

Scientific paper

The Self-Evaluation of Slovenian Prospective Chemistry Teachers' Progress During Their Practical Pedagogical Training in Primary Schools

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Abstract

The present research deals with the self-evaluation of prospective chemistry teachers' progress during their practical pedagogical training (PPT) in primary schools.

The sample consisted of 42 students from the 3rd and 4th years of the undergraduate programmes "Chemistry and Biology" or "Chemistry and Physics" at the Faculty of Education, University of Ljubljana. For the purpose of the investigation, the students completed questionnaires after each day of their practical pedagogical training, and at the end the entire training wrote reflective essays about their most significant experiences.

Analysis of the results reveals that the students believe that practical pedagogical training makes a crucial contribution to their practical pedagogical education in the light of their future profession. The students also reported on their progress concerning the various skills that were developed.

Keywords: Chemistry teacher education, practical pedagogical training, prospective chemistry teachers, teacher training, teachers' efficacy

1. Introduction

Malderez et al.¹ consider the development of a professional identity as a core aspect and the overall aim of the teacher education programme. According to Wenger,² the process of learning is not simply the acquisition of skills and information, but also the process of forming a particular personality; or just the opposite: avoiding the formation of a particular personality. Similarly, the vital influence of the relationship between the teacher, students, colleagues, the mentor and the school community, as well as the influence of teacher educators as role models, is highlighted by Burn.³

In the tertiary education of prospective teachers, practical pedagogical training is viewed as one of the most important components of preparation for their future work.^{4,5} In the elaborated literature review by Trevisian,⁵ the exceptional importance of practical training experiences in evaluation is pointed out. Trevisian reports about recommendations made regularly and consistently in the literature, placing particular importance on hands-on eva-

luation or practical experience for students. Similarly, Chelimsky⁶ emphasises the importance of realistic training when teaching evaluation, which, in addition to didactic course work, includes hands-on evaluation experience as a crucial part of practical training for students. It is important that during PPT students integrate their didactical knowledge in their teaching.⁷ For example, Koç and Yildiz⁸ found in their study that prospective teachers encountered problems in planning and facilitating the instruction process, and also in classroom management during their PPU. In addition, prospective teachers reported that they experienced contradictions between what they learned at the university and what they practiced in the schools.

In the analyses of chemistry lessons used by preservice chemistry teachers during PPT, Ferik Savec and Wissiak Grm⁹ found 11 categories of student-centered learning methods. e.g. 1) Discussion between pupils and teacher based on pupils' everyday experiences and observations; (2) Activities based on games, rebuses, stories, cartoons, movies; (3) Work with models in groups of pupils,

accompanied by discussion of results and observations; (4) Teacher's presentation of models, accompanied by pupils' interpretation of observations; (5) Presentation of animation of a chemical reaction and its interpretation by pupils' active involvement; (6) Experimental work in groups of pupils, with an explanation of the results and observations; (7) Demonstration of a chemical experiment with cooperative explanation of results and observations; (8) Pupils learning through role playing; (9) Preparation of poster presentations in groups of pupils; (10) Cooperative solving of worksheets; and (11) Summarizing discussion between pupils and teacher and synthesis of knowledge gained.

In his research on preservice teachers' efficacy, Poulou¹⁰ points out some decisive factors. According to Bandura,¹¹ there are four major influences on teachers' self-efficacy beliefs: master experiences, verbal persuasion, vicarious experiences and physiological arousal.

Among the factors that affect teachers' efficacy,¹² particular emphasis is placed on self-perceptions of teaching competence, personal characteristics, emotional and pedagogical support from fellow preservice teachers, as well as the preparation programme. In his study of the preservice teacher, Liaw¹³ reports and interprets the impact of both vicarious experience and verbal persuasion as resources for enhancing the level of efficacy when students perform a task in a group.

University collaboration with schools is therefore of great importance, in order to provide a real teaching context for preservice teachers. In this environment, preservice teachers can attain practical experience leading to performance accomplishment that will represent an influential resource in their future teaching experience.

In this regard, it is of great importance that the initial education of teachers has a significant role in the education programme in Slovenia's social context as well. According to Pulec Lah et al.,¹⁴ careful reflection on the existing practical pedagogical training of prospective teachers is required if we wish to achieve suitable starting points for modernising programmes. We believe that a key aspect in this regard is the direct experience of the prospective teacher for whom this practical pedagogical training is intended.

The present contribution therefore focuses on the feeling that preservice teachers have for their own progress in specific fields, and their reflections on the experience obtained during practical pedagogical training. Consequently, as teacher educators, we seek to make specific proposals regarding the modernisation of the existing practical pedagogical training, in order to compensate for the lack of practical experience in relation to theoretical content, topics and competences.

Our objective is to provide preservice chemistry teachers with profound knowledge gained in the realistic teacher training of evaluation, thus providing support in their future profession.

2. Context and Scope of the Study

At the Faculty of Education of the University of Ljubljana, Slovenia, the practical pedagogical training (PPT) of prospective chemistry teachers (students) commences in the 3rd year of tertiary education and continues in the 4th year. PPT is organised in collaboration between university teachers and selected primary school teacher-mentors. It is conducted in primary schools in the Ljubljana district and has a duration of five school days per year. Within the framework of PPT, students prepare lesson plans and teach chemistry in the 8th and 9th years of Slovenian primary schools (the pupils are 14–15 years old).

A member of the university staff has an advisory and assessment role, monitoring the students and, as necessary, guiding them in performing PPT. After the student has completed a presentation, the staff member, in collaboration with the other students, analyses and assesses the student's performance and proposes guidelines for improvement in the future. The role of the teacher-mentor (a chemistry teacher in an individual school) is to give directions prior to the commencement of PPT for successful inclusion in the current teaching plan, within the framework of which the students conduct and attend lessons during the time of PPT. The teacher-mentor is also present during all of the lessons that the student conducts and, directly after each lesson, provides the student with feedback on the positive aspects of the individual appearance, as well as on necessary improvements.

The described model of PPT has been used for many years. The present study was undertaken in order to obtain structured feedback from students, so that an attempt can be made in the future to improve PPT with regard to students' needs.

The study deals with the following research questions:

- (1) How do prospective chemistry teachers evaluate their development* during their practical pedagogical training?
- (2) What are students' general opinions about their practical pedagogical training?

3. Methods

3.1. Instruments

For the purpose of the investigation, special questionnaires for prospective teachers were developed and applied on a daily basis during the entire PPT.

* In the present article, we focus on the students' development from the perspective of eight specific characteristics, which are presented in the Instruments section. The full text of the essays and the questionnaires can be obtained from the authors.

3. 2. Questionnaire for Monitoring Students' Progress

The Questionnaire for monitoring students' process (of awareness of their own progress) by measuring influential characteristics through self-assessment during school practice was developed to assist students in reflecting on their own development during PPT, in particular from the following perspectives: (1) the prospective teacher's self-esteem while conducting the lessons, (2) the prospective teacher's ability to establish discipline in class, (3) the suitability of the prospective teacher's explanation of the topic taught, (4) the ability of the prospective teacher to anticipate the appropriate amount of matter to present during the lesson, (5) the prospective teacher's experimental skills, (6) the prospective teacher's expertise in providing an appropriate response to the students, (7) the prospective teacher's ability to involve students actively, and (8) the prospective teacher's self-dependence in preparing for the lesson. At the end of each day, the students evaluated each of the above listed specific characteristics with a mark in the range 1–5, whereby 1 represents the least progress and 5 the most progress. Questionnaire for monitoring students' process showed satisfactory internal consistency (Cronbach = 0.89), which is in range of similar questionnaires (e.g. Reardon et al., Adams et al.).^{15, 16}

3. 3. Students' Reflective Essays

During the week after PPT, the students were also asked to summarise their thoughts about their experiences in the form of a free reflective essay.

3. 4. Sample

The sample consisted of a complete generation of students enrolled in the 2008/09 academic year in the 3rd (N=15) and 4th (N=27) years of the undergraduate programmes "Chemistry and Biology" or "Chemistry and Physics" at the Faculty of Education, University of Ljubljana. All of the students involved were female and their average age was 24.1 years. Due to their future profession, the students are also referred to as prospective or preservice teachers in this paper.

3. 5. Data Collection

The students' practical pedagogical training (PPT) was conducted in April 2009 at seven primary schools in the area of the Ljubljana Urban Municipality, Slovenia. Students from the 3rd and 4th years spent one week (5 days) at a primary school to which they had been previously introduced. Groups of 2–3 students conducted PPT simultaneously at the same school.

Each student of the 3rd and 4th year independently monitored her own progress during PPT with the aid of a

questionnaire elaborated for this purpose. The questionnaire is presented in more detail in the Instruments section.

The 3rd and 4th year students each completed the aforementioned questionnaire before the start of PPT, and then each day during PPT after completing their obligations at school.

3. 6. Data Analysis

a) Analysis of the Questionnaire for monitoring students' process

The numeric results were entered into computer files, and calculations and figures were prepared in MS Excel and SPSS.

b) Analysis of the students' reflective essays

The large amount of data in the students' reflective essays was first analysed independently by both authors of the present article, in order to identify the natural units of meaning. The natural units of meaning that emerged from the described independent analysis were then unified through discussion, whereby units with similar meaning were amalgamated. In this way, for each of the questions in the reflective essays, codes were ascribed to each of the final natural units of meaning, enabling a coding table to be established. In order to ensure high reliability of categorisation, all reflective essays were re-evaluated, this time with the coding table, approximately one month after the first analysis. Altogether, 96% reliability was achieved in the repeat evaluation. Typical answers from students for each of the categories were selected.

4. Results and Discussion

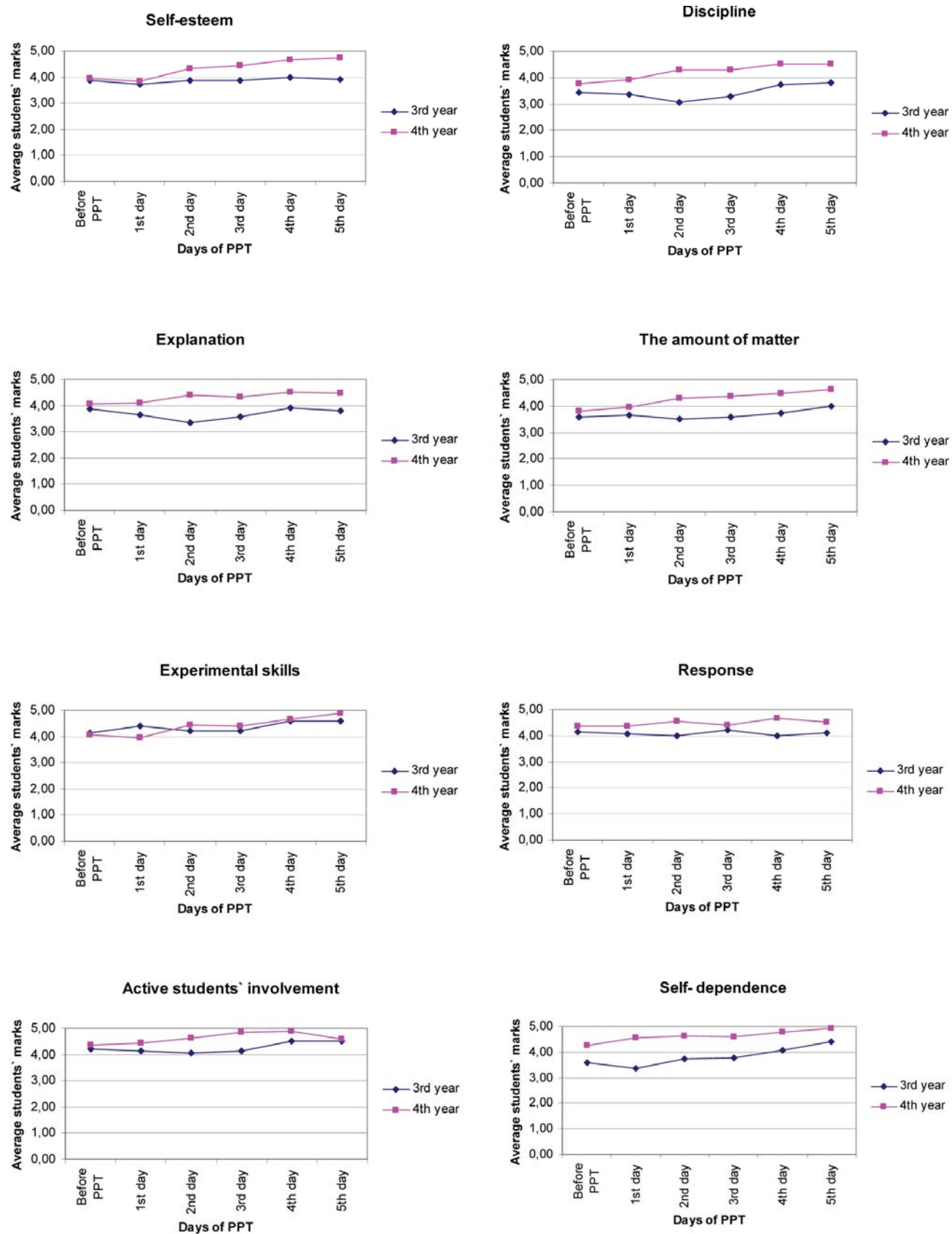
1st research question:

How do prospective chemistry teachers evaluate their development* during their practical pedagogical training?

4. 1. Average Students' Marks for Specific Characteristics During PPT

As can be seen from the graphic presentation in Table 1, students of both the 3rd and 4th years on average have a positive opinion about themselves as prospective teachers of chemistry, as they assessed themselves with an average mark higher than 3.

It can also be seen from Table 1 that 4th year students in general used higher marks than 3rd year students in assessing individual characteristics, both at the start of practice and during practice. The average marks of all characteristics for 3rd year students thus ranged between 3.72 (2nd day) and 4.14 (5th day), and for 4th year students between 4.07 (before practice) and 4.64 (5th day). Students of the 3rd and 4th years on

Table 1. Average marks for assessment of characteristics during practice by students of the 3rd and 4th years

average gave the highest mark on the last day of practice.

In terms of the specific characteristics, on average 3rd year students ascribed themselves the lowest mark, 3.45, for their capacity to establish discipline in a class; the same is true of 4th year students, who gave themselves the lowest mark, 4.16, for this characteristic (Table 2). The highest mark, 4.36, was given by 3rd year students for their experimental skills, followed by their capacity to involve pupils actively in the lesson, i.e., 4.26 (Table 2). The 4th year students also gave themselves the highest mark, 4.64, for this characteristic, followed by their self-dependence in preparing for the lesson, i.e., 4.56 (Table 2).

4. 2. Examples of Students' Progress

In order to provide a better insight into the typical process of the students' development, one example of the self-evaluation of a student from each of the 3rd (Table 3, Table 4) and 4th (Table 5, Table 6) years follows.

Table 2. Average results for specific characteristics for 3rd and 4th year students (for all days collectively)

Characteristic	3 rd year students		4 th year students	
	SD	Mean	SD	Mean
Self-esteem	3.86	0.09	4.24	0.34
Discipline	3.45	0.28	4.16	0.30
Explanation	3.69	0.21	4.28	0.21
The amount of matter	3.67	0.18	4.17	0.28
Experimental skills	4.36	0.20	4.30	0.29
Response	4.09	0.08	4.48	0.12
Active student's involvement	4.26	0.19	4.64	0.24
Self-dependence	3.82	0.37	4.56	0.19

4. 2. 1. Example of 3rd Year Student Andrea

It is clear from Table 3 and Table 4 that the student "Andrea" was sure of her experimental skills and ability to involve the pupils in lessons even before the start of prac-

Table 3. Andrea's self-evaluation of her skills and knowledge in specific fields – part 1

Timeline	Andrea's self-evaluation of her skills and knowledge	Thereby Andrea explained:
Before PPT		“Before the practice I was worried; experimental work concerned me least.”
1 st day		“I had difficulty today establishing order and discipline, the pupils should be more actively included in the lesson, but I managed to include an experiment in the explanation.”
2 nd day		Andrea explained: “I have not lectured today; I just attended two lessons of my peer students. I considered that it was easier to establish discipline in the class today.”

Table 4. Andrea's self-evaluation of her skills and knowledge in specific fields – part 2

Timeline	Andrea's self-evaluation of her skills and knowledge	Thereby Andrea explained:
3 rd day		<p>"I was afraid that I would not be able to teach with self-confidence, which was recognisable in the lesson. I was more self-confident with the experiment, so I did not have difficulty."</p>
4 th day		<p>"I had three hours of teaching today and it was very successful; I was pleased that I succeeded better in establishing discipline."</p>
5 th day		<p>"Similar to yesterday, it went quite well today. I have learned a huge amount in practice."</p>

tice, but that she had less confidence in herself in the areas of establishing discipline and self-dependence. In the first days of the course of practice, her self-confidence in the area of her ability to establish discipline dropped further; similarly, she began to believe less in her ability to explain the teaching matter adequately. During the time to the end of practice, however, her self-confidence improved significantly in all fields, achieving a mark of 4 or 5.

4. 2. 2. Example of 4th year student Tina

It can be seen from Table 5 and Table 6 that the student "Tina" was very self-critical before the practice. She was only sure that she was sufficiently self-dependent for preparing and conducting a one-hour lesson, but had very little self-confidence in the areas of her own self-confi-

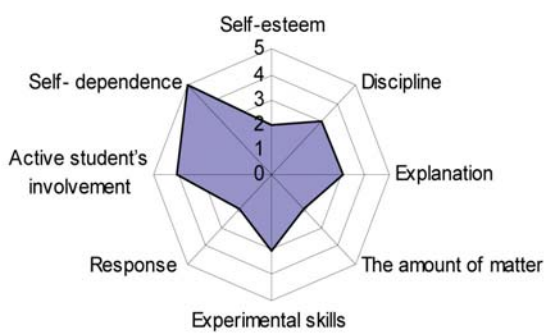
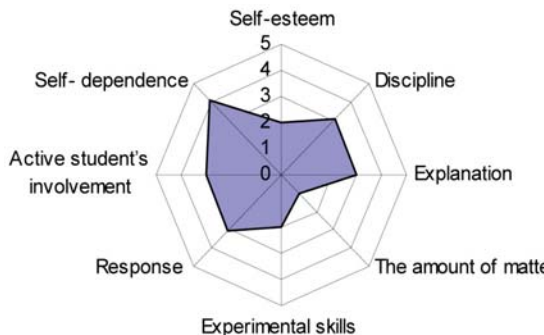
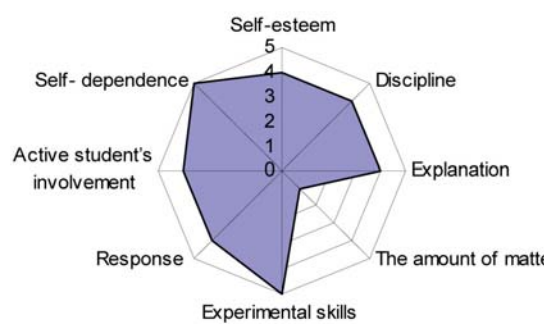
dence in presentation, her ability to judge correctly the amount of material to cover in a one-hour lesson, and her ability to respond adequately to events in class. It is evident that her feelings in all of these areas changed significantly during the course of the practice in relation to the daily events, and she used marks from 1 to 4 for their description. On the last day of practice, she had a very successful presentation, which can be ascribed to the fact that her view of her own presentation improved significantly.

2nd research question:

What is the students' general opinion about their practical pedagogical training?

Analysis of the content of the essays showed that the students wrote mainly about the following areas: (1) gene-

Table 5: Tina's self-evaluation of her skills and knowledge in specific fields – part 1

Timeline	Tina's self-evaluation of her skills and knowledge	Thereby Tina explained:
Before PPT		<p>"I am well prepared for giving the lesson, but I have stage fright – probably due to a lack of experience."</p>
1 st day		<p>"It seemed to me that I had prepared too much for the teaching hour and I ran out of time. After one hour of teaching, because of the simplicity of my own experiment, I had calmed down a little because my fellow students had similar difficulties."</p>
2 st day		<p>"The fear of the first lesson was overcome, I really couldn't deal with the amount of material prepared in a one-hour lesson, and I like to include the pupils in the lesson. I performed the whole lesson independently and am satisfied with it."</p>

rally about the practice, (2) about the mentors and cooperating teachers, (3) about their own progress and fears, and (4) about experience gained with the pupils.

In the group of general comments about the practice, the majority of the students were very positive in their essays regarding the usefulness of the practice, describing it as a positive experience, and in some cases even as confirmation of the correctness of their choice of profession. In addition, a great many students stressed that they would like more practice. In relation to the form of carrying out practice, some students were more in favour of retaining the condensed form, while others would rather have had practice throughout the entire academic year (e.g., two school hours per week). Some students would also have liked the possibility of doing practice in several schools,

performing part of the practice with various teachers-mentors and thus becoming familiar with different approaches to teaching.



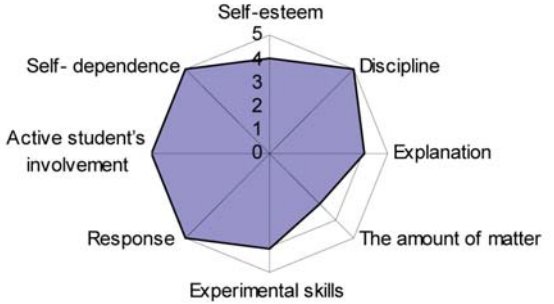
Example of a statement of a 3rd year student:

"It would perhaps be good if we could have performed practice in several schools, since in that way we could see several styles of teaching, whereas now we saw only one. We would also get to know more students (with a variety of difficulties)."

Example of a statement of a 4th year student:

"I had the feeling that I was going on practice having almost completed four years of training, having attended a whole pile of lectures on chemistry and performed laboratory experiments, of which there were a

Table 6. Tina's self-evaluation of her skills and knowledge in specific fields – part 2

Timeline	Tina's self-evaluation of her skills and knowledge	Thereby Tina explained:
3 rd day		<p>“In cooperation with fellow students, today I took several part lessons. It was very tiring for us because of the preliminary preparations, the teaching and maintaining discipline in the class.”</p>
4 th day		<p>“Because of the experience I have gained, I feel a little better. I also succeeded better in establishing discipline and activating the pupils.”</p>
5 th day		<p>“It was my second time giving the same lesson; the pupils from this class were willing to cooperate. They asked a lot of questions, which raised my self-esteem. Due to the experience already gained, I felt better able to anticipate the right amount of matter to present. I managed to reduce the stage fright, which also contributed to the clarity of the lesson.”</p>

considerable number. So a whole heap of knowledge but without any kind of experience of how to transfer this knowledge to pupils, how to motivate them to listen and cooperate, encourage them to think about questions in the field of chemistry. I am afraid that we came in front of the pupils with a lot of theory and too little practice. It is completely different if you yourself are sitting on a bench and listening to a lecture or communicating this knowledge yourself. Similarly, the experiments that you perform in the laboratory yourself (or with fellow students) are very different when you have to do them yourself in front of pupils. I am sure that the best solution for these difficulties would be longer condensed practice or practice spread out over the whole year, in which, already in 3rd year, it would help to attend some lessons of mentors, to prepare for lessons, to undertake group forms of work, perhaps

even to try to conduct part of a lesson alone. This would bring much more experience, so that in the 4th year, students would come to the assessed presentations with significantly more self-confidence and experience in working with pupils.”

The students wrote a great deal about the role of the teacher-mentor, who becomes a role model for many students. In addition to the importance of excellent preparation of the content by the teacher, the students also highlighted the importance of a correct attitude towards the pupils. On the other hand, some students were very critical in relation to the teacher's understanding of discipline in the class. The students also expressed the demand for obtaining concurrent feedback about their lesson presentations from the otherwise excellent teacher-mentors, who were clearly overburdened with other duties during the time of practice.

Example of a statement by a 3rd year student:

“I liked the fact that the mentor prepared a lot of experiments for the pupils, because we (students) could therefore be active, could ourselves try explaining, supervising... In addition to experimental work, we were also present during classic lessons. I noticed that the pupils had a good understanding with the mentor and respected her, although to me she did not seem strict enough.”

Example of a statement by a 4th year student:

“I was in general satisfied with the practice, for which a great deal of thanks are due to the mentor, her kindness and sincerity, and her capacity to give an opinion about the student’s performance taking into account the fact that we are beginners with a lot less experience than she has herself.”

Within the framework of the theme own progress and fears, students wrote that, thanks to the practice, they lost their fear of teaching chemistry and presenting experiments, and that they learnt to connect chemistry with everyday life, recognised the importance of the professional and methodological knowledge of the teacher, and experienced the fact that lessons do not necessarily always go according to plan, even if you are well prepared. Among the fears mentioned, the fear of failure in establishing discipline in the class was highlighted most frequently, a fact that students connected with a lack of motivation on the part of pupils.

Example of a statement by a 3rd year student:

“The most unexpected feeling was when I did not know how to establish order and I felt very ‘small’ against them, although one cannot allow that. However, as the saying goes, we learn from our mistakes. So already in the next lesson I did what I thought was right. The feeling then was completely different since I saw that I had decided correctly. When I succeeded in this, the pupils listened to me to the end, despite the fact that the teaching hour had actually finished. I was pleased then, because I knew that I had managed to attract their attention, which seems to me of most importance.”

Example of a statement by a 4th year student:

“The organisation of the Eco Day was a very special experience, in which we had to combine biological and chemical knowledge and, at the same time, master a group of pupils who differed in terms of age, knowledge and learning capacity. I think that I learned above all how important order is in the class, as it allows undisturbed work for both the teacher and the pupils. In terms of independent performances, it seemed to me most important of all that I learned from my own mistakes, and that I did not repeat the mistakes I had made in the previous class in dealing with the same teaching matter.”

In the area of experience gained with pupils, the students highlighted the fact that pupils expect the same ap-

proach from student teachers as they are accustomed to from regular teachers (both good and bad). The students also stated that pupils are, in principle, more peaceful and hardworking in schools in smaller places than in schools in Ljubljana, and that the working level of pupils falls from 7th to 9th grade. Some students also wrote that pupils lack basic knowledge not directly connected with chemistry, such as knowledge of calculating, as well as having poor expression, difficulties in reaching logical conclusions and poorly developed powers of observation. In relation to the popularity of experiments and the conscientiousness of pupils in independent experimental work, the opinions of the students were divided: some said that that pupils were skilful experimenters, while others stated the opposite. This probably depends on the method of work to which pupils are accustomed within the framework of regular chemistry classes.

Example of a statement by a 3rd year student:

“What was most unexpected for me was that pupils do not like experimental work, which was in complete contrast with my previous experience. With us (in a smaller place), pupils can barely wait to be able to do experiments and it is during this time that they are the most disciplined. It was not the same here. They considered experiments to be some sort of burden, which amazed me. The great majority just didn’t take them seriously.”

Example of a statement by a 4th year student:

“Pupils very much appreciated it if the whole class could take part in the subject matter (with the teacher’s explanation), not just the pupils in the front row but also those at the back and, especially, the “worst pupils” (pupils with concentration difficulties, lower learning capacity, etc.). I think that this helps a lot in maintaining discipline in the class. It also seems to me very important that the teacher recognises when to renounce his or her knowledge. With the right response, this does not reduce the teacher’s authority but increases it. It is important that the teacher encourages the pupil (it can even be the whole class) to seek answers, while at the same time seeking answers herself or himself.”

5. Conclusion

We first summarise the general opinion of the students, which we obtained with the aid of reflective essays. Our students believe that practice is not only an excellent experience, but also a necessary contribution to pedagogical training for their future profession. This standpoint is in accordance with the study of Timoštšuk et al.¹⁷ highlighting the considerable importance of developing more social aspects of learning to teach. In their study, the authors also claim that there should be stronger links between teacher education and the society in which students

will be expected to operate, in order to better understand the learning process. This is in line with the opinion of the majority of our students that PPT is the only proper way to really bring them close to their life profession. The students also stress that there is decidedly too little practical pedagogical training, and they therefore suggest examining the value of devoting more hours to this kind of training.

Furthermore, our students stress how important it is to perform practice with a teacher-mentor who is experienced, innovative, effective and professionally proficient: a teacher-mentor who includes a lot of experimental work in lessons, uses up-to-date teaching methods, knows how to present teaching matter in an interesting way, is communicative, knows how to guide pupils well, works with pupils from the heart and is responsive to the reaction of pupils in a successful and fair way, knows how to establish discipline in the class, is prepared for various unexpected situations, and is self-sacrificing and capable of organising lessons well. Everything mentioned by our students relates to the issue of emotions stimulated by the complex relationships between teachers, students, colleagues and the teacher-mentor, which is mentioned as a very important issue in several studies.^{3, 18}

Our findings also indicate that the teacher educator has a crucial influence as a role model, which supports Timošćuk's statement¹⁷ that students are acutely perceptive with regard to the influence of their teachers and expect them to be their role models.

At the start of practical pedagogic training, students often mentioned the initial discomfort and fear that accompany the first moments in the classroom, as well as the considerable difficulties in establishing contact with the pupils. However, after a week of practical pedagogical training, students normally report a lessening of these difficulties. Many students mention overcoming these difficulties thanks to the teacher-mentor as well as the university staff, and students largely appreciate the constructive criticism provided at the end of an individual performance by both the teacher-mentor and the member of the university staff. These statements are in line with several studies^{19, 20} suggesting that methods such as guided practice in a group format and an opportunity to observe a proficient experienced teacher, as well as school-university collaboration in teacher training programmes, increase teachers' level of self-efficacy. In addition, the students propose: (1) longer PPT, (2) commencing PPT in the 1st year and not just in the 3rd year, (3) independent choice of location and school for PPT, and (4) the possibility of doing PPT in several schools in cooperation with a number of different teacher-mentors.

With regard to the eight specific characteristics studied in the present research, on average 3rd year students gave themselves the lowest mark for their ability to establish discipline in class, and a similar attitude was also found with 4th year students. The highest mark was given

by 3rd year students for their experimental skills, followed by their ability to actively involve pupils in the lesson. A similar attitude is found with 4th year students, who also gave themselves the highest mark for experimental skills, followed by their self-dependence in preparing for the lesson.

At the end of practical pedagogic training, the students report on newly obtained professional and pedagogic experience, important insights into teaching and the mostly pleasant impressions that they obtain of work in schools during practical pedagogic training. The students' perceptions are in line with the observations of Malderez,¹ who was aware that becoming a student teacher is a highly emotional experience encompassing both negative and positive emotions. Our future work should therefore be oriented towards retaining all of the features of practical pedagogical training of preservice chemistry teachers that unequivocally contribute to preservice teachers' level of self-efficacy. Furthermore, our sustained efforts will be focused on fruitful school-university collaboration, which can undoubtedly contribute considerably to preservice teachers' feeling of support of the professional community, enabling them to better cope, learn and grow as future teachers.

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Povzetek

V prispevku smo želeli predstaviti pogled bodočih učiteljev kemije na lastni napredek med opravljanjem Praktičnega pedagoškega usposabljanja (PPU) na osnovnih šolah.

Vzorec obsega 42 študentov 3. oz. 4. letnika dodiplomskega študijskega programa Kemija in biologija oz. Kemija in fizika na Pedagoški fakulteti Univerze v Ljubljani. Za namen raziskave so študenti svoj napredek spremljali po vsakem dnevu praktičnega usposabljanja na način, ki jim je na koncu praktičnega usposabljanja omogočal tudi podajanje refleksij o njihovih najpomembnejših izkušnjah.

Analiza rezultatov kaže, da študenti Praktično pedagoško usposabljanje pojmujejo kot enega izmed ključnih prispevkov v procesu njihovega pedagoškega usposabljanja. Prav tako menijo, da so v času opravljanja prakse iz kemije imeli priložnost za pridobivanje različnih strokovnih znanj, pomembnih za opravljanje njihovega bodočega poklica.