

Received: 20 March 2025, Accepted: 17 October 2025

DOI: <https://doi.org/10.26529/cepsj.2109>

The Factors Influencing the Process of Deciding Whether to Become a Computer Science Teacher

VÁCLAV DOBIÁŠ^{*1}, VÁCLAV ŠIMANDL² AND MARTIN KOUŘIMSKÝ³

Choosing a future profession is an important step in life, and the decision to become a teacher is widely discussed in the literature. However, pre-service computer science teachers hold a unique position, as they are highly employable in the information technology job market, and this may have an impact on the decision to choose teaching as a career. The present research aims to clarify the decision-making process of becoming a computer science teacher and the factors that influence it. The qualitative research inspired by the constructivist grounded theory involved semi-structured interviews with 18 first-year pre-service computer science teachers. Through a questionnaire developed for this sample, the findings from the qualitative research were quantitatively verified on 69 respondents. The key choice is whether to become a teacher. Pre-service teachers are motivated by external factors (length of holidays, job stability, flexibility and salary) and the desire to work with children. In contrast, they are demotivated by the negatives of being a teacher, particularly by concerns about pupils (especially their behaviour) and parents. After deciding to study teaching, pre-service teachers need to make a decision about their specialisation. This is influenced by the high school they attended, their relationship to computer science, their former teachers, strategic reasons (believing this specialisation to be an easy way of getting the degree or a job after graduation), gender stereotypes (especially among women), and their expectations about teacher education in computer science.

Keywords: computer science teacher, pre-service teacher, deciding on a teaching career, computer science education

1 *Corresponding Author. Faculty of Education at the University of South Bohemia, České Budějovice, Czech Republic; dobias@jcu.cz.

2 Faculty of Education at the University of South Bohemia, České Budějovice, Czech Republic.

3 Grammar school of Písek, Czech Republic.

Dejavniki, ki vplivajo na odločitev za poklic učitelja računalništva

VÁCLAV DOBIÁŠ, VÁCLAV ŠIMANDL IN MARTIN KOUŘIMSKÝ

≈ Izbira poklica za svojo prihodnost je pomemben korak v življenju vsakega posameznika, odločitev za poklic učitelja pa je v literaturi široko obravnavana. Bodoči učitelji računalništva imajo pri tem edinstven položaj, saj so na trgu dela v informacijski tehnologiji visokozaposljivi, kar lahko vpliva na odločitev za poklic učitelja. Namen te raziskave je pojasniti proces odločanja za poklic učitelja računalništva in dejavnike, ki vplivajo nanj. Kvalitativna raziskava, ki je temeljila na konstruktivistični utemeljeni teoriji, je vključevala polstrukturirane intervjuje z 18 bodočimi učitelji računalništva v prvem letniku študija. Z vprašalnikom, razvitim za to skupino udeležencev, so bili izsledki kvalitativne raziskave kvantitativno potrjeni na 69 udeležencih. Ključna odločitev je, ali postati učitelj. Bodoče učitelje motivirajo zunanji dejavniki (dolžina počitnic, stabilnost zaposlitve, fleksibilnost in plača) in želja po delu z otroki. Nasprotno pa jih demotivirajo negativne strani učiteljskega poklica, zlasti skrbi v povezavi z učenci (predvsem njihovim vedenjem) in s starši. Ko izberejo izobraževalno smer študija, morajo sprejeti še odločitev o specializaciji, tj. predmetu, ki ga bodo poučevali. Na to vplivajo: srednja šola, ki so jo obiskovali, njihov odnos do računalništva, njihovi nekdanji učitelji, strateški razlogi (prepričanje, da je ta specializacija lahek način za pridobitev diplome ali zaposlitve po diplomu), spolni stereotipi (zlasti med ženskami) in njihova pričakovanja glede izobraževanja učiteljev računalništva.

Ključne besede: učitelj računalništva, bodoči učitelj, odločitev za poklic učitelja, računalniško izobraževanje

Introduction

As claimed by Moses et al. (2017, p. 444), “understanding student-teachers’ decisions to enter and stay in the teaching profession after graduation could help teacher educators to find appropriate procedures to enhance commitment to teaching”. The decision to become a teacher has been described in general terms by many authors; See et al. (2022) have identified 517 papers on this topic. The motivators that influence this decision-making process can be divided into personal and extrinsic. Personal motivators include perceptions of the profession (Butler, 2021; Nur Fitria, 2023; Watt & Richardson, 2008), altruism (Wang & Wang, 2022; Yong, 1995) and personal fulfilment (Knell & Castro, 2014). Extrinsic motivators include social norms and expectations of the teaching profession (See et al., 2022), teacher role models (Daud, 2021), benefits of the teaching profession, such as job stability and income (Everson & Ko, 2022; See et al., 2022), and the amount of free time (Richardson & Watt, 2005). These motives may be further influenced by teacher education (Bruinsma & Jansen, 2010; Teng, 2017). However, some novice teachers enter the profession without a commitment to stay (Plunkett & Dyson, 2011), which may further exacerbate the teacher shortage (Fokkens-Bruinsma & Canrinus, 2012a).

According to Bergmark et al. (2018), there are four motives that lead to enrolment in teacher education: (re)creating the caring school, fostering the upright human being, creating a desirable (professional) life, and forming valuable knowledge. Other authors attempt to describe the diversity of factors motivating people to become teachers. Watt and Richardson (2008) have developed a multidimensional model called FIT-Choice. Motivators in this model include the perception of the teaching profession, specifically the job requirements (e.g., a high level of expertise) and the job benefits (e.g., relatively good salary or social status) (Watt & Richardson, 2008; Watt et al., 2012). Other researchers have investigated the significance of factors within the FIT-Choice model (Fokkens-Bruinsma & Canrinus, 2014). Based on the FIT-Choice model, diagnostic and research tools have been developed in some countries to measure motivation for choosing the teaching profession (Fokkens-Bruinsma & Canrinus 2012b; Hennessey & Lynch, 2016; Kılınç et al., 2012; Tomšík, 2019).

Gender is an important factor in choosing a teaching career. Different motivators to become a teacher prevail for each gender (See et al., 2022). According to Keck Frei et al. (2017), the main motivator for men is a good match between their interests, skills and future profession. Most men who choose to become teachers have family members who are teachers, and thus are supported in their choice (Keck Frei et al., 2017). As claimed by See et al. (2022, p. 1),

“men are reported to be more strongly influenced by social norms and expectations and were less likely to choose primary and early years teaching. Women are also more likely to experience higher levels of career satisfaction and less social dissuasion than men”.

Saqipi and Vogrinc (2021, p. 5) claim that “the importance of studying teachers’ personal and professional identities has gained significant attention in recent decades, given the need to understand better the rationale behind teachers’ behaviour in their tasks”. Teachers’ identities are deeply embedded in their personal biographies (Bukor, 2015). As stated by Bukor (2011, p. iii), “it is essential to explore teachers’ personal life experiences in order to gain a holistic understanding of the dominant influences on the development of teacher identity”. Teacher identity is considered an important aspect of becoming a teacher (Butler, 2021), and future teacher identity is likely to be formed in the process of deciding whether to enter teaching. This identity is further shaped by the study of teacher education (Butler, 2021; Pappa & Moate, 2021) and practice (Torres-Cladera et al., 2021).

Many computer science teachers leave the education sector after graduation (Průcha, 2023; Yadav et al. 2022). This is one of the factors contributing to the shortage of computer science teachers. Let us illustrate this with reference to the situation in the Czech Republic. In lower secondary schools, computer science is taught by 6,200 teachers (Ministry of Education, Youth and Sports of the Czech Republic, 2025). In 59% of lower secondary schools, computer science lessons are taught by teachers who do not have the education to teach this subject (Czech School Inspectorate, 2024), and 8% of computer science teachers in primary and lower secondary schools do not have a university degree (Ministry of Education, Youth and Sports of the Czech Republic, 2025). In the upcoming school year, 730 computer science teachers will be needed (Ministry of Education, Youth and Sports of the Czech Republic, 2025). Although 14 faculties at 9 universities offer teacher education in computer science (Průcha, 2023), the number of graduates in computer science teaching is insufficient.

The context of the Czech education system

The school system in the Czech Republic is divided into three levels: primary school (grades 1–5 for pupils aged 6–10), lower secondary school (grades 6–9 for pupils aged 11–14), and high school (grades 10–13 for pupils aged 15–18). In primary school, one teacher teaches (nearly) all of the subjects in his or her class. In lower secondary school and high school, the teacher specialises in teaching one or two subjects. One usually becomes a teacher after graduating

from the faculty of education, where one can enrol in teacher education for primary school or teacher education for lower secondary school, with two specialisations (e.g., mathematics and computer science). Another common option is to enrol in teacher education for high schools at applied faculties.

Research problem

Although the general factors and motives that influence the decision to become a teacher are well described in the literature, the specific motivators that lead to teaching particular disciplines vary by discipline (Everson & Ko, 2022). Pre-service computer science teachers for lower secondary schools or high schools are in a unique position. Their studies have equipped them with skills that make them highly employable in the information technology job market (Průcha et al., 2019), which may have an impact on the decision to choose a teaching career. If we better understand why high school students decide whether or not to study teacher education in computer science, it will enable us to address the individual factors and increase both the quality and quantity of pre-service teachers and later teachers of this subject.

The present research aims to clarify the decision-making process of becoming a computer science teacher and the factors that influence it. Based on this, we created the following research question: What is the process of deciding whether to become a computer science teacher? Within this research question, we formulated the following sub-question: What factors influence this process?

Methods

The research was based on a mixed-method approach. While the qualitative part was intended to describe the decision-making process and the factors, the quantitative part was used to verify the qualitative findings. The research was conducted with Czech pre-service teachers.

Participants

The chosen research question led us to carry out qualitative research on pre-service computer science teachers for lower secondary schools. The research participants were in their first year of study and approximately 19 years of age. We decided on this age category because they had gone through the decision-making process of which profession to practice shortly before the research. Moreover, their perception of the teaching profession was still

minimally influenced by their university studies. A total of 18 students of the Faculty of Education at the University of South Bohemia and the Faculty of Education at the University of West Bohemia took part in the qualitative part of the research: 13 male students and 5 females students. At the beginning of the research, the simple random sampling method was used to select the participants. Later, participants who had the potential to help us to explain unexplored areas of the research were chosen.

A total of 69 participants took part in the quantitative part of the research, 23 of whom were women. The questionnaire was distributed to all first- and second-year pre-service computer science teachers at the Faculty of Education, University of South Bohemia. As we addressed 105 students, the return rate of the questionnaire was 66%.

Instruments

In order to be able to collect data in the qualitative part of the research, a basic outline of interviews was prepared (Birks & Mills, 2011; Švaříček & Šedřová, 2007). The outline contained 24 questions reflecting the research aim. The questions covered topics such as previous experience of working with children, relationship to computer science, description of the process of choosing whether to become a computer science teacher, expectations of the teacher education and teaching profession, and opinions on whether they will want to teach after graduation.

The quantitative part of the research involved a questionnaire survey including seven closed-ended questions, three open-ended questions and three questions containing together nine Likert scales. The questionnaire was created electronically using Google Forms and distributed to respondents by email. It is available in Czech from the corresponding author.

Research design

The qualitative part was inspired by the grounded theory approach. Since grounded theory is intended to describe a process, we believe that it is an appropriate way to address our research questions. Charmaz's approach was adopted for the implementation of the research (Charmaz, 2014; Mills et al., 2006; Šimandl & Dobiáš, 2021). Qualitative data collection involved interviewing the participants. At the start of each meeting, the researcher and the research project were introduced, anonymity was assured, and participants were asked for consent to participate and to have the interview recorded on

a Dictaphone. The interviews followed the outline (see above), but follow-up questions could be created and asked as needed during the interview in order to add depth (Charmaz, 2014). The average length of the interviews was 13 minutes. Quantitative data collection involved a questionnaire survey based on the prepared questionnaire (see above).

In the qualitative part of the research, the data analysis was based on the initial coding method. In order to ensure the validity of the research, it included the principle of constant comparison according to Charmaz (2014). The analysed text was divided into units that were assigned an appropriate code (Charmaz, 2014). The created codes were grouped into categories according to their internal similarity (Strauss & Corbin, 1990; Corbin & Strauss, 2008), and the emerging categories were arranged into a structure. Based on this structure, the final text was constructed, which forms the basis of the Results section below. To enhance credibility, the final text is documented by authentic citations of the participants, presented in italics with quotation marks.

Let us present an example of the data analysis. One of the participants claimed: *“What is good is the security of a stable income. You don’t have to worry about being redundant somewhere”*. During the initial coding, the code *“Job stability”* was assigned to this text. The same code was also assigned to other texts with a similar meaning. In this way, seven positive motivational factors in the data were identified and grouped into the category *“Positives of being a teacher”*.

The data obtained from the questionnaire survey were processed to find the frequencies of responses. Contingency tables were used for this purpose. In the case of the open-ended questions, open coding was performed at the beginning of the analysis. The contingency tables are available from the corresponding author.

Results

During their high school studies, students face the decision of which profession to practice, choosing a university and field of study accordingly. Thus, prospective pre-service teachers face two key decisions:

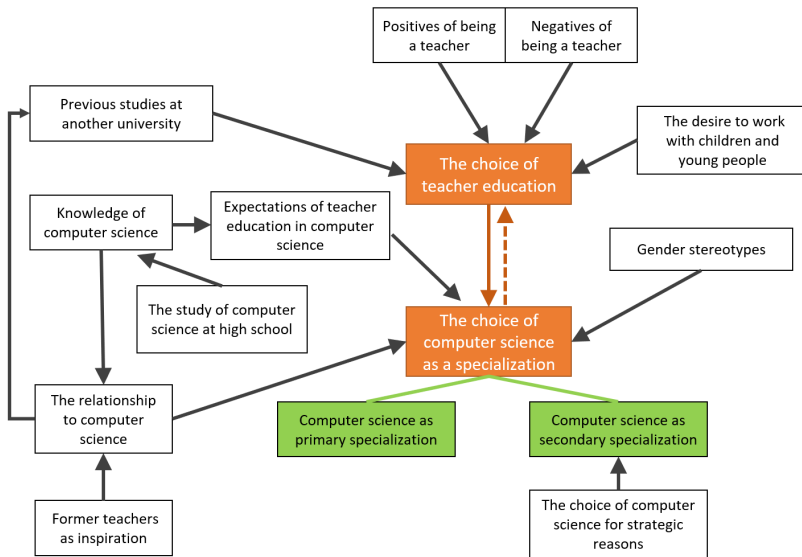
1. Whether to choose teacher education or to study another field.
2. Which two specialisations they want to teach if they decide to study teacher education for lower secondary schools.

Each of these key decisions is treated separately below. In this text, we describe the factors that influence participants to study teacher education in computer science for lower secondary schools, as summarised in Figure 1. The factors are

in white boxes and the key decisions are in orange boxes. Figure 1 was created on the basis of the structure that emerged during the qualitative part of the research.

Figure 1

Factors influencing high school leavers to study computer science teacher education for lower secondary schools



Unless otherwise stated, the results in this section are based on the qualitative part of the research, i.e., the interviews with 18 participants. The results of the quantitative part of the research (i.e., the questionnaire survey with 69 respondents) are always marked and are usually used to indicate the proportion of respondents expressing a certain opinion or experience.

The choice of teacher education

We first discuss the general choice of teacher education from the perspective of pre-service computer science teachers. The specificity of this group is shown by the results of the questionnaire survey: 46% of the respondents are considering a job outside education after graduation, 30% are not sure, and 23% are not considering such a job.

During the decision-making process, students take into account the supposed positives and negatives of the teaching profession, along with their

intrinsic motives, such as their desire to work with children and youth.

Expected positive and negative aspects of the teaching profession

One of the key influences shaping decisions about a future profession is the perception of the profession. This perception contains the perceived strengths and weaknesses of the profession, as well as some factors that are perceived ambivalently.

Positives of being a teacher: As the qualitative research shows, the expected benefits of being a teacher include length of holidays, job security and job stability. A welcome positive is longer holidays compared to other professions. Participants especially appreciate the summer holidays: *“I really like knowing when I will have time off. I like to travel (...)”* (Participant H).

Job stability and job security are mentioned by several participants. They are convinced that it will be easy for them to get and keep a job after graduation: *“What is good is the security of a stable income. You don’t have to worry about being redundant somewhere”* (Participant G).

Ambivalently perceived factors: The participants in the qualitative research differ on some aspects of being a teacher, including the public’s view of the teaching profession, the time demands of the profession and the salary. While some participants feel these are welcome benefits, others mention them more as factors that discourage them from becoming a teacher.

In relation to the public’s view of the teaching profession, one participant expresses that the teaching profession is highly prestigious and is viewed with respect: *“When you say teacher, it is ‘The teacher’, he is SOMEONE”* (Participant D). Many other participants perceive the teaching profession differently. An example of this is their fear of parents and pupils (see below) related to a perceived lack of respect for the profession.

Another ambivalent aspect is the time demands of the teaching profession. Some participants believe that teachers do not have much free time. According to them, they spend a lot of time at school or take their work home: *“Teachers have almost no personal life because they are either at the school or checking something”* (Participant O). Other participants perceive the time demands of the profession in terms of the number of hours they teach per week and the relatively short time teachers have to spend at the school. Some of them infer from this the possibility of having another job alongside teaching: *“The important thing is that I would like to do two jobs. To be a trainer, and to be a teacher (...)”* (Participant B).

The participants also have different views on the salary. Some of them place the salary in the context of holidays and the number of hours taught: *“You*

don't have to work 40 hours a week. The job isn't poorly paid, considering what you do" (Participant E). Other participants have a positive view of the frequent increases in teachers' salaries: *"They keep increasing their salaries, which is great"* (Participant I). However, somewhat negative views on teachers' salaries prevail, with the salaries seeming low to most of the participants: *"I would say they could increase the salary, for how much stress they have with pupils"* (Participant O).

The questionnaire survey focused on the importance of the aforementioned motivators. In the questionnaire, the respondents could choose from the option *It motivates me a lot* (score 4) to *It does not motivate me at all* (score 0). The results show that the amount of free time is an important motivating factor. Moderate motivators are job security, job stability and flexibility, and the opportunity to work with children. The prestige of the profession and the salary are perceived ambivalently. For details see Table 1.

Table 1

Scores of selected motivators for becoming a teacher

Motivator	Free time	Flexibility	Job security	Job stability	Work with children	Prestige	Salary
Score	3.1	2.6	2.8	2.8	2.5	1.8	2.1

Negatives of being a teacher: Among the participants of the qualitative research, the most frequently mentioned negative factor is the pupils. The greatest concern relates to the behaviour of pupils: *"Children are getting more and more spoiled; they have no respect for the teachers"* (Participant I). Some participants expressed concern about whether they would be able to behave professionally when pupils misbehaved: *"I'm afraid that if I were a teacher, they would treat me like that (...), I don't know if I would be able to deal with it professionally"* (Participant I). Another participant mentions concerns about pupils' behaviour in the context of a lack of power to manage it: *"Teachers have terribly few rights to say or do anything so that they don't suffer any consequences"* (Participant M). Another negative factor is concerns related to parents. Participants are of the opinion that many parents do not cooperate with the teacher, and instead stand in opposition to him/her: *"If the child doesn't learn, it's the child's fault, not the teacher's. It's just that the parents go to the teacher, shout him down, and the teacher can't do anything"* (Participant D).

The above factors are related to concerns about the quality of school management. One participant states: *"(I'm a little worried) about having good management because I think that's one of the most important things. If you have*

bad management, it can make you quite uncomfortable” (Participant E).

Some participants mention problems in the education system, particularly the excessive amount of paperwork that teachers have to deal with: *“Because of the thousands of papers, teachers don’t want to go on excursions”* (Participant H).

The questionnaire survey examined concerns related to the teaching profession. This open-ended question was answered by 69 respondents. Each respondent could indicate multiple areas of concern. The most frequently mentioned issues involved parents and communication with them (15 responses), pupils (13 responses), class leadership (7 responses) and public speaking (6 responses), which is consistent with the qualitative research.

The desire to work with children and young people

The qualitative research indicates a desire among the participants to work with children and youth. Sometimes it is an ambition to develop knowledge and skills in the pupils: *“I’d rather be around people, around children, and give them some knowledge, so that they don’t turn out to be dummies”* (Participant L). The motivation of some participants is not only to educate pupils but also to foster their development and encourage moral values in them: *“I can be some kind of role model for these kids, so that they don’t become bad guys”* (Participant O).

The desire to become a teacher is often related to previous experience of tutoring and working with children. A number of the participants have such experience. The range of their activities varies considerably; while some have previously helped peers with homework, others have regularly tutored family members, helped classmates to understand more difficult content, or have experience of leading summer camps. Some participants explicitly state that they have enjoyed such activities: *“I tutored a girl who really worked hard, and I enjoyed it with her”* (Participant I).

In the questionnaire survey, 46% of the respondents state that the reason they chose teacher education is that they want to become teachers, while 59% state that they already have experience of working with children.

The choice of computer science as a specialisation

In the Czech education system, when enrolling in teacher education for lower secondary schools, applicants choose two teaching specialisations that they will study and then teach in the future. Given the applicants’ preferences, it is common that one teaching specialisation is the “obvious choice”, known as the primary specialisation, while the other specialisation is called the secondary

specialisation. In our research, we were interested in whether computer science is perceived as a primary or secondary specialisation. The questionnaire survey found that one third of the respondents (35%) see computer science as their primary specialisation, one third (33%) as a secondary specialisation, and one third (32%) cannot decide.

Choosing computer science for strategic reasons

For many of the participants in the qualitative research, the choice of computer science as a secondary specialisation is influenced by strategic reasons. Some participants are motivated by the idea of getting a job more easily due to the shortage of computer science teachers: *"I know that schools in my area don't have enough of these teachers. Many computer science teachers are retired (...) There are some who don't even have a degree"* (Participant P). The same participant sees computer science as a complement to his primary specialisation: *"I was thinking of computer science (as a complement) to maths. What is most suited to it (...)"* (Participant P). In the questionnaire survey, 24% of the respondents who consider computer science as a secondary specialisation indicate that they chose computer science for strategic reasons.

Some participants select computer science because they believe it will be an easy degree, often choosing this specialisation as an easy way to become students of their favoured primary specialisation. Participant O chose computer science as a secondary specialisation because: *"It is one of the easiest ways, we come across computer science all the time, everyone is always using the computer and maybe playing some games"*.

The study of computer science at high school

The questionnaire survey shows that 23% of the respondents attended high schools specialising in computer science (CS high schools). These respondents are more likely than others to consider computer science as their primary specialisation (56% of leavers of CS high schools versus 28% of leavers of other schools). However, these respondents are more likely than others to consider not entering the teaching profession after graduation (63% of leavers of CS high schools versus 42% of leavers of other schools).

The qualitative part of the research shows that leavers of CS high schools have a good knowledge of computer science; for example, in the area of programming. On the other hand, leavers of the other schools report that their computer science lessons at high school dealt mostly with the basics of office software: *"At lower-secondary school, we basically did the same things as we did at high school. Word, PowerPoint, Excel, and that kind of classic stuff"*

(Participant Q). Thus, their knowledge of computer science varies considerably, which in turn affects their expectations of studying teacher education in computer science.

The relationship to computer science

A positive attitude towards computer science seems to be an important factor in the choice of specialisation. This is evident among participants of the qualitative research who chose computer science as their primary specialisation: *“We had optional classes of programming, so I was more attracted to it afterwards”* (Participant F). However, some participants may have a distorted view of what computer science involves: *“Mainly I was always around computers and games”* (Participant M).

Some participants first chose the specialisation they wanted to pursue, and only later decided to study teacher education. This can be seen among participants who previously studied at a technical university specialising in computer science. However, as they were not successful in their studies, they returned to the process of choosing a field of study. For these participants, there is a reconciliation with not having mastered the more difficult studies of the applied field and being satisfied with the easier alternative in the form of teacher education in the same field: *“My first university studies didn’t work out well. I studied computer science at the Czech Technical University in Prague, but it was too difficult for me”* (Participant A).

Former teachers as inspiration

Good teachers do not necessarily directly motivate their students to become teachers; however, they can contribute to fostering interest in the subject they teach. Later, when choosing a university and a field of study, students may focus on the field related to that subject. In the case of computer science, it is usually a degree in applied computer science, but it can also be teacher education in computer science: *“I said to myself: yeah, if I taught computer science this way, I would know that the lessons would be fun for everyone and that it would encourage others to go on to do computer science”* (Participant F). On the other hand, some teachers may discourage students from the subject they teach: *“As for physics, I was frustrated with one teacher: she was strict and I didn’t learn anything”* (Participant N).

Expectations of teacher education in computer science

When choosing a specialisation, potential pre-service teachers are influenced by their expectations of teacher education in computer science. Nearly

one half of the qualitative research participants expect to gain a deeper insight into programming: *"I wanted to learn a lot of programming languages (...) I like learning Python, that's great, but I would also like to learn something more difficult"* (Participant G). Other participants expect to gain skills for teaching computer science. For these participants, teacher education is their first experience of university study, and all of them want to enter the teaching profession after graduation. One participant states: *"I enrolled with the idea of learning how to teach the kids"* (Participant D). The participants expect to learn either applied computer science (including programming) or the didactics of computer science; no one mentions both at the same time.

Several participants are influenced by their lower secondary school experiences. As they learned only easy and uninteresting content in lower secondary school, they assume that teacher education in computer science cannot include any challenging courses: *"There will only be some basics in computer science, because when I saw it in our school, they really didn't learn anything"* (Participant K). Other participants expect to take computer science courses such as graphics, web development or computer networking, while still others are not sure which courses they might take. Some participants were discouraged from choosing this specialisation due to the fear of having to have knowledge of other disciplines, typically mathematics: *"When I went to computer science, I was so scared of maths because it seems to belong to computer science"* (Participant I).

For several of the participants who consider this to be their secondary specialisation, the reason for choosing it was to replace their original secondary specialisation. They believe that computer science is a similar field to their previous specialisation. An example is a participant who chose mathematics as a secondary specialisation in his previous unsuccessful teacher education: *"So I took computer science because I had mathematics before that. In computer science, I thought that the maths might not be so difficult, and it might be about something else"* (Participant M). For these participants, computer science education may represent an 'escape' to an easier specialisation, as described in section 3.2.1.

Gender stereotypes

Although women outnumber men in most teacher education specialisations, men outnumber women in computer science. According to the female participants in the qualitative research, the reason may lie in the inclination of women towards non-technical fields (and, in the case of teacher education, towards non-technical specialisations): *"It is true that there are not many girls in the classroom. Most of them choose some humanistic subjects. But why shouldn't a girl go into computer science?"* (Participant I). According to another female

participant, this is due to the fact that women are not as technically oriented as men.

Three female participants were included in our qualitative research: one of them had been interested in computer science since childhood and thus it can be argued that she chose teacher education in computer science because of her interest in this field. Another originally intended to apply to a private film school, but due to the tuition fees she decided to become a teacher. It is possible that she considers computer science to be a similar field of study to her original choice. The third participant was recommended computer science as the easiest secondary specialisation.

The female participants perceive computer science and some other specialisations (and consequently teaching subjects) as being more the domain of men, while other specialisations are more the domain of women. One female participant states: *"I think computer science is a field for girls as well, but girls are not as tech-savvy. They are not as good at some of those subjects, so they prefer to teach music or art and subjects like that"* (Participant K).

As shown in the questionnaire survey, compared to male respondents, female respondents are less likely to choose computer science as their primary specialisation (26% of women versus 39% of men), show a less positive attitude towards computer science (on a five-point scale the difference in the scores was 0.35 points), and are more likely to choose computer science for strategic reasons (25% of women versus 9% of men who do not consider computer science to be their primary specialisation). Women are less likely than men to consider a job outside education (22% of women versus 59% of men).

Discussion

In line with other studies that have focused on computer science teachers (Everson & Ko, 2022; Průcha et al., 2019; Yeni et al., 2020), we identified similar demotivating factors inherent in teaching and working with children. Compared to these studies, our respondents also emphasise concerns about interacting with parents, but less frequently emphasise the insufficiency of salaries.

The pre-service teachers' opinions, expectations or ideas of the teaching profession identified in the present research may be naive or hypercritical. Although it would be possible to disprove them, we do not consider it useful to do so. The participants, and high school students in general, are influenced by these opinions and should be listened to. At the same time, pre-service teachers need to be prepared for the reality of school during their studies. In this way, their fears about whether they can cope with the role of a teacher can be

overcome. This may reverse their earlier decision not to enter the teaching profession. According to Yeni et al. (2020), 75% of pre-service computer science teachers consider not entering the teaching profession. Our research suggests that 46% of pre-service teachers consider this at the beginning of their studies.

In order to educate future computer science teachers so that they will work in education, preparation in applied computer science courses should focus on the development of the skills needed by teachers rather than on producing experts in applied computer science. An example of this is programming lessons: instead of creating complex software, attention must be paid to skills such as the ability to discuss the accuracy of a solution, the ability to explain the functionality of the created program to another person, etc. By learning in this way, pre-service teachers can naturally develop their teaching skills beyond pedagogical and didactic courses. This is in line with Juškevičienė et al. (2024, p. 1), who suggests prioritising “practical, classroom-oriented professional development and fostering a culture of collaboration in educational institution”.

There is also a need to reduce over-optimistic expectations of students and prepare them for the reality of school. In this way, it is possible to avoid the reality shock that often leads to dropping out of the teaching profession. Different studies report varying dropout rates, ranging from 1% to 50% (Hanušová et al., 2017). In the Czech Republic, the drop-out rate for computer science teachers is 7% (for comparison, it is 5% for mathematics teachers) (Píšová & Hanušová, 2016).

If we want to avoid teachers dropping out of the teaching profession, it is necessary to provide pre-service teachers with sufficient connections to schools. In particular, quality teaching practice during their studies seems to be important in order to reduce their anxiety about managing interaction with pupils. This teaching practice should run throughout teacher education and gradually increase in intensity (first observation, then teaching part of a lesson, later teaching a whole lesson, and finally regular teaching of several lessons during the school year). Novice teachers should also receive quality support, such as having a mentor and psychological support.

The results of the present study suggest that teacher education in computer science is subject to gender stereotypes, as the female participants perceive this specialisation as a male domain. This is consistent with findings that far fewer women than men study and then work in computer science (Zhang et al., 2021). If we want to change this trend, we need to make computer science more attractive to women. This can be achieved during education at school, especially at primary and lower secondary levels. It is necessary to choose appropriate teaching methods and select appropriate tasks that are attractive to women

(Hubwieser et al., 2016). This should also be followed in the education of pre-service teachers of computer science. Although female pre-service teachers of computer science show a less positive attitude towards computer science than men, they are less likely than men to consider a job outside education. There is therefore a need to provide assistance in their education.

Novice pre-service teachers differ in their expectations of teacher education in computer science: while some expect to learn specialised computer science topics, others expect a didactical focus. If we want to prevent dropouts due to considerable differences between expectations and real education, it is necessary to differentiate the lessons and offer a suitable range of optional courses. These should meet the needs of different groups of pre-service teachers and reflect the main objective of the study, i.e., to educate future computer science teachers. Approaches that support computer science skills while incorporating pedagogical aspects (e.g., the development of software to support learning and/or teaching) also seem to be appropriate.

Conclusion

The decision to become a computer science teacher is made at the end of high school and typically has two phases: deciding whether to study teacher education, and deciding whether to pursue computer science. In most cases, students first consider teacher education. This choice is influenced by the expected positive and negative aspects of the teaching profession as well as the desire to work with children and young people. Subsequently, they decide whether to choose computer science as a specialisation. Their relationship to computer science and their expectations of teacher education in computer science play an important role in this decision. Both are influenced by their knowledge of computer science, which is formed during their high school education. Other factors are their former teachers, strategic reasons and gender stereotypes.

Female pre-service teachers of computer science show a less positive attitude towards computer science than men. On the other hand, they plan to become teachers after graduation more often than men. Supporting them in their studies is therefore meaningful not only in terms of increasing the number of computer science teachers, but also in terms of breaking the stereotype that computer science is only for men.

The present research found that pre-service computer science teachers are motivated to become teachers by external factors (length of leave, job security and stability, and partly job flexibility and salary). Although these motivators may be important, it is also necessary to strengthen internal motivation for becoming

a teacher, especially in psychology-oriented courses. Pre-service teachers are demotivated by concerns about pupils (especially their behaviour) and parents. As a result, many pre-service teachers decide not to enter the teaching profession after graduation. To avoid this, it is necessary to provide pre-service teachers with sufficient connections to schools and to offer them quality support.

One limitation of the present research is the small sample size. For this reason, we had to refrain from statistical testing of quantitative data, and such results are difficult to generalise. The research was conducted with Czech pre-service teachers; caution is needed when applying the results to other countries, as teachers in these countries may have a different social status and teacher education may also differ. The research participants were students who had already decided to study teacher education in computer science. It is not clear how students who considered these studies but who finally decided not to choose them would have responded.

The topic of students who are considering teacher education in computer science could be the focus of further research. This would help us to understand how to motivate them to study teacher education. There is also a need to investigate the factors that lead novice teachers of computer science to leave the profession. It is possible that, in addition to the general reasons, there is an imbalance in their workload. At least in the Czech Republic, schools are supposed to employ a network administrator and a methodology specialist in information technologies; however, these positions are often held by computer science teachers and it is questionable whether the scope really suits them.

The contribution of the research lies in the description of the decision-making process regarding whether to become a computer science teacher and the identification of the factors that influence this process. The findings will enable educational institutions (e.g., faculties of education) to adjust their marketing and educational strategies to produce more, and better, computer science teachers who will stay in education and be satisfied in their jobs.

Ethical statement

Data collection and data processing were performed in compliance with the relevant laws and institutional guidelines. Before the research began, the participants were informed of the purpose and the course of the research, and of the voluntary nature of their participation. The participants' informed consent was then obtained.

The privacy rights of the participants were observed. The interviews were recorded, but all of the data were anonymised before analysis to prevent

the participants being identified. The same was done with the completed questionnaires.

The research study was approved by the Ethical Committee of the Faculty of Education, University of South Bohemia, Czech Republic.

Disclosure statement

The authors have no conflict of interest to declare.

References

- Bergmark, U., Lundström, S., Manderstedt, L., & Palo, A. (2018). Why become a teacher? Student teachers' perceptions of the teaching profession and motives for career choice. *European Journal of Teacher Education*, 41(3), 266–281. <https://doi.org/10.1080/02619768.2018.1448784>
- Birks, M., & Mills, J. (2011). *Grounded theory: A practical guide*. Sage Publications.
- Bruinsma, M., & Jansen, E. P. W. A. (2010). Is the motivation to become a teacher related to pre-service teachers' intentions to remain in the profession? *European Journal of Teacher Education*, 33(2), 185–200. <https://doi.org/10.1080/02619760903512927>
- Bukor, E. (2011). *Exploring teacher identity: Teachers' transformative experiences of re-constructing and re-connecting personal and professional selves* [Doctoral dissertation, Ontario Institute for Studies in Education, University of Toronto]. TSpace. <https://utoronto.scholaris.ca/server/api/core/bitstreams/3df42f15-0e94-4fc5-a13e-b3bboad3bed4/content>
- Bukor, E. (2015). Exploring teacher identity from a holistic perspective: Reconstructing and reconnecting personal and professional selves. *Teachers and Teaching*, 21(3), 305–327. <https://doi.org/10.1080/13540602.2014.953818>
- Butler, A. S. (2021). The impact of external contextual factors on teaching candidates. *Center for Educational Policy Studies Journal*, 11(3), 55–74. <https://doi.org/10.26529/cepsj.1072>
- Charmaz, K. (2014). *Constructing grounded theory* (2nd ed.). Sage Publications.
- Corbin, J., & Strauss, A. (2008). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (3rd ed.). Sage.
- Czech School Inspectorate. (2024). *Kvalita vzdělávání v České republice ve školním roce 2023/2024: Výroční zpráva České školní inspekce* [Quality of education in the Czech Republic in the 2023/2024 school year: Annual report of the Czech School Inspectorate]. <https://www.csicr.cz/cz/Dokumenty/Vyrocní-zpravy/Kvalita-vzdelavani-ve-skolnim-roce-2023-2024-%E2%80%93-vyr>
- Daud, A. (2021). Becoming an English teacher: An autobiographical narrative inquiry. *AL- ISHLAH: Jurnal Pendidikan*, 13(1), 90–98. <https://doi.org/10.35445/alishlah.v13i1.405>
- Everson, J., & Ko, A. J. (2022). “I would be afraid to be a bad CS teacher”: Factors influencing

- participation in pre-service secondary CS teacher education. In J. Vahrenhold, K. Fisler, M. Hauswirth, & D. Franklin (Eds.), *Proceedings of the 2022 ACM Conference on International Computing Education Research – Volume 1* (pp. 237–246). ACM.
<https://doi.org/10.1145/3501385.3543966>
- Fokkens-Bruinsma, M., & Canrinus, E. T. (2012a). Adaptive and maladaptive motives for becoming a teacher. *Journal of Education for Teaching*, 38(1), 3–19. <https://doi.org/10.1080/02607476.2012.643652>
- Fokkens-Bruinsma, M., & Canrinus, E. T. (2012b). The Factors Influencing Teaching (FIT)- Choice scale in a Dutch teacher education program. *Asia-Pacific Journal of Teacher Education*, 40(3), 249–269. <https://doi.org/10.1080/1359866X.2012.700043>
- Fokkens-Bruinsma, M., & Canrinus, E. T. (2014). Motivation for becoming a teacher and engagement with the profession: Evidence from different contexts. *International Journal of Educational Research*, 65, 65–74. <https://doi.org/10.1016/j.ijer.2013.09.012>
- Hanušová, S., Pišová, M., Kohoutek, T., Mínaříková, E., Janík, M., Janík, T., Mareš, J., Uličná, K., & Ježek, S. (2017). *Chťejí zůstat nebo odejít?: Začínající učitelé v českých základních školách* [Do they want to stay or leave? Novice teachers at Czech primary and lower secondary schools]. Masaryk University. <https://doi.org/10.5817/CZ.MUNLM210-8922-2017>
- Hennessy, J., & Lynch, R. (2016). “I chose to become a teacher because.” Exploring the factors influencing teaching choice amongst pre-service teachers in Ireland. *Asia-Pacific Journal of Teacher Education*, 45(2), 106–125. <https://doi.org/10.1080/1359866X.2016.1183188>
- Hubwieser, P., Hubwieser, E., & Grswald, D. (2016). How to attract the girls: Gender-specific performance and motivation in the Bebras Challenge. In A. Brodnik, & F. Tort (Eds.), *Informatics in schools: Improvement of informatics knowledge and perception. ISSEP 2016* (pp. 40–52). Springer. https://doi.org/10.1007/978-3-319-46747-4_4
- Juškevičienė, A., Jevsikova, T., Stupuriėnė, G., & Vinikienė, L. (2024). STEM teachers’ motivation and engagement in teacher professional development and career advancement: A case study of Lithuania. *Education Sciences*, 14(7), 780. <https://doi.org/10.3390/educsci14070780>
- Keck Frei, A., Berweger, S., & Bieri Buschor, C. (2017). Men considering (and choosing) teaching as a career: What accounts for their decision to become a teacher? *European Journal of Teacher Education*, 40(4), 535–549. <https://doi.org/10.1080/02619768.2017.1315397>
- Kılınç, A., Watt, H. M. G., & Richardson, P. W. (2012). Factors influencing teaching choice in Turkey. *Asia-Pacific Journal of Teacher Education*, 40(3), 199–226.
<https://doi.org/10.1080/1359866X.2012.700048>
- Knell, P. F., & Castro, A. J. (2014). Why people choose to teach in urban schools: The case for a push-pull factor analysis. *The Educational Forum*, 78(2), 150–163.
<https://doi.org/10.1080/00131725.2013.878775>
- Mills, J., Bonner, A., & Francis, K. (2006). The development of constructivist grounded theory. *International Journal of Qualitative Methods*, 5(1), 25–35. <https://doi.org/10.1177/160940690600500103>
- Ministry of Education, Youth and Sports of the Czech Republic. (2025). *Základní výstupy z mimořádného šetření: ke stavu zajištění výuky učitelů v MŠ, ZŠ, SŠ a VOŠ* [Key findings from the

extraordinary survey: On the status of teaching provision by teachers in kindergartens, primary schools, secondary schools, and higher colleges].

https://edu.gov.cz/wp-content/uploads/2025/07/Mimoradne-setreni_ucitele_2025.pdf

Moses, I., Berry, A., Saab, N., & Admiraal, W. (2017). Who wants to become a teacher? Typology of student-teachers' commitment to teaching. *Journal of Education for Teaching*, 43(4), 444–457.

<https://doi.org/10.1080/02607476.2017.1296562>

Nur Fitria, T. (2023). Factors influencing education department students in choosing a teacher's career. *Epigram*, 20(1), 43–56. <https://jurnal.pnj.ac.id/index.php/epigram/article/view/5570>

Pappa, S., & Moate, J. (2021). Teacher educators' professional identity in English-medium instruction at a Finnish university. *Center for Educational Policy Studies Journal*, 11(3), 9–33.

<https://doi.org/10.26529/cepsj.1053>

Pišová, M., & Hanušová, S. (2016). Začínající učitelé a drop-out [Novice teachers and drop-out].

Pedagogika, 66(4), 386–407. <https://doi.org/10.14712/23362189.2016.353>

Plunkett, M., & Dyson, M. (2011). Becoming a teacher and staying one: Examining the complex

ecologies associated with educating and retaining new teachers in rural Australia? *Australian Journal of Teacher Education*, 36(1), 32–47. <https://doi.org/10.14221/ajte.2011v36n1.3>

Průcha, T. (2023). *Příprava učitelů informatiky v mezinárodním kontextu: Srovnávací studie*

[Computer science teacher education in an international context: A comparative study] [Doctoral dissertation, University of West Bohemia in Pilsen]. [Theses.cz](https://theses.cz).

Průcha, T., Filipi, Z., & Rohlíková, L. (2019). Problémy v přípravě učitelů informatiky: Případová

studie [Problems in computer science teacher preparation: A case study]. In D. Horváthová, A.

Michalíková, J. Škrinárová, & P. Voštinář (Eds.), *Proceedings of conference DidInfo 2019* (pp. 115–118).

Matej Bel University in Banská Bystrica, Technical University of Liberec.

<https://www.fpv.umb.sk/app/cmsSiteBoxAttachment.php?ID=4558&cmsDataID=0>

Richardson, P. W., & Watt, H. M. G. (2005). 'I've decided to become a teacher': Influences on career change. *Teaching and Teacher Education*, 21(5), 475–489. <https://doi.org/10.1016/j.tate.2005.03.007>

Saqipi, B., & Vogrinc, J. (2021). The contexts and processes of shaping teacher identity. *Center for*

Educational Policy Studies Journal, 11(3), 5–7. <https://doi.org/10.26529/cepsj.1274>

See, B. H., Munthe, E., Ross, S. A., Hiitt, L., & El Soufi, N. (2022). Who becomes a teacher and why?

Review of Education, 10(3), Article e3377. <https://doi.org/10.1002/rev3.3377>

Strauss, A., & Corbin, J. M. (1990). *Basics of qualitative research: Grounded theory procedures and techniques*. Sage Publications.

Šimandl, V., & Dobiáš, V. (2021). Analýza dat při tvorbě zakotvené teorie pomocí software atlas.ti

[Using atlas.ti software for data analysis through the construction of grounded theory]. *Paidagogos*,

2021(1), 131–156. <https://paidagogos.net/issues/2021/1/article.php?id=8>

Švaříček, R., & Šedová, K. (2007). *Kvalitativní výzkum v pedagogických vědách* [Qualitative research in education sciences]. Portál.

Teng, F. (2017). Emotional development and construction of teacher identity: Narrative interactions

about the pre-service teachers' practicum experiences. *Australian Journal of Teacher Education*,

42(11), 117–134. <https://doi.org/10.14221/ajte.2017v42n11.8>

Tomšik, R. (2019). Choosing teaching as a profession: Validation of an SMVUP-4-S assessment tool.

Problems of Education in the 21st Century, 77(4), 545–559. <https://doi.org/10.33225/pec/19.77.545>

Torres-Cladera, G., Simó-Gil, N., Domingo-Peñafiel, L., & Amat-Castells, V. (2021). Building professional identity during pre-service teacher education. *Center for Educational Policy Studies Journal*, 11(3), 35–54. <https://doi.org/10.26529/cepsj.1070>

<https://doi.org/10.26529/cepsj.1070>

Wang, W., & Wang, Z. (2022). Why choose a career in teaching? Exploring motivational factors that influence the decision to teach. *British Journal of Guidance & Counselling*, 51(1), 46–57.

<https://doi.org/10.1080/03069885.2022.2040003>

Watt, H. M. G., & Richardson, P. W. (2008). Motivations, perceptions, and aspirations concerning teaching as a career for different types of beginning teachers. *Learning and Instruction*, 18(5),

408–428. <https://doi.org/10.1016/j.learninstruc.2008.06.002>

Watt, H. M. G., Richardson, P. W., Klusmann, U., Kunter, M., Beyer, B., Trautwein, U., & Baumert, J. (2012). Motivations for choosing teaching as a career: An international comparison using the FIT-Choice scale. *Teaching and Teacher Education*, 28(6), 791–805.

<https://doi.org/10.1016/j.tate.2012.03.003>

Yadav, A., Connolly, C., Berges, M., Chytas, C., Franklin, C., Hijón-Neira, R., Leftwich, A., Margulieux, L., Macann, V., & Warner, J. R. (2022). Models for computer science teacher preparation: Developing teacher knowledge. In B. A. Becker, K. Quille, M.-J. Laakso, E. Barendsen, & S. (Eds.),

Proceedings of the 27th ACM Conference on on Innovation and Technology in Computer Science Education Vol. 2 (pp. 568–569). ACM. <https://doi.org/10.1145/3502717.3532166>

Yeni, S., Aivaloglou, E., & Hermans, F. (2020). To be or not to be a teacher? Exploring CS students' perceptions of a teaching career. In N. Falkner, & O. Seppala (Eds.), *Koli Calling '20: Proceedings of the 20th Koli Calling International Conference on Computing Education Research* (pp. 1–11).

<https://doi.org/10.1145/3428029.3428036>

Yong, B. C. S. (1995). Teacher trainees' motives for entering into a teaching career in Brunei Darussalam. *Teaching and Teacher Education*, 11(3), 275–280.

[https://doi.org/10.1016/0742-051X\(94\)00023-Y](https://doi.org/10.1016/0742-051X(94)00023-Y)

Zhang, Y., Gros, T., & Mao, E. (2021). Gender disparity in students' choices of information technology majors. *Business Systems Research Journal*, 12(1), 80–95.

<https://doi.org/10.2478/bsrj-2021-0006>

Biographical note

VÁCLAV DOBIÁŠ, PhD, is an assistant professor in the Department of Computing in the Faculty of Education at the University of South Bohemia in České Budějovice, Czech Republic. He has been preparing pre-service computer science teachers for 10 years. His research activities focus on the area of Informatics education in lower secondary schools and didactics of programming.

VÁCLAV ŠIMANDL, PhD, is an assistant professor in the Department of Computing in the Faculty of Education at the University of South Bohemia in České Budějovice, Czech Republic. His research activities focus on the area of Informatics education in lower secondary schools and programming. He has been teaching pre-service computer science teachers for 14 years.

MARTIN KOUŘIMSKÝ is a computer science teacher at the Grammar school of Písek, Czech Republic.