



STUDENT TEACHERS' PERCEPTIONS OF TEACHING: LOOKING BACK OR MOVING FORWARD?

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Abstract/Izvlaček

The aim of the study was to compare perceptions about the teaching of the subject "Nature and Society" among preservice primary school teachers at three Croatian universities. The results indicate consistent perceptions among second- and fifth-year students, regardless of their university, with a notable inclination toward teacher-centred teaching. Fifth-year students from all three universities demonstrate a slight shift away from the traditional teaching paradigm compared with second-year students. For a genuine transformation in teaching approaches, in addition to acquired knowledge and developed competences, it is essential to encourage preservice teachers to engage in self-reflection on their teaching practices to become aware of their own beliefs about teaching.

Keywords:

DASTT-C, student-centred teaching, teacher-centred teaching, perception, preservice primary school teachers.

Ključne besede:

DASTT-C, v učenca usmerjen pouk, v učitelja usmerjen pouk, percepcija, študenti bodoči učitelji.

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Pogledi bodoćih učiteljev na poučevanje: pogled nazaj ali korak naprej?

Cilj raziskave je bil primerjati percepcijo pouka Naravoslovja in družbe med študenti, bodoćimi učitelji razrednega pouka na treh hrvaških univerzah. Rezultati kaŹejo na homogenost percepcij študentov 2. in 5. letnika glede pouka, ne glede na univerzo, na kateri študirajo, pri čemer je opazna izrazita tendenca k pouku, usmerjenemu na učitelja. Študenti 5. letnika vseh treh univerz v primerjavi s študenti 2. letnika izkazujejo nekoliko većji odmik od tradicionalne ućne paradigme. Za dejansko spremembo ućne paradigme pa je poleg pridobljenega znanja in razvitih kompetenc pomembno spodbujati študente, bodoće učitelje, k samorefleksiji poućevalne dejavnosti, da bi postali bolj zavedni svojih preprićanj o poućevanju.

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Introduction

The study focuses on perceptions about teaching “Nature and Society”, a subject integrated into the Croatian primary school curriculum from first to fourth grade. The most recent educational reform introduced a new “Nature and Science” curriculum, structured around the concepts of Organization of the World Around Us, Changes and Relationships, Individual and Society, and Energy. This curriculum emphasizes a constructivist approach, incorporating experiential, inquiry-based, and problem-solving learning, and promoting student-centred teaching that ensures their active engagement (MZO, Curriculum for the Subject Nature and Society, 2019). Although contemporary teaching paradigms have been embedded in Croatian educational documents for two decades, their implementation in practice remains gradual.

Preservice teachers enter their studies with pre-existing beliefs about learning and teaching, shaped by their twelve years of prior schooling. According to Nespor (1987), such beliefs strongly predict teachers’ behaviour in the classroom. Studies (Thomas, Pederson and Finson, 2001; Markic and Ingo, 2010; Minogue, 2010; Jones and Leagon, 2014) indicate that these beliefs and mental models predominantly align with traditional teaching approaches, where teacher-centred, lecture-based teaching prevails, with teachers guiding the process, while students remain passive observers. Research by Kalyon (2020) examining teachers and their students suggests a correlation between teaching styles and student perceptions of teaching. Students of teachers who adhere to a traditional teaching style see themselves in a similar role, while those taught by educators employing constructivist methods perceive learning accordingly. Aydogdu and Selanik-Ay (2016) report that novice teachers and preservice teachers are more inclined toward student-centred teaching, favouring constructivist approaches to learning and teaching. Go and Kang (2015) highlight the influence of teacher education on shaping preservice teachers’ beliefs about science teaching and learning. Bakir (2016) emphasizes the role of university faculty in shaping future teachers’ teaching styles. Methodology courses in teacher education programs provide students with knowledge of teaching practices linked to direct classroom experience (Stroupe et al., 2020). Preservice teachers gain experience by planning, designing, and conducting lessons in training schools, engaging in professional teaching practice, and analysing and reflecting on their teaching activities. Beyond the acquisition of methodological knowledge, greater emphasis should be placed on making students aware of their existing beliefs about teaching

and supporting their gradual adaptation, as these beliefs will ultimately shape their professional practice (Nilsson and Loughran, 2012). According to Fosnot (2005), students in methodology courses reflect on their learning processes, leading to a shift in their perception of the teacher's role—from a direct instructor to a facilitator of scientific thinking who aligns student activities with learning outcomes. Nilsson and Loughran (2012) also identify the need for structured support in connecting theoretical coursework with practical experience. Letina and Canjek-Androić (2025) highlight the importance of guidance in implementing teaching strategies, problem-based teaching, and scientific inquiry models. Nordine et al. (2021) describe an international model of coherent science education that fosters collaboration between universities and schools, where university faculty and school-based mentor teachers work together to support preservice teachers in a plan-teach-reflect cycle, which positively impacts and reshapes their teaching beliefs. Self-reflection on teaching practices and strategies is essential not only for students but also for the teachers and university faculty involved in teacher preparation. Professional development programs should integrate self-reflection as a driving force for professional growth, rather than relying solely on information-based lectures (Valenčič Zuljan, 2008). Go and Kang (2015) report that teachers who engaged in reflective practices re-evaluated their beliefs and revised their teaching approaches, leading to meaningful professional development. Their findings include examples of teachers who, through professional training, learned to structure lessons in ways that encourage students to explore, think critically, and draw conclusions independently, rather than relying solely on teacher demonstrations.

Examining students' perceptions about the teaching of "Nature and Society" is justified by the need to understand their professional beliefs that shape their future teaching practice, while also contributing to the improvement of initial teacher education programs, the development of more effective teaching strategies at the university level, the planning of high-quality professional development for teachers, and the strengthening of self-reflection among students, educators, and university faculty.

Method

The study aimed to examine and compare preservice primary school teachers' perceptions about the teaching of the subject "Nature and Society" across three Croatian universities. The research questions focused on identifying and analysing

differences in perceptions between second- and fifth-year teacher education students during the 2022/23 academic year.

The following hypotheses were tested:

H1: There is no statistically significant difference in perceptions about the teaching of “Nature and Society” among second-year students based on their university.

H2: There is no statistically significant difference in perceptions about the teaching of “Nature and Society” among fifth-year students based on their university.

The study included 288 students from the second and fifth years of teacher education programs: N=129 from the Faculty of Teacher Education, University of Zagreb; N=97 from the Faculty of Education, University of Osijek; and N=62 from the Faculty of Humanities and Social Sciences, University of Split (Table 1). The data was collected during the 2022/23 academic year. Second-year students were selected as participants because they had not yet developed methodological competences but possessed basic pedagogical, psychological, and didactic knowledge. Teacher education programs introduce teaching methodology courses, including “Methodology for ‘Nature and Society’”, in the third year of study. Fifth-year students were also included in the study, since they were in their final year and would soon enter the teaching profession. All participants provided informed consent and had the option to withdraw from the study at any time. Table 1 presents the sample distribution according to independent variables, study year, and university affiliation. The sample was balanced in terms of the study year, with second-year students (N=126, 43.7%) and fifth-year students (N=162, 56.3%) represented in similar proportions. Given the predominance of female students in teacher education programs, the sample was not gender-balanced, and gender differences were not analysed. This sample provides insight into the structure and implementation of, and reflection on higher education teaching in programs for teacher education and related programs in Croatia.

Table 1.

Structure of the sample in terms of place and year of study

University	2 nd year	5 th year	Total (N)
Zagreb	47	82	129
Osijek	45	52	97
Split	34	28	62
Total (N)	126	162	288

For the purpose of this research, the Draw-A-Science-Teacher-Test-Checklist (DASTT-C) questionnaire by Thomas et al. (2001) was used. The aim of the DASTT-C questionnaire was to examine the perception of student teachers through two means: a) depicting themselves as teachers in a “Nature and Society” class, and b) positioning on the continuum of teaching theories, which assesses students’ perception of teaching in this subject area. The instrument consists of two parts: the first part includes a blank square in which students draw themselves as teachers in a “Nature and Society” class. Below the square, there are blank lines where students briefly describe the activities of the teacher and students in the drawing. This brief description serves to facilitate the interpretation of the drawings and enables a more precise assessment of specific aspects. The instructions given to participants for completing the questionnaire were simple: “Draw yourself as a teacher in a “Nature and Society” class and write a short description of the drawing.” Participants were given 15 minutes to complete the task and were explicitly told that drawing skills were not being assessed. For analysis of the DASTT-C questionnaire results, we used a quantitative frequency content analysis of the drawings by the 2nd and 5th-year students (N=288). These drawings served as the data source. The unit of analysis for the drawings consisted of indicators marked on the DASTT-C checklist for evaluators. The checklist contains three main sections: Teacher (5 indicators), Students (3 indicators), and Environment (5 indicators). The drawings were independently evaluated by three associate professors specializing in didactics and methodology, who assessed the presence (1) or absence (0) of each of the 13 indicators in the drawings. Cohen’s kappa coefficient was used as a measure of inter-rater agreement. In cases of disagreement between two raters, the third rater’s opinion determined the final decision by confirming the judgment of either the first or second rater. Thomas et al. (2001) established the reliability of the DASTT-C questionnaire, with a Cronbach’s Alpha coefficient of 0.82, Finson et al. (2006) reported values between 0.94 and 0.98, and Škugor (2013) reported 0.76.

Data collected during the empirical research were quantitatively processed using the statistical program SPSS 20.0. Univariate analysis procedures were applied to determine descriptive characteristics, including arithmetic mean, standard deviation, minimum and maximum values, skewness, kurtosis, and data distribution expressed in frequencies and percentages. The Kolmogorov-Smirnov test indicated that the data distribution deviated from normality, which was further confirmed by the Shapiro-Wilk test. Consequently, the Kruskal-Wallis non-parametric test was used to compare participants based on educational characteristics related to their place of study.

Results and Discussion

Before data processing, Kappa coefficients were calculated for all 13 indicators, ranging from 0.87 to 1.00, indicating almost perfect agreement among raters. The total number of indicators present in each drawing was then summed overall and within specific sections (Teacher, Students, Environment). Results were classified into three ranked categories along a continuum based on the indicators present in the drawings, reflecting the characteristics of constructivist, traditional, or undefined teaching approaches. Scores from 0 to 4 indicate a teacher whose teaching style is constructivist, inquiry-based, and student-centred; scores from 5 to 6 indicate a teacher with a conceptual teaching style that is insufficiently constructivist; and scores from 7 to 13 indicate a teacher whose teaching style is explicit, traditional, lecture-based, and teacher-centred. Various authors, such as El-Deghaidy (2006), Yilmaz et al. (2007), and Tatar et al. (2012), reported different distributions of results across categories, whereas the authors of this research followed the categorization outlined by the instrument's authors, Thomas et al. (2001). A similar categorization was applied by Louca et al. (2002), Markic and Ingo (2010), Škugor (2013), Azam and Menon (2021), and Škugor et al. (2024).

The first step in the statistical analysis of the DASTT-C questionnaire results was to analyse the frequency of students' perceptions of "Nature and Society" teaching among 2nd-year students in the 2022/23 academic year (N=126), categorized by their universities. The frequencies of individual category results (from 0 to 13) were expressed as percentages for each university (Table 2). The analysis showed that the overall DASTT-C checklist scores for all 2nd-year students ranged between 3 and 13 points. Drawings with a total score of zero contained one of the assessed indicators. At the University of Zagreb, the frequency range of 2nd-year students'

results was between 3 and 13, with the most frequent score being 11 ($Mo=11$, $f_{max}=9$), representing 19.2% of students, while the arithmetic mean was 8.87 ($SD=2.40$). The frequency range of results for students at the University of Osijek was between 8 and 13, with the most frequent score being 12 ($Mo=12$, $f_{max}=22$), representing 49% of students, while the arithmetic mean was 11.51 ($SD=1.13$). At the University of Split, the frequency range of student results was between 5 and 13, with the most frequent score being 11 ($Mo=11$, $f_{max}=12$), representing 35.3% of students, while the arithmetic mean was 10.08 ($SD=1.57$).

To test the first hypothesis of this study, which proposed that there was no statistically significant difference in students' perceptions of teaching based on the university they attend, non-parametric statistics and the Kruskal-Wallis test were used. The test results showed no statistically significant difference between the groups, $H(2, N = 42) = 2.56$, $p > 0.05$. Therefore, the first hypothesis is confirmed, as there is no significant difference between the groups of students based on the university they attend.

Table 2.

Percentage of frequency of scores on the DASTT-C checklist for 2nd-year students

Score on DASTT-C checklist	2 nd -year students		
	Zagreb $f(\%)$	Osijek $f(\%)$	Split $f(\%)$
0	0	0	0
1	0	0	0
2	0	0	0
3	2.1	0	0
4	6.4	0	0
5	2.1	0	2.9
6	6.4	0	2.9
7	8.5	0	0
8	12.8	4.4	2.9
9	14.9	0	20.6
10	17	11.1	23.6
11	19.2	22.2	35.3
12	8.5	49	8.9
13	2.1	13.3	2.9
Total	100	100	100

The frequency results in percentages are presented graphically to provide clearer insight into students' perceptions and the differences among them (Figure 1).

The curves for students from all three universities are shifted to the right, indicating that second-year students of the 2022/23 generation predominantly perceive teaching as teacher-centred.

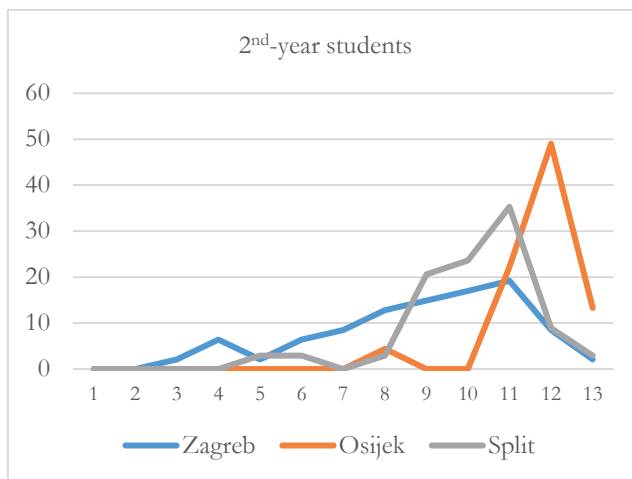


Figure 1.

Graphic representation of f (%) for 2nd-year students

The DASTT-C questionnaire determines students' placement within one of three categories along the continuum of teaching theories based on their total score (Table 3). Table 3 shows that 8.5% of students from Zagreb perceive teaching as student-centred, while no students from Osijek or Split fall into this category. At all three universities, a high percentage of students, 100% in Osijek, perceive teaching as Decimals in this table need to be periods and not commas. These findings were unexpected, as the same research was conducted at Croatian universities 11 years ago (Škugor, 2013).

A decade ago, second-year students most often depicted themselves in the teacher-centred category, but a higher percentage also placed themselves in the student-centred category or in a category that did not align strictly with either approach. Therefore, similar or improved results had been anticipated. Despite educational reforms and the introduction of new curricula (2019) emphasizing constructivist teaching theories and inquiry-based teaching, student perceptions have shifted even more toward teacher-centred approaches, maintaining the traditional teacher role. These results align with findings from other studies (Louca et al., 2002; Talsma, 2007; Tatar et al., 2012), which suggest that students, before enrolling in methodology

courses, tend to perceive teaching as teacher- Decimals in this table need to be periods and not commas because their beliefs about teaching are shaped by their previous schooling experiences. Choi and Ramsey (2010) highlight that elementary school teaching continues to follow a traditional model with the teacher at the Decimals in this table need to be periods and not commas, which corresponds to the way students depict teaching in their drawings.

Table 3.

Perception of teaching among 2nd-year students according to categories on the continuum

University	Student-centred teaching (%) 0 – 4 points	Non-specified orientation of teaching (%) 5 – 6 points	Teacher-centred teaching (%) 7 – 13 points
Zagreb	8.5	8.5	83
Osijek	0	0	100
Split	0	5.8	94.2

The analysis of the frequency of the evaluated indicators on all drawings by 5th-year students for the academic year 2022/23 revealed that the results ranged from 3 to 13 points. For drawings that scored zero points, no evaluated indicators were observed. At the University of Zagreb, the frequency range of the results for 5th-year students was from 3 to 13, with the most frequent score being 5 ($M_o = 5$, $f_{max} = 14$) for 17.1% of students, while the arithmetic mean was 6.84 ($SD = 2.51$). The frequency range of the results for students at the University of Osijek was between 5 and 13, with the most frequent score being 9 ($M_o = 9$, $f_{max} = 14$) for 27% of students, and the arithmetic mean was 8.80 ($SD = 2.11$). At the University of Split, the frequency range of student results was from 3 to 12, with the most frequent score being 9 ($M_o = 9$, $f_{max} = 6$) for 21.4% of students, and the arithmetic mean was 7.82 ($SD = 2.77$). In order to test the second hypothesis in this study, which stated that there is no statistically significant difference in the perception of teaching among 5th-year students depending on the university they attend, non-parametric statistics and the Kruskal-Wallis test were used. The test result showed no statistically significant difference between the groups, $H(2, N = 42) = 3.80$, $p > 0.05$, thus the second hypothesis is confirmed as there is no significant difference between the groups of students regarding the university they attend.

Table 4.*Percentage of frequency of scores on the DASTT-C checklist for 5th-year students*

Score on DASTT-C checklist	5 th -year students		
	Zagreb f(%)	Osijek f(%)	Split f(%)
0	0	0	0
1	0	0	0
2	0	0	0
3	4.9	0	7.1
4	14.7	0	10.7
5	17.1	7.7	10.7
6	12.2	7.7	7.1
7	13.4	11.5	7.1
8	8.5	15.4	3.6
9	8.5	27	21.4
10	12.2	3.8	14.3
11	6.1	15.4	14.3
12	1.2	7.7	3.6
13	1.2	3.8	0
Total	100	100	100

To provide a clearer insight into student perceptions of teaching and the differences among universities, frequency distributions expressed as percentages are presented graphically (Figure 2). The curves representing the results of fifth-year students from the universities in Zagreb and Split show a concentration of scores around the middle and a shift to the left, indicating a perception of student-centred teaching and an indeterminate teaching style. In contrast, the results of fifth-year students from the University of Osijek are shifted further to the right, suggesting that students perceive teaching as more teacher-centred.

Based on the total score, the distribution of students across the three categories on the teaching theory continuum was determined (Table 5). One in five fifth-year students from the University of Zagreb perceives themselves as a student-centred teacher with a constructivist and inquiry-based teaching style. However, half the students still perceive themselves within a traditional, teacher-centred style of teaching. At the University of Osijek, none of the students perceives themselves as favouring a student-centred teaching approach, with 84.6% depicting a traditional teaching paradigm. At the University of Split, 17.8% of students perceive themselves within a student-centred teaching approach, while the same percentage represents a

conceptual teaching style that is not yet sufficiently constructivist, whereas 64.4% depict a traditional teaching paradigm.

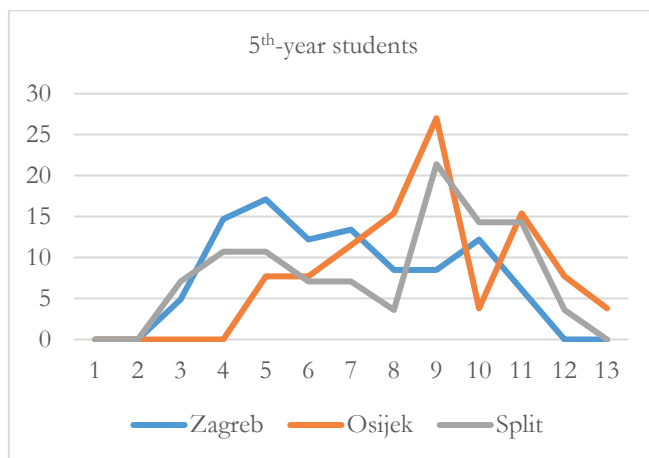


Figure 2.

Graphic representation of f (%) for 5th-year students

When comparing the results of second- and fifth-year students from the 2022/23 cohort, a slight shift toward the middle and left side of the continuum is observed among fifth-year students, indicating a move toward a student-centred paradigm and a constructivist teaching style. These findings align with previous research (Louca et al., 2002; El-Deghaidy, 2006; Talsma, 2007; Minogue, 2010; Ambusaidi and Al-Balushi, 2012; Tatar et al., 2012; Lay and Khoo, 2013; Buldur, 2017), which suggests that students revise their beliefs and mental representations of teaching after completing methodology courses, teaching demonstration lessons, and professional teaching practice.

Table 5.

Perception of teaching among 5th-year students according to categories on the continuum

University	Student-centred teaching (%) 0 – 4 points	Non-specified orientation of teaching (%) 5 – 6 points	Teacher-centred teaching (%) 7 – 13 points
Zagreb	19.6	29.3	51.1
Osijek	0	15.4	84.6
Split	17.8	17.8	64.4

When comparing the results of students from the 5th year, cohort 2022/23, with those from 11 years ago across the same three Croatian universities (Škugor, 2013), the results today show significantly worse outcomes for students at all three universities compared to the 2011/12 cohort. These results indicate a shift towards a traditional teaching approach, with students retaining the beliefs they held when they entered university and focusing on teacher-centred teaching. A comparison of these two cohorts also reveals differences based on the location of study. Eleven years ago, students from Zagreb and Osijek perceived their education as more student-centred compared to students from Split, who, at that time, also had a greater perception of student-centred teaching. By 2022/23, no student from Osijek perceived teaching as student-centred, while students from Split perceived it as more so than before. Although the current research results indicate a difference in teaching perceptions between 2nd and 5th-year students, as observed in previous studies, it is concerning that these results are notably worse compared to prior student cohorts. The question arises as to why 5th-year students maintain a traditional teaching approach and cannot move beyond the traditional paradigm. It is assumed that online teaching during the pandemic, for which neither teachers nor university staff were adequately prepared, could be among the causes. During the pandemic, students lacked teaching practice in schools and did not have demonstration lessons. As a result, they were deprived of direct experience working with students, as the teaching simulations conducted at universities or online were insufficient to alter their beliefs about teaching. The analysis of demonstration lessons in school serves as an opportunity for students to learn and engage in self-reflection, which was also missing. Šojat (2024) conducted a longitudinal study with future chemistry teachers from universities in Zagreb, Osijek, and Split, the findings of which are consistent with those of this study. The results show uniformity in student beliefs regardless of the university they attend, with a significant trend towards a traditional teaching approach. After completing methodology courses, there was a slight shift towards more student-centred teaching, but after teaching practice, the shift reverted towards traditional beliefs and teacher-centred teaching. This finding is explained by the influence of mentor teachers during teaching practice and of student-teacher interaction. Kind (2015) also reports that the practice and mentors themselves have a significant impact on students' beliefs and perceptions, especially when mentors' beliefs remain traditional. This could be another factor explaining the results of this research among future teachers, since most mentors in schools have 20 or more

years of experience and completed their formal education when the traditional teaching paradigm was prevalent, an alignment which they have not changed throughout their professional development. Contrasting experiences regarding beliefs and changes in mental models during teaching practice are reported by El-Deghaidy (2006), Liaw (2009), Mensah (2011), Tatar et al. (2012), and Turkmen and Unver (2018), who highlight that students receive support from mentors to apply what they have learned in practice. A third potential cause for these research results may be explained by the findings of Prosser and Trigwell (2002), who argue that students who were taught in teacher-centred classrooms during their previous schooling reject modern teaching methods in which they actively participate in the learning process. They find it more acceptable to receive ready-made information to learn, rather than engaging in independent research and drawing conclusions.

Conclusion

In the Croatian education system, the constructivist approach to teaching and the student-centred paradigm have been present for the past two decades. The most recent educational reform in 2019 introduced a new curriculum for the subject of “Nature and Society”, emphasizing a constructivist approach to teaching that focuses on experiential, research-based, and problem-solving methods, with student-centred approaches ensuring an active role for students in learning. The results of this research provide insight into the complexity and interconnectedness of teaching and learning at all levels of education and during teachers’ professional development. Additionally, the results highlight the need for more intensive collaboration between university faculty and schoolteachers to transfer and sustain changes in practice. The perceptions and beliefs of student teachers about the teaching of “Nature and Society” are not aligned with curricular requirements and the needs of today’s students. The results show uniformity in 2nd and 5th-year students’ perceptions of teaching, regardless of the university attended, with a significant tendency toward teacher-centred teaching. Students at the University of Zagreb show a slight tendency toward student-centred teaching in both the 2nd and 5th years, but without statistically significant differences when compared to students from Osijek and Split. Fifth-year students at all universities show a slight departure from the traditional paradigm towards conceptual teaching, which is still insufficiently constructivist, compared to 2nd-year students. The students of the

2022/23 cohort showed significantly worse results compared to students from 11 years ago, when the first study was conducted. The results suggest that future teachers still perceive themselves as central to the teaching process, which is the result of beliefs formed during their previous education. With this perception of teacher-centred teaching, the 5th-year students will soon enter classrooms and design and implement teaching scenarios. During demonstration lessons in schools, students need to be encouraged to analyse and reflect on their beliefs about teaching, which they will eventually transfer into their practice. Self-reflection, along with continuous support through various forms of professional development, is also crucial for teachers. School-based mentors, particularly those with over 20 years of experience, are often trained in the traditional paradigm and play a significant role in guiding students during teaching practice. As a result, students tend to revert to the old paradigm if their beliefs have not been internalized into their belief system. Therefore, the change in teaching paradigms should be considered in a broader context encompassing all levels of education and continuous professional development for teachers. Future research like this could be useful when conducted with trainee teachers and educators to help them recognize and, if necessary, alter their teaching beliefs. It would also be beneficial to carry out such research every five years during preservice education at all Croatian universities to monitor trends in the changes in student perceptions of teaching and draw more specific conclusions about what is happening and why, enabling the implementation of targeted measures.

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