

## SHORT PAPER

# Examining Trajectories of Teacher Motivation in Correlation with Students' Perceptions in Computer Science: Toward Sustainable Motivation to Teach

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Teacher motivation in higher education (HE) has proved to be susceptible to several external factors that are capable of consequently influencing the teaching and learning process. This study aims to examine the external factors impacting the trajectories of teacher motivation during their profession in computer science. In addition, the work investigates a new paradigm that depicts teacher motivation from both teachers' and students' perspectives. Surveys and interviews with students and teachers were used to collect qualitative and quantitative data. A Likert scale survey is used to identify students' perceptions towards teacher motivation. The number of randomly selected survey respondents was approximately 100 undergraduates in computer science. Next, semi-structured interviews were conducted among twelve teachers from different laboratories in computer science. The interview questions were tailored based on the answers of the students' survey. The findings are projected to provide suggestions that contribute to sustainable teacher motivation.

**KEYWORDS**

teacher motivation, students' perceptions, sustainable motivation to teach in HE, semi-structured interviews

## 1 INTRODUCTION – TEACHER MOTIVATION IN LITERATURE

### 1.1 Definition and categories

Teacher motivation is a vital element that contributes to enhancing classroom effectiveness [1]. Moreover, teacher motivation is a complex area [2], the significance of which stems from its connections with teachers' plans and behaviors, in addition to teachers' psychological health and well-being [3]. Watt and Richardson [4] perceive teacher motivation as an important part of a teacher's professional competence due to its significant impact on the quality of instruction and the learners'

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academic growth. According to William and Burden [5], motivation can be divided into two categories: initiating motivation for starting an action and sustaining motivation for pursuing the action. Motivation does not only involve the reasons for doing an action, but the sustainability and hard work exerted to keep doing the same work [6]. Dörnyei and Ushioda [6] categorize teacher motivation into two dimensions: motivation to teach and motivation to remain in the profession of teaching. According to Dörnyei and Ushioda [6], teacher motivation has the following elements: i. the intrinsic motivation, which is closely linked to the inherent interest in teaching; ii. social-contextual factors related to the influence of external conditions; iii. temporal factors, with emphasis on continuous commitment; and iv. the impact of demotivating elements. Lauermann and Berger [7] focus on teachers' sense of responsibility for educational outcomes, and the authors indicate that little evidence was found for the association between class-level engagement and student-reported instructional practices. Adhering to certain teaching practices can stem from teachers' motivational beliefs. Moreover, teacher training is argued to be a demand for the efficient implementation of these teaching practices [7].

## 1.2 Motivation to teach

The initial motive for choosing the teaching profession is a key factor in teacher motivation [8]. Richardson, Karabenick, and Watt [8] examine teacher motivation for selecting teaching as a profession. In addition, the significance of the teacher's initial motivation to become a teacher [9] is highlighted when addressing the emotional impact [10]. The authors argue that the failure to meet the initial teacher motivation can lead to negative feelings of disappointment, exhaustion, and finally burnout. For selecting teaching as a profession, Brookhart and Freeman [11] identified three main types of motivation: intrinsic, extrinsic, and altruistic.

Berger and D'ascoli [12] argue that the greater the educational level, the less altruism there can be as a primary motivation for becoming a teacher. The authors highlight that those fluctuations in teacher motivation during the course of teaching have received little attention in the literature. Strong connections exist between the two motivational theories; therefore, motivation is perceived as a tool to educate in a dynamic rather than a static manner [12]. The authors suggest employing a longitudinal method, whether qualitative, quantitative, or mixed. Such an approach goes beyond the stage of observations and allows for examining and evaluating the fluctuations, influences, or dynamic features of motivation to teach.

Watt, Richardson, and Smith [13] acknowledge the significance of investigating the changes in the factors influencing teachers' choice over the course of teacher education; the authors also uncover explanations for these changes in the preservice evaluation of teacher degree studies. According to the authors [13], motivation should be included as a selection criterion for entry into teacher education programs. Whereas, according to Watt and Richardson [4], sociocultural contexts are classified as being responsible for giving a clear picture of motivations for choosing a career, job satisfaction, and persistence. Furthermore, the study argues that motivations for teaching include the following factors: "intrinsic value, job security, time for family, job transferability, shape future of children/adolescents, enhance social equity, make social contribution, work with children/adolescents, self-perceptions of individuals' own teaching abilities, the extent to which teaching had been a 'fall-back' career choice, social influences, and prior positive teaching and learning experiences" [23, p. 413].

Watt and Richardson [9] introduce the FIT-Choice framework for the study of motivation to teach. In a review study of teacher motivation, they focus on FIT-Choice to track the motivation to teach and remain teaching [9]. Upon investigating different categories of motivation, Ryan et al. [14] examine through self-determined teaching (SDT) theory the factors that can influence intrinsic motivation, self-regulation, and well-being. The authors investigate the impact that competence, autonomy, and relatedness, as innate psychological needs, can have on self-motivation and mental health. In addition, the study argues that these factors are universal and applicable in different cultures and contexts. Malmberg [15] investigates the relationships between motivational trajectories and teaching relevant antecedents and outcomes. In a recent study, Berger and Girardet [16] examine the relationship between motivation to become a teacher and the sense of responsibility. Furthermore, the authors investigate the impact of the sense of responsibility on classroom management styles.

Upon relying on the FIT-Choice Scale, Nesje, Brandmo, and Berger [17] examine the connection between teachers' career motivations and recruitment difficulties in the Norwegian context. The authors highlight the significance of existing knowledge on what motivates people to become teachers due to the "negative and inaccurate perceptions of the existing knowledge" [11, p. 5]. In addition, the authors argue for the urgent need to compare such motivations in different cultural contexts via a valid measuring instrument. Hence, this paper suggests comparing teachers' initial motivation to teach and during their profession in varied academic contexts to be able to detect the exact influential factors on teacher motivation.

### 1.3 Teacher motivation vs. students' motivation

Empirical studies have identified a connection between student and teacher motivation. Noels, Clement, and Pelletier [18] argue that the teacher-student relationship has a significant influence on motivation. Moreover, Taylor and Ntoumanis [19] perceive the intersection between students' motivation and teachers' motivation to be the result of students' views of the teacher's behavior as a manifestation of their motivation. Moreover, teacher motivation is argued to be related to student motivation when teachers implement motivating strategies [20]. Kunter et al. [21] examine teacher enthusiasm as a manifestation of intrinsic motivation and its relationship to instructional behaviors such as: "classroom management, use of cognitively stimulating methods, provision of social support for students" [7, p. 469]. The authors argue that teachers' enthusiasm for the subject matter can be different from their enthusiasm for teaching the subject. The limitations of the study, as reported by Kunter et al. [21], uncover the fact that the findings relied only on student observations. Therefore, the finding does not identify whether student perceptions of teacher motivation concur with teacher motivation. Therefore, this proposed study aims to identify teacher motivation from both perspectives: teachers and students. Furthermore, this study is an attempt to corroborate any concurrence between teacher and student motivation. Lazarides and Schiefele [22] acknowledge self-efficacy and teacher interest as two focal elements of teacher motivation. The authors [22] examine the relationships between mathematics teacher self-efficacy and interest, on the one hand, and several important aspects of teaching quality from the teachers' and students' perspectives, on the other.

Daumiller et al. [23] examine the impact of higher education teachers' achievement objectives and self-efficacy on students' learning experiences. Daumiller et al. investigate how students' views of teaching quality, including overall rating, learning, and their emotional experiences of joy and boredom, are linked to teachers' accomplishment goals and self-efficacy beliefs. At the instructor's level, the effects of self-efficacy were reproduced based on the fact that performance-approach and performance-avoidance goals are significantly important in certain sessions.

Lauermann and Berger [7] examined the relationship between teacher's self-efficacy and responsibility, teacher- and student-reported need-supportive practices, and finally student's engagement. According to the authors [7], adhering to certain teaching practices can stem from teachers' motivational beliefs. Self-efficacy is examined in Thommen et al. [24], together with enthusiasm and goal orientation. The authors [24] investigated teacher motivation and its impact on teaching quality by applying an integrated theoretical approach. They also examined different teacher motivational profiles [24], and the study results unfold that the connection between teacher motivation and teaching quality is not as clear as expected. The three profiles show that rather than excitement or self-efficacy, teachers differ mostly in their goal orientation. On examining the impact of autonomous teacher motivation on students' autonomy during their learning, Roth et al. [25] investigate different in-class teachers' behaviors and their influence on students' autonomous motivation.

This work aims to analyze the data received from both teachers and students on teacher motivation to identify any potential concurrence between students' perceptions of teacher motivation and student motivation to learn. The robust impact of teacher motivation on students' motivation is utilized in this study to identify how students perceive teacher motivation through their classroom behaviors as a result of the influencing factors on teacher motivation during their teaching profession.

*The significance of this study lies in its contribution towards uncovering teacher motivation trajectories from the start (teacher motivation to teach) to the current time (teacher motivation during the profession) and how to address teacher demotivating factors by teachers and decision makers and management in higher education. Addressing these factors aims to sustain teacher motivation and students' motivation and their learning.*

## 2 RESEARCH QUESTIONS AND OBJECTIVES

- I. identify the various factors that can influence teacher motivation, both outside and inside educational HE settings, beginning with their motivation to pursue a career in teaching and continuing through their motivation while teaching.
- II. contrast and compare the factors that contribute to teacher motivation fluctuation throughout the teaching career journey, as well as propose solutions to sustain teacher motivation in higher education, on the one hand, and student motivation to learn as a dependent variable, on the other. Hence, the study aims to answer the following three **research questions**:
  1. What are the external factors that can influence teacher motivation in computer science and how do they impact teacher motivation?
  2. How do students perceive teacher motivation and how does the latter impact their motivation toward learning?
  3. Which of the represented factors in the trajectories of teacher motivation can significantly contribute to sustainable motivation to teach?

### 3 METHODS AND STUDY DESIGN

A Likert scale questionnaire was used as a quantitative method to detect the perceptions of approximately 100 students on teacher motivation. The survey aims to identify the characteristics of teachers' motivation from students' perspectives and examine its correlation with teacher's motivation as reported during the interviews with teachers. A Likert scale includes items that range from "strongly disagree" to "strongly agree". The students' data will be followed by semi-structured interviews, the aim of which is to identify any commonalities in the concept of teachers' motivation from both participants: teachers and students. Therefore, this approach can provide more clarification and input to ambiguous and/or contradictory answers obtained during the data collection. The Likert scale is used in the students' survey to examine the correlation between the data collected from teachers and the students' observation of the teacher's motivation and theirs.

Semi-structured individual interviews were conducted as qualitative data that involved interviewing teachers. The sample size was randomly selected, and it covered 12 participants from various laboratories who were both lecturers and teaching assistants in a computer-science setting. Currently, the work aims at analyzing the collected data using thematic analysis to detect the external factors affecting teacher motivation. The interview questions are designed based on the answers collected from the students' survey.

#### 3.1 Likert Scale Survey for students

The Likert Scale Survey for students consists of the questions listed as follows:

1. I have been a motivated student during this year of my study of computer science.
2. How do you describe at least one of your motivated teachers? Please avoid any physical description and kindly provide adjectives or behaviors of the teacher.
3. How do you describe at least one of your demotivated teachers? (Please avoid any physical description and provide adjectives or behaviors of the teacher.)
4. My teachers' motivation has influenced my motivation, whether positively or negatively.
5. My learning has been influenced by my teachers' motivation.
6. A motivated teacher can positively influence my learning.
7. A demotivated teacher can negatively influence my learning.
8. A motivated teacher can influence my attendance rate (I attend their classes always or very often).
9. A demotivated teacher can influence my attendance rate (I tend to mostly skip their classes).
10. What factors can positively influence your motivation during your learning as a student of computer science? (Please select the main three factors.) a. Myself b. Teacher c. Study content d. The surrounding positive environment e. Grades f. Attendance g. Other factors
11. If your teachers' motivation can influence your motivation, can you briefly explain how? (You can give an example of your learning experience.)
12. How has your motivated teacher made you feel? (You can select more than one answer.) a. Motivated, b. Neutral/no influence, c. Relaxed and ready to learn, d. Willing to attend their classes, e. Willing to participate and ask/answer questions, f. Positive feelings, g. Negative feelings.

13. How has your demotivated teacher made you feel? (You can select more than one answer.) a. Demotivated, b. Neutral/no influence, c. More motivated, d. Unrelaxed and unwilling to learn, e. Unwilling to attend their classes, f. Unwilling to participate and ask/answer questions, g. Positive feelings, h. Negative feelings.
14. Please give an example (if it exists) of how your teacher's motivation has affected your emotional well-being, learning, attendance, grades, or any other aspect, whether positively or negatively.
15. A motivated teacher can positively influence my grade.
16. A demotivated teacher can negatively influence my grade.
17. Anything else you would like to add to highlight the role of your teacher's motivation in your emotions and/or learning and/or any other aspect?

### 3.2 Semi-structured interview for teachers

The semi-structured interview with teachers consist of the questions listed below.

1. How long have you been teaching for?
2. What made you choose to become a teacher? What motivates you to follow this career and life path?
3. What usually motivates you to carry on trying to do your best for your students?
4. What are some of the challenges that can affect or have affected your motivation as a teacher or a teacher in computer science?
5. What external factors (the wider society, a student's motivation, or any other) can affect your motivation?
6. When do you lose your motivation? Does your motivation have the same trajectory? What can change your motivation?
7. Does your students' motivation influence yours? Any correlations you have observed?
8. Do you think teacher motivation declines with time/age? how?
9. Has your career been characterized by different motivational levels? How does that flow?
10. How much do the conditions of employment (workload, salary, relations with management, colleagues, etc.) influence teacher motivation? How do you address this impact on your motivation if it exists?
11. Is motivation linked to issues of professionalism?
12. What can motivate you or demotivate you at this stage of your profession?

## 4 POTENTIAL OUTCOMES AND EXPECTED LIMITATIONS

The findings of this study are aimed at contributing to sustainable teacher motivation that can, in turn, have its impact on student motivation and, consequently, their learning. The study participants (12 teachers and 100 students) from one context in higher education in computer science can depict the reality of the motivational factors influencing teachers during their teaching profession, in addition to unfolding the hypothesized correlation of such motivation with students' perspectives towards a teacher's motivation. However, due to the uniqueness of each educational setting, the trajectories representing the teacher's motivation in the target study setting can be relatively and presumably dissimilar to those in other settings. Therefore, future studies should target more heterogeneous contexts to investigate

several trajectories of teacher motivation and consequently synthesize how to address the major factors impacting this motivation, on the one hand, and the learning process, on the other hand, to attain the teacher's motivational level hoped for.

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