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SCIENCE TEACHERS' PERCEPTIONS OF THEIR FACULTATIVE PEDAGOGICAL EDUCATION: THE CASE OF THE FACULTY OF SCIENCE AT THE UNIVERSITY OF KRAGUJEVAC

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Introduction

In the past two decades, numerous studies on initial teacher education in Serbia have indicated a need for the development and improvement of teachers' pedagogical competencies (Pantić & Wubbels, 2010; Protner *et al.*, 2014; Radišić *et al.*, 2012; Zgaga, 2006). The 2009 Law on the Fundamentals of the Education System defined an MSc degree as a prerequisite for teaching science at schools, along with a minimum of 30 ECTS credits in pedagogical, psychological, and didactic content and 6 ECTS credits of practice. The latest addition to the Law was made in 2017, requiring prospective teachers to acquire a minimum of 6 ECTS credits each in psychological, pedagogical, and methodical disciplines within the prescribed 30 ECTS credits as well as 6 ECTS credits of school practice. In the Competency Standards for the Teaching Profession and Teacher Professional Development, pedagogical competencies are defined within K2, K3, and K4 (Rulebook on Competency Standards for the Teaching Profession and Teacher Professional Development, 2018).

The Faculty of Science at the University of Kragujevac has implemented the changes prescribed by the Law. With every new change, the accreditation of the corresponding study program has been changed in the shortest possible time. In accordance with the last amendment to the Law and the requirement that prospective teachers acquire at least 6 ECTS credits in pedagogical content, the accreditation was changed in 2019. Now, prospective science teachers can take different pedagogical courses (Pedagogy, School Pedagogy, and Andragogy). Previous accreditations provided prospective teachers with only 4 ECTS credits in pedagogical content. The official requirement that all teachers must have an MSc degree and a minimum of 6 ECTS credits each in psychological, pedagogical and methodical disciplines within the previously prescribed ECTS credits (30 ECTS credits + 6 ECTS credits of school practice) resulted in a great number of graduated science teachers that did not qualify for the professional exam.

Since 2009, 75 science teachers (62 female and 13 male) took facultative pedagogical courses at the Faculty of Science in Kragujevac. They graduated from different study programs (Chemistry, Mathematics, Physics, Informatics, Biology and Ecology) at different faculties (Faculty of Science, Faculty of Engineering Sciences, Faculty of Medical Sciences, Medical College of Applied Sciences) in the period from 1998 to 2020. All of them took one or more facultative pedagogical courses. Pedagogy was chosen by 70 science teachers, while fewer teachers chose the remaining two subjects (School Pedagogy– 16; Andragogy– 3). Only two teachers studied all three subjects,

eight science teachers chose two (Pedagogy and School Pedagogy), whilst the remaining teachers took one course (Pedagogy-61, School Pedagogy-7, Andragogy-1). At first, science teachers only took the Pedagogy course. However, since they are now required to have more ECTS credits in pedagogical content, they need to take two or more courses.

Research Aim

The aim of this study was to explore science teachers' perceptions and evaluations of the process of taking facultative pedagogical university courses as in-service teachers.

Method

A qualitative study was conducted on a sample of teachers who took a facultative pedagogical course at the Faculty of Science at the University of Kragujevac. Semi structured interviews were conducted, and the data were gathered during September 2022.

The sample comprised 5 female teachers aged between 30 and 49, with work experience ranging between 2 and 9 years. Four participants were Chemistry teachers and one taught Mathematics. Two participants were grammar school teachers and three taught at primary schools. Participation in the interviews was voluntary and anonymity was guaranteed to all interviewees, with the assignment of different letter and number combinations to be used when referring to their statements. The interviews took approximately 50 to 60 minutes and were recorded and transcribed with interviewees' permission. A qualitative thematic content analysis was conducted (Braun & Clark, 2006). In-depth analyses of the transcribed material were undertaken in order to gain insight into its content, followed by the extraction of key meanings and messages from the text and the grouping of created codes into conceptual categories that led to the classification of categories into themes through constant comparison of the data (Charmaz, 2006).

Results and Discussion

The implemented methodology revealed that teachers' answers could be analyzed in three sections: demanding educational administration and its reflections on teachers' education; pedagogical education as a means of overcoming shortfalls in professional identity, and teachers' responsibility in the process of their continuing professional development.

Demanding Educational Administration and its Reflections on Teachers' Education.

Four teachers involved in this research explained that they were informed about the lack of ECTS credits in pedagogical contents when they applied for the professional exam. The school secretary informed them about receiving a note from the Ministry of Education, Science and Technological Development (MoESTD) that stated that "the candidate does not meet the prescribed criteria for taking the professional exam".

“In 2019, I finished my internship. Then the secretary submitted a request to the MoESTD, and in August 2022, the Ministry rejected the request because I lacked 2 ECTS credits in pedagogical subjects, so I could not take the professional exam.” (CHT3)

Only one teacher stated that nobody at her workplace explained the requirements for the professional exam. Moreover, when she applied for the job, the school administration only asked for an MSc degree, omitting the mandatory requirement regarding ECTS credits. However, this teacher sought information from the Faculty of Science and then voluntarily took supplementary pedagogical exams. The obtained results are in line with previous studies showing the importance and impact of the school management and educational administration on teachers' motivation and incentive for continuing professional development (Ovesni, Hebib & Radović, 2019). The results further suggest that the educational policy has a direct influence on the school practice and even affects the chances of getting and keeping a permanent job (ETF, 2018).

Pedagogical Education as a Means of Overcoming Shortfalls in Professional Identity.

Our results showed that all interviewees perceived their pedagogical education as a means of overcoming shortfalls in their professional identity. The teachers particularly emphasized topics related to marking students, making lesson plans, and creating Individualized Education Plans.

“I saw the benefit of attending pedagogical courses, of course, especially on topics related to the standards of achievement, methods of assessments, devising tests, and the scoring scale.” (CHT1)

“Knowing the point of formative assessment is something that I learned in this course and I did not understand it until now”. (MAT1)

The teachers stated that they required knowledge that goes beyond curricular content. The obtained results are similar to previous studies indicating that initial teacher education has mostly been oriented toward developing competence in the content knowledge and competence in transferring the knowledge (Radišić *et al.*, 2012). Likewise, studies have shown that teachers can be unsure when marking students, suggesting that further support could facilitate the process of assessment and evaluation (Maksimović & Ćosić, 2019). The collected data reflect the idea that education is a dynamic process that requires a constant improvement of teachers' knowledge, skills, attitudes, and values. Furthermore, teachers need to transform their professional identity in order to efficiently adapt to educational reforms (Vujisić-Živković & Vranješević, 2019).

Teachers' Responsibility in the Process of Their Continuing Professional Development.

Our participants saw passing exams in pedagogical courses as a remarkably important form of professional development.

"For me, returning to the Faculty of Science has been the most important form of professional development. It has allowed me to see my job from a different perspective." (CHT2)

However, four out of five interviewees stated they experienced some form of anxiety upon returning to study at the University. This finding is similar to the results of Baharudin, Murad and Mat's (2013) research on adults who return to the faculty.

"I was a bit fearful when I returned to study, but I found it comforting that it was my home university. I worried about getting embarrassed at my age; I panicked a bit." (CHT1)

Still, after they passed their exams, the teachers stated that they saw multiple benefits of taking the courses. One teacher said:

"I even considered taking some new facultative pedagogical courses that have been introduced after the new accreditation cycle". (CHT4)

All interviewees asserted that they were aware of the need for continuous professional development in the field of pedagogy. Furthermore, they highlighted the need for systematic support and well-designed and continuous assistance. Previous studies have reported similar opinions underlining the importance of teachers' active participation in the creation and implementation of models of professional development (Anđelković, 2017; Dimitrijević, Đurđević-Nikolić & Petrović, 2020; Ovesni, Hebib & Radović, 2019; Pešikan, Antić & Marinković 2010, 2010b). Studies have shown that teachers need to be ready to continuously learn and improve different skills and knowledge, because no teacher education program could prepare future teachers for each and every professional challenge they might need to cope with during their career (VujisićŽivković & Vranješević, 2019).

Conclusion and Recommendations

Understanding teachers' perceptions is of paramount importance for the formulation and implementation of future changes and the provision of adequate support to prospective teachers. In spite of the limited sample size, the authors believe that the obtained data shed light on issues that teachers perceive as important for their work. Based on the results, the curriculum of pedagogical subjects at the Faculty of Science should be developed and improved so as to involve more thematic areas related to (self)evaluation, teachers' professional development, and models of in-service teacher education.

Keywords: pedagogical education, science teachers, professional development.

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