to enhancing and expanding the use of quantitative approaches in intersectionality research (Bauer et al., 2021). Scholars in quantitative intersectionality emphasize that these advanced techniques enable explicit testing of whether the impact of one variable (e.g., gender in our research) varies based on the level of another variable (e.g., cultural capital), thereby allowing for a precise statistical representation of intersectional

dynamics. This approach represents a notable improvement over additive methods, which consider variables independently and assume that combined effects can be understood as the sum of individual effects. Incorporating interaction terms into regression models enables the examination of joint effects among multiple predictors. By incorporating additional covariates (e.g., GPA and upper secondary school program), researchers can distinguish the unique effects of intersecting categories and strengthen the accuracy of their findings.

As previously mentioned, in our quantitative intersectional analysis we apply McCall's (2005) multicategorical complexity framework, incorporating multigroup and comparative analysis. In doing so, we focus on both intercategorical and intracategorical approaches. This approach allows us to examine how various factors influencing gender differences in self-efficacy interact and jointly shape students' self-efficacy in pursuing HE. Thus, we examine the mutual interaction and joint effects of all categories and their constituent groups. The first category, gender, includes girls and boys. The second category, which consist of economic and cultural capital, is divided into two groups for each type of capital (low and high economic capital, and low and high cultural capital). The third category, residential location, distinguishes between students from rural and urban areas.

Economic and cultural capital were conceptualized based on Bourdieu's theory of capitals (1977). Cultural capital was examined in two forms: objectified (ownership of books) and institutional cultural capital (parental educational qualifications) (Šabić and Baranović, 2022). Residential environment (location), categorized as urban or rural, was determined based on students' self-reported living location.

The Croatian upper secondary education system consists of gymnasiums and various three-year and four-year vocational schools. Our study focuses on students attending gymnasiums and four-year vocational schools. Gymnasiums provide a broad general education aimed at preparing students for HE, while four-year vocational schools are designed to prepare students for the labor market, with the option to pursue HE afterward.

### **Aim, research questions and hypotheses**

The aim of this study is to examine gender differences in upper secondary students' self-efficacy for HE. We also aim to examine the intersection effect of gender, cultural capital, economic capital and residential location (rural vs. urban) in shaping students' self-efficacy for HE.

We formulated three research questions:

1. Do boys and girls from upper secondary schools differ in their self-efficacy for HE after accounting for their cultural and economic capital and residential location (rural vs. urban)?
2. Do gender, cultural and economic capital, and residential location (rural vs. urban) interact/intersect in shaping students' self-efficacy for HE?
3. Do gender, cultural and economic capital, and residential location (rural vs. urban) influence self-efficacy for HE in similar ways for boys and girls?

Drawing on these research questions, three hypotheses were formulated:

H1. Boys will, on average, report higher self-efficacy for HE than girls after accounting for their cultural and economic capital and residential location (rural vs. urban). This expectation draws upon previous findings showing that male students report higher academic self-efficacy compared to their female counterparts (e.g., Alemany-Arrebola et al., 2020; Lane, 2023; Gousia & Maqbool, 2022).

H2. There is intersectional/joint effect of gender, cultural capital, economic capital, and residential location on self-efficacy for HE. These factors interact in a way that disadvantages linked to low capital, living in rural areas, or being female reinforce each other, resulting in lower self-efficacy for students who belong to multiple disadvantaged groups. This hypothesis aligns with the notion that the combined effects of these predictors cannot be understood as the simple sum of their individual impacts. However, incorporating interaction terms in regression models allows for the statistical examination of these joint effects (Bauer et al., 2021).

H3. Greater cultural and economic capital, as well as urban residential location, will be positively associated with self-efficacy for HE among both boys and girls. This is in line with previous research highlighting the relationship between various indicators of higher socio-economic status and academic self-efficacy (e.g., Saadat & Sultana, 2023; Hamel, 2014; Fuentes-Tauber, 2018; Rucinski, 2021).

## **Methodology**

### *Sample and procedure*

The research was conducted in May and June of 2021 within the project “National monitoring of the impact of the COVID-19 pandemic on educational system in Republic of Croatia” that was funded by the Croatian Ministry of science and education. The research was implemented according to the ethical guidelines and was approved by the Ethical Committee of the Institute for Social Research in Zagreb. The study utilized data from a nationally representative sample of 5 106 Croatian students (58.3% female) across 77 upper secondary schools (approximately 82.4 students per school). These students were enrolled in either gymnasium or four-year vocational programs that provided eligibility for HE.

At the end of elementary education, Croatian students can choose from three types of upper secondary education programs. General upper secondary education programs (gymnasiums) last four years and are designed to prepare students for HE. At the end of their fourth year, gymnasium students must take the externally administered State Matura examinations, which serve a dual purpose: certifying the completion of secondary education and qualifying students for entry into HE. These programs do not train students for specific professions; instead, they are intended for those planning to pursue tertiary education. In contrast, four-year vocational education programs prepare students for the labor market while also offering the option to pursue HE if they take the State Matura exams.

The questionnaire was administered in coordination with school principals and staff. School personnel conducted it during class time, and students completed it using a paper-and-pencil format.

## Measures

### Self-efficacy for HE

Self-efficacy for HE was assessed using a scale specifically developed for this project, consisting of three items: *How confident are you that you will successfully... (1) pass the State Matura exams, (2) enroll in the desired study program, and (3) complete the desired study program*. Responses were rated on a 5-point scale (1 – *I am not confident at all* to 5 – *I am fully confident*). The items loaded onto a single factor ( $\alpha = .86$ ). The inclusion of the State Matura item reflects its importance, as passing the Matura exams is a mandatory requirement for applying to HE programs at Croatian universities. Additionally, we operationalized this construct through two items that capture the student's confidence in their ability to succeed in their chosen study program. The results on this scale were used as the outcome variable in our study.

### Residential location

Students were asked to specify where do they live. Possible answers were: 1 - *In the city where I attend school*, 2 - *In another city*, 3 - *In a smaller town*, 4 - *In a village*. In order to more easily test interactions, we dichotomized these categories to 0 – *rural (In a village; In a smaller town)* and 1 – *urban (In the city where I attend school; In another city)*. This variable was used as a predictor in our analysis.

### Cultural capital

We used the number of books at home (cf. OECD, 2024) and parental educational level as measures of cultural capital, representing its objectified and institutional forms,

respectively. Participants were asked to report the number of books in their household (excluding magazines and school textbooks). The response options were: 1 – 0-10, 2 – 11-25, 3 – 26-100, 4 – 101-200, 5 – 201-500, and 6 – *More than 500*. Students also indicated the highest level of education completed by their mother and father (separately). The response categories included *elementary education*, *upper secondary education*, *higher education*, and *I don't know/it does not apply to me*. Cultural capital was also categorized into a dichotomous variable: 0 – *low* (neither parent had completed HE and 25 or fewer books at home), and 1 – *high* (at least one parent had completed HE and more than 25 books at home). This variable was used as a predictor in our analysis.

#### Economic capital

Parental employment status and whether the student had their own room were used as indicators of economic capital. Students reported their parents' employment status separately, with response options: 1 – *employed*, 2 – *unemployed*, 3 – *retired*, and 4 – *I don't know/does not apply to me*. They also indicated whether they had their own room or shared it with someone else in the household. Economic capital was dichotomized as follows: 0 – *low* (either or both parents were not employed, or the student shared a room), and 1 – *high* (both parents were employed, and the student had their own room). This variable was also used as a predictor in our analysis.

#### Gender

Students were also asked to indicate their gender. In our analysis, females were coded as 0, and males as 1, and this variable served as predictor.

## Control variables

Since we expect, based on the reviewed literature, that students in gymnasium programs and those with higher school grades will exhibit greater self-efficacy for HE, we chose to control for these two variables. Upper secondary school program was coded as 0 - vocational or 1 – gymnasium. Students indicated their expected grade point average (GPA) for the end of the current school year using the following scale: 1 – 2.00-2.50, 2 – 2.51-3.00, 3 - 3.01-3.50, 4 – 3.51-4.00, 5 – 4.01-4.50 and 6 – 4.51-5.00. In Croatia, the school grading scale is as follows: 1 - insufficient (fail), 2 – sufficient (pass), 3 – good, 4 – very good, 5 - excellent.

## *Statistical analysis*

Our sample had a hierarchical structure, with groups of students nested within different schools. Since students from the same school are likely to have more similar responses than those from different schools, we used multilevel regression modelling with a random intercept to account for this. The analysis shows that the intraclass correlation coefficient (ICC) was .096, indicating the necessity of conducting a multilevel analysis. The analysis was performed using the mixed model procedure in IBM SPSS 22. Parameter estimates were generated using restricted maximum likelihood estimation (REML).

Students' self-efficacy for HE served as the outcome variable. Regressors were added to the model in three blocks: 1) control variables (student's expected GPA, upper secondary school program), 2) main variables (gender, residential location, cultural capital, economic capital), and 3) two-way interactions of main variables. To address

research question 3, a model incorporating control and main variables was replicated separately for sub-samples of females and males. Continuous variables (expected GPA and self-efficacy) were mean-centered prior to modelling. All variables had variance inflation factors (VIF) below 2, indicating no evidence of multicollinearity.

## **Results**

### *Descriptive statistics*

Descriptive statistics for the variables used in the study are shown in Table 1. On average, students in the sample reported a moderate level of confidence regarding HE and high expectations for their GPA. The majority of participants were from vocational schools, and most were female. The gender imbalance can be attributed to the exclusion of data from students attending three-year vocational schools, where males are the majority. Three-year vocational education programs focus on training students for careers in industry and crafts. However, a certificate from a three-year vocational education program does not grant eligibility for further education at universities or polytechnics. Therefore, we did not use the data collected from three-year vocational education students in our study.

The majority of students in the sample lived in urban areas and had low cultural capital, as defined for the purpose of this study. The number of students with low and high economic capital was nearly equal in our sample.

Table 1. Descriptive statistics of the variables used in the study

|                                | %    | M    | SD   | Min | Max |
|--------------------------------|------|------|------|-----|-----|
| Self-efficacy for HE           |      | 3.50 | 0.96 | 1   | 5   |
| GPA                            |      | 4.70 | 1.23 | 1   | 6   |
| Upper secondary school program |      |      |      |     |     |
| Vocational                     | 60.2 |      |      |     |     |
| Gymnasium                      | 39.8 |      |      |     |     |
| Gender                         |      |      |      |     |     |
| Female                         | 58.3 |      |      |     |     |
| Male                           | 41.7 |      |      |     |     |
| Location                       |      |      |      |     |     |
| Rural                          | 39.9 |      |      |     |     |
| Urban                          | 60.1 |      |      |     |     |
| Cultural capital               |      |      |      |     |     |
| Low                            | 65.2 |      |      |     |     |

|                  |      |      |
|------------------|------|------|
|                  | High | 34.8 |
| Economic capital |      |      |
|                  | Low  | 51.7 |
|                  | High | 48.3 |

---

### *Bivariate correlations*

On a bivariate level, self-efficacy for HE demonstrates positive correlations with GPA, attending a gymnasium upper secondary program, cultural capital, economic capital, and urban residence, although the magnitudes are generally small to moderate (Table 2). GPA is positively associated with both forms of capital and with enrolment in gymnasium programs. Gender exhibits small yet significant correlations with GPA and school program, with male students showing slightly lower academic performance and lower representation in gymnasium tracks. Urban residence correlates positively with cultural capital and self-efficacy.

Table 2. Pearson correlation coefficients of variables used in the study

|                                  | GPA     | School<br>program<br>(gymnasium) | Gender<br>(male) | Location<br>(urban) | Cultural<br>capital | Economic<br>capital | Self-<br>efficacy<br>for HE |
|----------------------------------|---------|----------------------------------|------------------|---------------------|---------------------|---------------------|-----------------------------|
| GPA                              | 1       | .288**                           | -.250**          | .073**              | .136**              | .070**              | .300**                      |
| School<br>program<br>(gymnasium) | .288**  | 1                                | -.193**          | .133**              | .283**              | .104**              | .225**                      |
| Gender (male)                    | -.250** | -.193**                          | 1                | .034*               | .039**              | .020                | -.009                       |
| Location<br>(urban)              | .073**  | .133**                           | .034*            | 1                   | .217**              | .029*               | .115**                      |
| Cultural<br>capital              | .136**  | .283**                           | .039**           | .217**              | 1                   | .117**              | .168**                      |
| Economic<br>capital              | .070**  | .104**                           | .020             | .029*               | .117**              | 1                   | .082**                      |

|                         |        |        |       |        |        |        |   |
|-------------------------|--------|--------|-------|--------|--------|--------|---|
| Self-efficacy<br>for HE | .300** | .225** | -.009 | .115** | .168** | .082** | 1 |
|-------------------------|--------|--------|-------|--------|--------|--------|---|

#### *Multilevel regression models of self-efficacy for HE*

Multilevel regression analysis of self-efficacy for HE with a random intercept showed that expected GPA and attending a gymnasium upper secondary program predict self-efficacy for HE (Table 3, Model 1), which is consistent with the results of the bivariate analysis. In Model 2, urban location, cultural capital, and economic capital all predicted self-efficacy, along with male gender, which did not show a statistically significant correlation in the bivariate analysis. This change in gender effect occurred due to controlling for the upper secondary school program. In relation to research question 1, we conclude that gender differences in self-efficacy for HE—favoring boys—persist even after accounting for cultural capital, economic capital, and residential status (urban vs. rural). In other words, the findings align with H1.

Regarding research question 2, Model 3 identified only two statistically significant interaction effects: one between gender and cultural capital and another between

location and cultural capital. Figures 1 and 2 illustrate these two effects. The impact of cultural capital on self-efficacy for HE was slightly greater for male students compared to females (Figure 1). Additionally, cultural capital had a marginally stronger effect on students from rural areas—an influence so minor that it is not discernible in Figure 2. Model fit indices suggest that adding interaction terms in Model 3 did not enhance the model's fit compared to Model 2. Interpreted in light of H2, the findings fail to confirm the hypothesis that students belonging to multiple disadvantaged groups (females, rural location, low cultural and economic capital) would show substantially lower self-efficacy due to compounding effects of gender, capital, and location. The weaker effect of cultural capital among girls contradicts the expected intersectional pattern: if disadvantages compounded, low cultural capital should have had a stronger negative impact on female students' self-efficacy, not a weaker one. For rural students, the slightly stronger effect of cultural capital is more consistent with H2, as it suggests that low cultural capital may be especially limiting for self-efficacy for HE in rural contexts. However, given the very small magnitude of the interaction, this evidence remains modest. Overall, the interaction effects do not show the clear amplification of disadvantage expected from an intersectional perspective, offering only weak support for the compounding mechanism proposed in H2.

We also calculated the reductions in variance estimates, a metric analogous to  $R^2$  (Heck et al., 2013), for both the within-school and between-school components of the models (referred to as pseudo  $R^2$  in Table 3). These values indicate that our models explain a substantial portion of the variance in the outcome variables at the school level and a smaller portion at the student level.

In line with research question 3, Table 4 presents the results of multilevel regression models for upper secondary students' self-efficacy for HE with a random intercept, analyzed separately for females and males. These analyses mirror the main effects of GPA, school program, and location observed in the overall sample. However, economic capital emerged as a statistically significant predictor for females but not for males, while cultural capital was a significant predictor for males but not for females. Thus, the findings provide only partial support for H3. The model was more effective in explaining the results for males than for females.

Table 3. Multilevel regression models of upper secondary students' self-efficacy for HE with a random intercept

|                                            | Model 1<br>(N=4963) | Model 2<br>(N=4151) | Model 3<br>(N=4151) |
|--------------------------------------------|---------------------|---------------------|---------------------|
| Intercept                                  | 0.43**              | 0.36**              | 0.39**              |
| GPA                                        | 0.21**              | 0.22*               | 0.22**              |
| Upper secondary school program (gymnasium) | 0.29**              | 0.25**              | 0.26**              |
| Gender (male)                              |                     | 0.19**              | 0.19*               |
| Location (urban)                           |                     | 0.11**              | 0.11*               |
| Cultural capital                           |                     | 0.12**              | -0.13               |
| Economic capital                           |                     | 0.08**              | 0.15                |
| Gender (male) X location (urban)           |                     |                     | 0.04                |
| Gender (male) X cultural capital           |                     |                     | 0.20**              |
| Gender (male) X economic capital           |                     |                     | -0.04               |

|                                     |          |          |          |
|-------------------------------------|----------|----------|----------|
| Location (urban) X cultural capital |          |          | -0.13*   |
| Location (urban) X economic capital |          |          | 0.03     |
| Cultural capital X economic capital |          |          | -0.03    |
| -2RLL                               | 15627.06 | 12663.97 | 12667.57 |
| AIC                                 | 15631.06 | 12667.97 | 12671.57 |
| BIC                                 | 15644.45 | 12680.97 | 12684.56 |
| Pseudo R <sup>2</sup> student level | 0.07     | 0.11     | 0.11     |
| Pseudo R <sup>2</sup> school level  | 0.66     | 0.66     | 0.66     |

Figure 1. Interaction effect of gender and cultural capital on upper secondary students' self-efficacy for HE

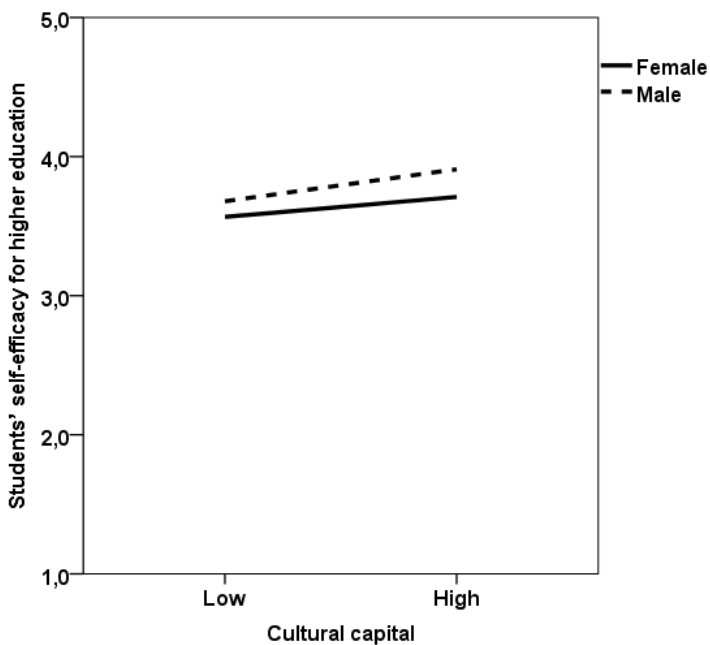


Figure 2. Interaction effect of location and cultural capital on upper secondary students' self-efficacy for HE

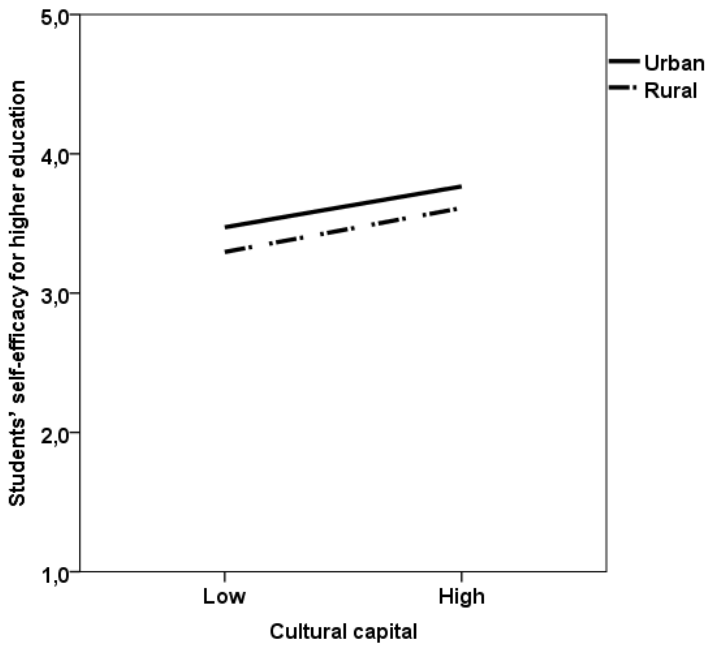


Table 4. Multilevel regression models of upper secondary students' self-efficacy for HE with a random intercept - separately for females and males

|                                            | Females | Males   |
|--------------------------------------------|---------|---------|
| Intercept                                  | 0.30**  | 0.76**  |
| GPA                                        | 0.15**  | 0.28**  |
| Upper secondary school program (gymnasium) | 0.18**  | 0.38**  |
| Location (urban)                           | 0.11**  | 0.12**  |
| Cultural capital                           | 0.07    | 0.20**  |
| Economic capital                           | 0.10**  | 0.05    |
| -2RLL                                      | 7370.33 | 5267.50 |
| AIC                                        | 7374.33 | 5271.50 |
| BIC                                        | 7386.28 | 5282.70 |
| Pseudo R <sup>2</sup> student level        | 0.03    | 0.14    |

## Discussion

This study investigated gender differences in upper secondary students' self-efficacy for HE, as well as how gender, cultural capital, economic capital, and residential location (rural vs. urban) intersected to shape these outcomes. In our discussion of the results, we will focus on the main results of multilevel regression modelling of self-efficacy for HE, as it offers deeper insights into intersecting gender inequalities in this area.

Additionally, this analysis contributes to quantitative intersectional research by examining the combined effects and interactions of multiple variables, such as social categories, on gender disparities in self-efficacy. This is particularly significant given that intersectional research on gender inequality has predominantly relied on qualitative approaches.

The first research question examined gender differences in students' self-efficacy for HE while considering their cultural and economic capital, as well as their residential location

(urban vs. rural). The findings revealed that male students, urban students, and those with higher cultural and economic capital reported greater self-efficacy for HE compared to other students, indicating that they have a higher likelihood of pursuing HE. In other words, boys on average report higher self-efficacy for HE than girls after accounting for their cultural and economic capital and residential location, supporting thus our H1 (Model 2 in Table 3).

The findings in Table 3 also relate to our second research question (Model 3).

Compared to Model 2, Model 3 additionally considers interactions among categories in relation to self-efficacy, providing more nuanced insights into intersectional gender differences in self-efficacy. From the perspective of quantitative intersectionality, it is important to highlight that Model 3 identified two statistically significant interaction effects concerning research question 2: one between gender and cultural capital and another between location and cultural capital. The findings showed that male students with higher cultural capital demonstrated higher self-efficacy for HE than their female counterparts, thereby contradicting H2.

Additionally, the impact of cultural capital was slightly stronger for students in rural areas, indicating that rural students with higher cultural capital had higher self-efficacy than boys and girls from rural backgrounds (consistent with H2). Specifically, reflecting the intercategorical approach by including multiple categories of inequality in the analysis, along with their interrelationships and combined effects on gender differences in self-efficacy, multilevel regression modelling identified two key factors shaping inequalities in self-efficacy: cultural capital and residential location. The findings highlight that students with low cultural capital and students from rural area are

particularly vulnerable in terms of self-efficacy for HE. Another Croatian study on the HE choice of upper secondary school students also found that students from rural counties are less inclined to pursue HE than students from urban counties, with students in rural areas having lower economic and cultural capital compared to their urban peers (Klepač, 2015). Despite country specificities, the gap in HE enrolment between rural and urban areas also exists in other European countries such as the Netherlands (van Maarseveen, 2021) and Norway (Zahl-Thane and Rye, 2024), indicating its broader relevance.

A significant advantage of using multilevel regression modelling is its ability to simultaneously examine the interactions of factors affecting gender differences in self-efficacy at both the individual and school levels. Our models demonstrated greater explanatory power for self-efficacy for HE at the school level compared to the individual student level. This finding highlights the importance of differences in secondary school programs. In Croatia, similar to many other European countries (e.g., Germany, the Netherlands, Italy, Austria, and Latvia), gymnasiums function as upper secondary institutions with a strong orientation toward preparing students for tertiary studies. This focus is associated with increased academic self-efficacy among their students relative to those attending other forms of secondary schooling.

(Van Rooij et al., 2017; European Commission/EACEA/Eurydice, 2023). The inequality in school programs, which contributes to disparities in students' confidence regarding successful enrolment in HE, raises important questions about the role of schools in enhancing students' self-efficacy for continuing their education at the tertiary level. Further quantitative intersectional research is required to investigate how horizontal

structural inequalities and gender disparities within secondary education shape students' self-efficacy and influence their transition into HE.

Corresponding to our third research question, Table 4 displays the results of multilevel regression models analyzing differences in self-efficacy for HE among female and male students separately (intracategorical approach). The findings align with the overall sample, reflecting the main effects of GPA, school program, and residential location. Specifically, they suggest that female students with higher academic performance (GPA), enrolled in gymnasiums, and residing in urban areas demonstrate greater self-efficacy for HE, indicating a higher likelihood of enrolling in HE compared to other female students. The same effects apply to male students. However, economic capital emerged as a significant factor influencing self-efficacy among females, whereas cultural capital played a more prominent role for males. These findings suggest that components of social class background shape self-efficacy for pursuing HE differently for each gender—economic resources being more influential for girls and cultural resources for boys. Consequently, the results indicate that H3 is supported only partially. Furthermore, the model's greater effectiveness in explaining self-efficacy among males underscores the significant influence of cultural resources in motivating boys to pursue HE. Other studies in Croatia have highlighted the key role of parental education in this regard (Jugović, 2015).

Overall, our study highlights two issues relevant to the development of HE strategies in Croatia and in other European countries with similar educational contexts. First, the findings identify gender differences in HE self-efficacy between girls and boys, as well

as within each group, which are associated with variations in cultural capital, economic capital, and residential location (rural vs. urban).

Second, the findings also demonstrate the significant role played by the hierarchical horizontal structure of upper secondary education programs in generating inequalities in students' self-efficacy for pursuing HE.

By addressing these issues, education policies can strengthen students' confidence in pursuing HE, thereby contributing to a larger cohort of highly educated individuals who are essential for economic development and the advancement of gender equality in Croatia as well as in other European countries. From a gender-equality perspective, it is particularly important to emphasise the need to enhance girls' confidence in pursuing STEM fields—areas that play a pivotal role in the development of modern European societies and in which women remain significantly underrepresented.

## **Conclusion**

Investigating gender differences in self-efficacy for HE is essential for supporting the strategic priorities of both Croatia and the EU, particularly those concerning expanding participation in HE and addressing gender inequality. This focus has gained further importance as European and Croatian strategic agendas emphasize the development of digitally advanced and environmentally sustainable societies that rely on highly educated individuals.

An added value of applying quantitative intersectional analysis lies in its capacity to examine how social and individual factors interact to shape self-efficacy for HE, both between and within gender groups. Our findings indicate that cultural and economic resources, together with residential location (rural vs. urban), play a central role in shaping students' self-efficacy. These influences vary by gender and, in turn, contribute to educational disparities that tend to favour boys. By highlighting the intersection of social categories, this approach underscores the importance of broader socioeconomic and sociocultural context in shaping gender differences in students' self-efficacy for pursuing HE. These insights have significant implications for the design of interventions aimed at enhancing female students' self-efficacy, as effective strategies must simultaneously address multiple influencing factors. This consideration is also pertinent within the European context, where gender inequalities remain evident. Furthermore, the use of multilevel regression modeling provided a significant methodological benefit, as it enabled the analysis of intersecting influences that simultaneously shape gender disparities in students' self-efficacy at both individual and school levels. Our models proved more effective in explaining self-efficacy for HE at the school level than at the individual student level. This finding highlights the crucial role of upper secondary schools in shaping students' confidence to pursue tertiary education, bringing attention to concerns regarding the hierarchical nature of horizontal structure of secondary schooling in Croatia and other European countries.

Self-efficacy is a key factor in shaping secondary school students' decisions to enrol in HE. This issue is closely connected to strategic European and Croatian policy objectives aimed at increasing the proportion of individuals with HE qualifications, which

also entails addressing existing gender inequalities in HE. Advancing intersectional research on gender differences in self-efficacy related to the pursuit of tertiary education is therefore essential. Given that self-efficacy for HE is highly task- and context-specific, strengthening intersectional research agendas at both national and European levels is of critical importance.

### **Limitations and suggestions for further research**

One limitation of this study lies in its reliance on a correlational design, which restricts the ability to infer causal relationships. Utilizing a longitudinal design to examine moderation effects could provide stronger evidence regarding how various factors interact over time to influence self-efficacy for HE among upper secondary students. Although Croatia has certain contextual specificities, several mechanisms examined in this study—such as the role of gender, cultural capital, economic capital, and urban–rural divides—are relevant across many European and OECD countries. At the same time, features unique to the Croatian education system and its socio-economic landscape limit the extent to which the findings can be directly generalized. Future research should therefore replicate the analyses in other national and educational settings comparable to the Croatian context, to assess the robustness of these patterns and to identify which effects are context-dependent. Since self-efficacy can vary across academic subjects and fields of study, future research would benefit from examining gender differences in self-efficacy within specific disciplines, especially those with significant gender imbalances. This approach could provide more detailed insights into

gender-related disparities in self-efficacy concerning HE. Additionally, including more personal factors (such as anxiety or stress) in quantitative intersectional analysis could deepen our understanding of how the interaction between contextual and individual characteristics affects students' decisions to pursue education beyond secondary school.

## References

- Alemany-Arrebola I, Rojas-Ruiz G, Granda-Vera J and Mingorance-Estrada AC (2020) Influence of COVID-19 on the Perception of Academic Self-Efficacy, State Anxiety, and Trait Anxiety in College Students, *Frontiers in Psychology* 11:570017.  
<https://doi.org/10.3389/fpsyg.2020.570017>
- Bandura A (1986) *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs NJ: Prentice-Hall.
- Bandura A (1997) *Self-efficacy: The exercise of control*. New York: Freeman.
- Bauer GR, Churchill SM, Mahendran M, Walwyn C, Lizotte D and Villa-Rueda AA (2021) Intersectionality in quantitative research: A systematic review of its

emergence and applications of theory and methods. *SSM-population health* 14: 100798. <https://doi.org/10.1016/j.ssmph.2021.100798>

Bourdieu P (1977) The forms of capitals In: A H Halsey, H Lauder, P Brown and A S Wells (eds) *Education: Culture, economy, and society*. pp. 46-58, Oxford, England: Oxford University Press.

Codioli McMaster N and Cook R (2019) The contribution of intersectionality to quantitative research into educational inequalities. *Review of Education* 7(2): 271-292. <https://doi.org/10.1002/rev3.3116>

Croatian Strategy for Education, Science, and Technology (2021) *National Framework for Education and Development*. Ministry of Science and Education, Croatia.

EIGE (2023) *Gender Equality Index 2023. Towards a green transition in transport and energy*. Luxembourg: Publications Office of the European Union.

European Commission (2023) Europe's Digital Decade: Digital targets for 2030. Available at: [https://commission.europa.eu/europes-digital-decade-digital-targets-2030-documents\\_en](https://commission.europa.eu/europes-digital-decade-digital-targets-2030-documents_en) (accessed 28 November 2025).

European Commission / EACEA / Eurydice (2023) *The Structure of the European Education Systems 2023/24: Schematic Diagrams*. Luxembourg: Publications Office of the European Union.

European Commission (2025a) Education and Training Monitor 2025. Available at: <https://op.europa.eu/webpub/eac/education-and-training-monitor/en/index.html> (accessed 27 November 2025).

European Commission (2025b) Higher education initiatives – About higher education.

European Education Area. Available at: <https://education.ec.europa.eu/education-levels/higher-education/about-higher-education> (accessed 5 November 2025).

European Commission: Directorate-General for Communication (2019) *What is the European Green Deal?* Publications Office. Available at:

<https://data.europa.eu/doi/10.2775/275924> (accessed 28 November 2025).

European Commission: Directorate-General for Employment, Social Affairs and

Inclusion (2020) *European skills agenda – Skills for jobs*. Publications Office.

Available at: <https://data.europa.eu/doi/10.2767/978543> (accessed 28 November 2025).

European Council (2024) Strategic agenda 2024-2029. Available at:

<https://www.consilium.europa.eu/en/european-council/strategic-agenda-2024-2029/#competitive> (accessed 17 December 2024).

Eurostat (2022) Educational attainment by field of education and gender. Available at:

<https://ec.europa.eu/eurostat> (accessed 28 November 2025).

Eurostat (2023) *Key figures on Europe. 2023 edition*. Luxembourg: Publications Office of the European Union.

Fuentes-Tauber Y (2018). An investigation of self-efficacy and its relationship to

college-going self-efficacy among middle school students. In: *Proceedings of the 11th International RAIS Conference on Social Sciences*, Rockville, USA, 19-20 November 2018.

- Gousia J and Maqbool A (2022) Difference in Self-efficacy of College Students during COVID-19 with Respect to Gender and Streams of Study. *International Journal of Early Childhood Special Education* 14(1):4295-4303.  
<https://doi.org/10.48047/INTJECSE/V14I1.533>
- Hamel J (2014) *Career Camp: Elevating Expectations for College Going and Career Self-efficacy in Urban Middle School Students*. PhD Thesis, Kansas State University, USA.
- Heck RH, Thomas SL and Tabata LN (2013) *Multilevel and longitudinal modeling with IBM SPSS*. New York: Routledge.
- Jugović I (2015) Rodna dimenzija odabira područja studija. In: Baranović B (ed) *What Do High School Students Plan to study? – Access To Higher Education and Choice of Study*. pp. 165-185, Zagreb, Croatia: Institute for Social Research in Zagreb.
- Klepač O (2015) Regional Aspects of Study Decision, Capital Distribution and Study Intention. In: Baranović B (ed) *What Do High School Students Plan to study? – Access To Higher Education and Choice of Study*. pp. 187-207, Zagreb, Croatia: Institute for Social Research in Zagreb.
- Kurniawan C, Soepriyanto Y, Zakaria Z and Aulia F (2021) Gender Differences in E-Learning Self-Efficacy during Pandemic Covid-19. *Advances in Social Science, Education and Humanities Research* 649:79-83.  
<https://doi.org/10.2991/assehr.k.220304.011>

- Lane V (2023) Academic Self-Efficacy in College Students During the COVID-19 Pandemic. PhD Thesis, The University of New Mexico, USA.
- Malespina A and Singh C (2024) Introductory physics during COVID-19 remote instruction: gender gaps in exams are eliminated, but test anxiety and self-efficacy still predict success. *European Journal of Physics* 45:045710.  
<https://doi.org/10.1088/1361-6404/ad57b2>
- McCall L. (2005) *The complexity of Intersectionality*. The University of Chicago Press.
- McKechnie DJ (2012) *Factors Related to College Going Self-efficacy Among Urban African American High School Students*. PhD Thesis, University of Maryland, USA.
- Mittal R. (2021) Covid -19 & college students: a study on gender difference in college students self-efficacy, social support & meaning in life. *Indian psychology*. 9 (1).  
<https://doi.org/10.25215/0901.073>
- OECD (2023) *Education at a Glance 2023: OECD indicators*. OECD Publishing.  
<https://doi.org/10.1787/e13bef63-en>
- OECD (2024) *PISA 2022 Results (Volume IV): How Financially Smart Are Students?* Paris: PISA, OECD Publishing.
- Prihandono WS, Suhatmady B and Iswari WP (2021) Investigating Gender Differences in Senior High School Students' Motivation to Learn English Online During The COVID-19 Pandemic. *Educational Studies: Conference Series* 1(1):246–257.  
<https://doi.org/10.30872/escs.v1i1.880>

- Ristić Dedić Z and Jokić B (2021) Generacija 'Zakinuti!' - perspektive učenika o učincima pandemije na psihosocijalnu i obrazovnu dobrobit. In: *25th Ramiro and Zoran Bujas Days*, Zagreb, Croatia, 30 September - 2 October 2022.
- Rucinski J (2021) *Perceived Educational Barriers and Academic and College-going Self-efficacy Beliefs of High School Students*. PhD Thesis, Aurora University, USA.
- Saadat Z and Sultana AM (2023) Understanding gender disparity: factors affecting higher education self-efficacy of students in Malaysia. *Journal of Science and Technology Policy Management* 15(6):1157-1181. <https://doi.org/10.1108/JSTPM-10-2022-0165>
- Symeonidis V, Francesconi D and Agostini E (2021) The EU's Education Policy Response to the Covid-19 Pandemic: A Discourse and Content Analysis. *CEPS Journal* 11:89-115. <https://doi.org/10.26529/cepsj.1137>
- Šabić J and Baranović B (2022) Upper Secondary School Students' Self-efficacy for Higher Education: the Intersectionality of Gender, Place of Residence, Cultural and Economic Capital. In: *European Conference on Educational Research - ECER 2022*, Yerevan, Armenia, 23 - 25 August 2022.
- Talsma K, Robertson K, Thomas C and Norris K (2021) COVID-19 Beliefs, Self-Efficacy and Academic Performance in First-year University Students: Cohort Comparison and Mediation Analysis. *Frontiers in Psychology* 12:643408. <https://doi.org/10.3389/fpsyg.2021.643408>

van Maarseveen R (2021) The Urban-Rural Education Gap: Do Cities Indeed Make Us Smarter? *Journal of Economic Geography* 21:683-714

<https://doi.org/10.1093/jeg/lbaa033>

Van Rooij E C M, Jansen E. P. W. A. and Van de Grift W J C.M. van de (2017) Factors that contribute to secondary school students' self-efficacy in being a successful university student. *Research in Post-Compulsory Education* 22(4):535-555.

<https://doi.org/10.1080/13596748.2017.1381301>

Zahl-Thanem A and Rye F (2024) Spatial inequality in higher education: a growing urban–rural educational gap? *European Sociological Review* 40(6):1-15.

<https://doi.org/10.1093/esr/jcae015>