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# Back to Basics With Teacher Recruitment: What Do STEM Undergraduates Want?

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## ABSTRACT

The recruitment of undergraduate students in England into teacher education is a recognised challenge with recruitment targets having been missed in nine of the last 10 years. The recruitment shortfalls are most acute within STEM (Science, Technology, Engineering, and Mathematics) subjects. This qualitative study explores which aspects of teaching attract and deter undergraduate STEM students from entering the profession, and which aspects of the vocation are unknown to undergraduates. Participants consisted of 267 STEM undergraduate students (73% White British; 57% female) from a broad range of UK universities. The sample reflected the sociodemographic characteristics (e.g., ethnicity, gender, socioeconomic background [SEB]) of undergraduate students in British universities. Data for this study consisted of responses to open-ended questions about interest in teaching generated after exposure to an experimental vignette intervention consisting of 12 teaching-related vignettes, each exhibiting a different motivation for entering teaching. Data were coded using reflexive thematic analysis and multiple indexing. Findings from this study suggested that participants were primarily attracted to teaching by the perceived emotional rewards of supporting young people, and the tangible benefits (e.g., holidays) made the career desirable. However, participants also felt an imbalance between the pull and push factors of teaching. Workload and negative treatment of teachers were seen as the central deterrents to entering teaching; however, we also found that there was a significant knowledge deficit about what teaching entails.

## 1 | Introduction

Recruiting the best possible candidates for teacher education is a global challenge, with estimates suggesting that tens of millions of new teachers are required internationally over the next decade (UNESCO 2022). The situation is made worse in some contexts by rising rates of early career teacher attrition (Gorard et al. 2021). Recruitment shortfalls are most acute within STEM (Science, Technology, Engineering, and Mathematics) subjects (McLean, Worth, and Faulkner-Ellis 2023; See et al. 2020). To understand the teacher recruitment challenge, we need to better understand the career decision-making motivations of potential teachers. Although considerable research has explored preservice and inservice teacher motivation (e.g., Bardach and

Klassen 2021), less is known about what motivates undergraduate students to choose teaching as a career, and which aspects of teaching specifically motivate and demotivate individuals during their decision-making process. The purpose of this qualitative study is to better understand which aspects of teaching as a vocation attract, deter and are unknown to STEM undergraduate students.

### 1.1 | Teacher Recruitment and Shortages in the UK

Teacher recruitment strategies tend to be built on two pillars: appeals to social utility, that is, attracting teaching candidates

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by emphasising the social contribution of teaching, and appeals to personal utility, that is, attracting candidates by emphasising the personal benefits associated with teaching (Richardson and Watt 2016). In the UK, recent examples of these two approaches include the DfE's social utility-targeted *Every lesson shapes a life* advertising campaign, which highlights the potential for social rewards associated with teaching (DfE 2019). Appeals to personal utility are seen in various financial incentives schemes including subject-dependent bursaries and scholarships worth up to £30,000. However, the impact of these financial incentives on Initial Teacher Education (ITE) applications is uncertain (Noyes, Geppert, and McIntyre 2019; See and Gorard 2019), with recruitment figures continuing to miss ITE targets in 2023/24 (DfE 2023a, 2023b, 2023c) despite the incentives offered to potential students.

Shortfalls in recruitment are exacerbated by teacher attrition. Teacher attrition—especially of early career teachers—is a recognised problem in the UK and internationally (Lynch et al. 2016; Ingersoll 2002; Den Brok, Wubbels, and van Tartwijk 2017). In England, 9% of the teaching workforce in state schools left the profession in 2021–2022, and in 2022 there were 2300 unfilled teacher vacancies, up from 1600 in 2021 (School Workforce in England, Reporting Year 2022, 2023). Against the backdrop of high rates of teacher attrition, research on retention has progressed from exploring the physical retention of teachers in the classroom, to exploring how to sustain motivation and commitment to enable teachers to thrive professionally (Gu and Day 2007). Postpandemic teacher vacancy rates have skyrocketed, with teacher vacancies in February 2023 93% higher than in the year before the pandemic, and 37% higher than 2021–2022 (McLean, Worth, and Faulkner-Ellis 2023).

Statistics about undergraduate students' interest in teaching show cause for optimism, with up to 40% of UK undergraduates showing an interest in a teaching career (Thompson-Lee et al. 2023; Gorard, See, and Morris 2022). Similarly, research in Australia found one-third of STEM undergraduates were interested in teaching although recruitment numbers for Australian STEM teachers remain lower than the number of teachers required (Rice et al. 2023). There is a market of potentially interested teacher candidates, but the current campaigns are not effectively capturing or persuading many undergraduates (or career changers) as shown by the recurring shortages (Woolcock 2023). Complicating the issue, there is a tension between the recruitment picture painted by policy makers (e.g., in the *Every lesson shapes a life* campaign) and the realities of working conditions voiced by those on the frontline of teaching as was seen in the teacher strikes across all four British nations in 2023. The 2023 teacher job action increased public awareness of the job demands of workload, disciplinary issues and time pressures that characterise the profession (Granziera, Collie, and Martin 2020). Some of these workload factors have been acknowledged in government strategies designed to increase attraction to the profession, reflecting improvements in professional development opportunities and flexible working arrangements (DfE 2019).

## 1.2 | Interest in Teaching

Recent studies have investigated potential teachers' interest in teaching. A person's positivity in their impact (their hope) and

their desire for personal responsibility creates a level of interest in teaching (Eren 2015). Reeves and Lowenhaupt (2016) found that the motivations of making a social contribution and valuing the work of teaching were associated with preservice teachers' interest in teaching. Furthermore, some preservice teachers were motivated by the opportunity for 'advancement and influence beyond the classroom' (Reeves and Lowenhaupt 2016, 2) exhibiting as progress in their own careers, but also instigating positive change in curriculum and instruction (Robinson, Lloyd, and Rowe 2008). Torgerson et al. (2008) found that, in western democracies, those already with an interest in teaching were motivated by a desire to work with children, but those with less interest were motivated by salaries and professional advancements. Despite our growing knowledge about teacher motivation, little is known about the types of teaching-related motivation which most enhance STEM undergraduate students' interest in teaching in the UK.

## 1.3 | Motivations for Teaching

Decisions to enter teacher education are influenced by a range of external factors (social, economic, family) and internal factors (personality, values, motivation). The motivations for considering teaching as a career have received considerable research attention, with work by Watt et al. (2007, 2012) exploring teacher motivation using the Factors Influencing Teaching (FIT)-Choice scale. Likely the most frequently used model of teacher motivation (as found by See et al. 2022), the FIT-Choice scale uses self-reports from individuals to explore perceived abilities in relation to choosing teaching as a career. Rooted in social cognitive theory (Lent, Lopez, and Bieschke 1993), the model introduces three central classes of motivation: intrinsic value, social utility value and personal utility value; alongside task and self-perceptions related to the vocation of teaching. Furthermore, recent research has clarified an understanding of which aspects of teaching serve as motivators and demotivators. For example, social utility—enhancing social equity, creating 'brighter futures' (Giersch 2016)—is generally an attractant; conversely, the perception of a skewed work–life balance is a deterrent (Perryman and Calvert 2020).

Perception of being the right 'fit' for teaching (i.e., recognition that personal characteristics match with the demands of the job) is not only an important predictor of future applications into teacher education (Uggerslev, Fassina, and Kraichy 2012), but also of ongoing interest in the career (Klassen, Granger, and Bardach, 2023), and retention in the profession (Vogel and Feldman 2009). As a result, it is necessary to explore perceptions of fit when looking at motivations to enter the profession. When exploring what motivated teachers to enter the profession, Reeves and Lowenhaupt (2016) found that 10% of entrants cited their own positive school experience as a motivation to become a teacher, and a further 5% cited a negative school experience that motivated them to enter teaching (i.e., as a motivator to improve the profession). When exploring the retention of teachers, research in the field of teacher motivation leads us to explore what supports and undermines the motivation to remain in teaching (Alexander, Wyatt-Smith, and Du Plessis 2020) and the personal attributes which may be best suited to fit the role (Watt et al. 2012).

## 1.4 | Current Study

In light of the challenging teacher recruitment landscape in the UK, the purpose of this study was to explore how an intervention consisting of motivation messages embedded in realistic classroom vignettes would influence STEM undergraduates' interest in teaching. In this qualitative study, we used an experimental vignette methodology to explore UK STEM undergraduates' motivations associated with teaching career decision-making. We posed the following research questions:

- RQ1: Which aspects of being a teacher appeal to STEM undergraduates?
- RQ2: Which aspects of being a teacher are deterrents to STEM undergraduates?
- RQ3: What are the unknown aspects of teaching for STEM undergraduates?

## 2 | Methods

### 2.1 | Participants

Our data were collected from 267 participants (56.8% female; 4.5% nonbinary or self-described; mean age 20.1 years; 73% white) who were involved in a larger quantitative study investigating motivation interventions for teaching (see Klassen, Granger, and Bardach 2023). Our sample was roughly representative of the UK university population: in 2020/21 75% of all undergraduates in UK universities were white and 57% of undergraduates were female (Higher Education Statistics Agency 2023). Participants were STEM undergraduates recruited from a range of STEM courses from 18 universities in the UK (84% from England, 14% from Wales, 0.2% from Northern Ireland, 2% from Scotland). Recruitment was via academic departments within universities, and through the UK Institute of Mathematics who disseminated the survey to relevant parties. We included students studying core STEM subjects (e.g., maths, physics, biology) and psychology, since psychology undergraduates are eligible to train to teach subjects such as physics or mathematics with a short subject knowledge enhancement (SKE) course (DfE 2023a, 2023b, 2023c). Each participant who completed the questionnaire received a shopping voucher (£5).

### 2.2 | Materials

We used an experimental vignette methodology (EVM) that presented participants with 12 brief vignettes depicting realistic classroom situations. The EVM approach is similar to the recruitment intervention 'realistic job previews', (e.g., Baur et al. 2014) and involves presenting participants with realistic scenarios designed to influence intentions, attitudes and behaviours (Aguinis and Bradley 2014). Participants completed a brief questionnaire before and immediately after reading the vignettes. The questionnaire collected quantitative and qualitative (open-ended) responses, with the open-ended responses forming the data for this study. The questionnaire was administered using the online survey platform Qualtrics via an anonymous link delivered to university STEM departments.

Each of the 12 vignettes was written from the perspective of a newly qualified STEM teacher in their first teaching position and was labelled with one of 12 motivation themes. A short introductory text about the character and school was presented to participants before seeing the vignettes to provide clarity and initiate interest: *You have just finished your year-long training to be a secondary school teacher and are beginning your new job as a teacher in a state-funded academy. Imagine that each of these situations happen to you—how does it change your view of teaching as a career choice?* Each of the 12 vignettes was accompanied by a classroom image complementing the content of the vignette (see Appendix A for an example vignette).

To ensure authenticity, the vignettes were cowritten by a team including researchers and an educational consultant, all of whom had previous experience teaching in schools. The content was further validated by eight teachers and four nonteachers who read the vignettes for authenticity and for alignment with the motivation labels assigned to each vignette. Following a pilot study that tested responses to varying lengths of vignettes, the final 12 vignettes were rewritten to conform with the length (80–120 words) suggested in Skilling and Stylianides' (2020) framework on vignette methodology.

The motivation labels assigned to the vignettes were influenced by three motivation-related theories: person-environment fit (De Cooman et al. 2009; Player et al. 2017), FIT choice (Watt et al. 2007) and achievement goal theory (Butler 2007). The motivation themes incorporated into the vignettes were as follows: personal utility (extrinsic) consisted of salary and pension benefits, job security, job transferability and time for holidays and family. Personal utility (intrinsic) consisted of subject mastery and vocational autonomy. The motivation theme social utility included the desire to shape the future of children and adolescents, enhance social equity and make a meaningful social contribution. The motivation theme person-vocation fit (PV fit) included perceptions of a match with the vocation's demand for conscientiousness, organisation and planning, resilience and adaptability, empathy and communication and emotion management (see Appendix B for motivation labels and representative content).

After reading the vignettes, participants were asked to respond to one of three open-ended questions, with the question automatically assigned by the survey software based on the degree of change in their interest in teaching from pretest to posttest.

- Q1: After reading the scenarios, why have you changed your mind about teaching?
- Q2: After reading the scenarios, why are you still unsure about teaching?
- Q3: After reading the scenarios, why are you still not interested in teaching?

## 3 | Analysis

The data explored in this study were responses to the open-ended questions presented in the post test. We used reflexive thematic analysis to identify and analyse patterns both in the

phrasing, and in the content (Braun and Clarke 2021). We sought to identify, interpret and analyse patterns of meaning by focusing on the content of the data and not the repetition or frequency of ideas (Braun and Clarke 2006) which allowed greater breadth of exploration. An initial qualitative analysis of responses showed a high degree of overlap in the three potential posttest responses; therefore, the data explored within this paper are a combination of all three responses. From the initial 267 participants, 238 participants offered viable responses.

Multiple indexing allowed us to highlight patterns of association (Ritchie and Spencer 1994). In practice, this meant that each response could be coded multiple times and allowed access to each ‘meaning unit’: the smallest unit that contains insights needed (Bengtsson 2016). We used the qualitative software MAXQDA (VERBI Software 2021) to mitigate some of the issues that can arise when hand coding using multiple indexing due to a lack of clarity in annotation (Richards 2015). A coding list (Table 1) was created to provide definitions and examples (Morse and Richards 2002). To avoid repetition, examples from the data have been omitted from the table and presented in the results.

### 3.1 | Coding Process

Data were coded both inductively and deductively and followed a reflexive thematic analysis structure (Braun and Clarke 2021). We began with a set of ‘starter codes’ based on previous research (Elliott 2018); however, we were open to new ideas found within the data. Initially, data were coded into 37 separate codes, later collapsed to 19 codes following code reduction strategies suggested by Creswell (2015). We carried out the code reduction process by looking for redundant and overlapping codes and gradually reducing the number of codes. To ensure that the study was trustworthy and replicable (Morse and Richards 2002), a second researcher performed a separate analysis on a cross section of over half of the data (Graneheim and Lundman 2004). As a research team, we read through the data and codes to check agreement on the code definitions. The creation of themes, ‘broad units of information that consist of several codes aggregated to form a common idea’ (Creswell 2013, 186) included further analysis of the data, the codes, and their definitions to find commonalities. The resultant six themes offered a pattern of shared meaning which were organised around a central concept (see Braun and Clarke 2014): Emotional Rewards, Emotional

**TABLE 1** | Codes in descending population.

Code	Definition
Negative treatment and remuneration	The tangible benefits (pay and holidays) are not great enough and there is a lack of respect for the career
Workload	A sense of unrelenting pressure from unmanageable workload
Positive about supporting students	A desire to support and aid students in both their academic pursuits and their long-term goals and confidence
Positive about pay and conditions	A positive perception of remuneration, holidays and work–life balance
Imbalance	Positives of teaching outweighed by negative aspects or by draws of another career
Negative about supporting students	Explores the diverse challenges from poor student behaviour without effective punishment, to concerns about supporting student mental health
General rewards	A sense of gratification or reward, and pride
Interpersonal relationships	A nervousness or even dislike of building relationships with students and/or other staff
Systemic issues	Aspects relating to fixed aspects of school life, including but not limited to: Ofsted, referrals for pupil concerns; hierarchical structures
Belief in fit	Participants felt that their interests and skills fit the vocation
Friend/family deterrent	A vicarious awareness of negative experiences as a teacher
Desire for connection	A desire to build connections with staff and students
Patience	Lacking in the level of patience perceived to be needed
Opportunities presented by career	Opportunities presented by teaching, including travel and personal development
Inflexible and repetitious nature	Views of the career as monotonous and lacking flexibility inside and out of the classroom
Love of subject	A love of their subject that they are keen to grow or nurture in others

Costs, Tangible Rewards, Tangible Costs, Imbalance and Fixed Challenges. The example quotations included in the results reflect the content and breadth of each code.

## 4 | Results

Figure 1 shows the connections between the six themes: Emotional Rewards, Emotional Costs, Tangible Rewards, Tangible Costs, Imbalance and Fixed Challenges; and the 16 codes. The themes are shown in bold boxes and their corresponding codes in circles connected with an arrow. In addition, we calculated the degree of commonality (multiple indexing) among the 16 codes. The dotted central lines indicate that at least 20% of the responses within one code is multiple indexed to another code. For example, the code Belief in Fit within Emotional Rewards is connected to both Imbalance and Opportunities presented by Career showing there is at least 20% of the data items replicated between those three codes. In the next section, we discuss the six themes in descending number of codes.

### 4.1 | Theme 1: Emotional Rewards

The theme Emotional Rewards exhibited the emotional gains participants anticipated finding in teaching. These rewards included assisting students in reaching their goals and gaining an intrinsic sense of achievement and success. This theme saw the greatest number of codes as presented in Figure 1.

#### 4.1.1 | Positive Perception of Supporting Students

This code explored the importance of social utility: a strong desire to make a social contribution or to give back to society in a meaningful way (Watt et al. 2007). The code reflects current advertisements aimed to attract teachers, such as the DfE's ongoing campaign *Every Lesson Shapes a Life*. This code reflects the popular view that teachers make a difference through encouraging and supporting student learning and well-being.

Participants referred to their own memories of particularly supportive teachers; 'there are teachers that have had massive

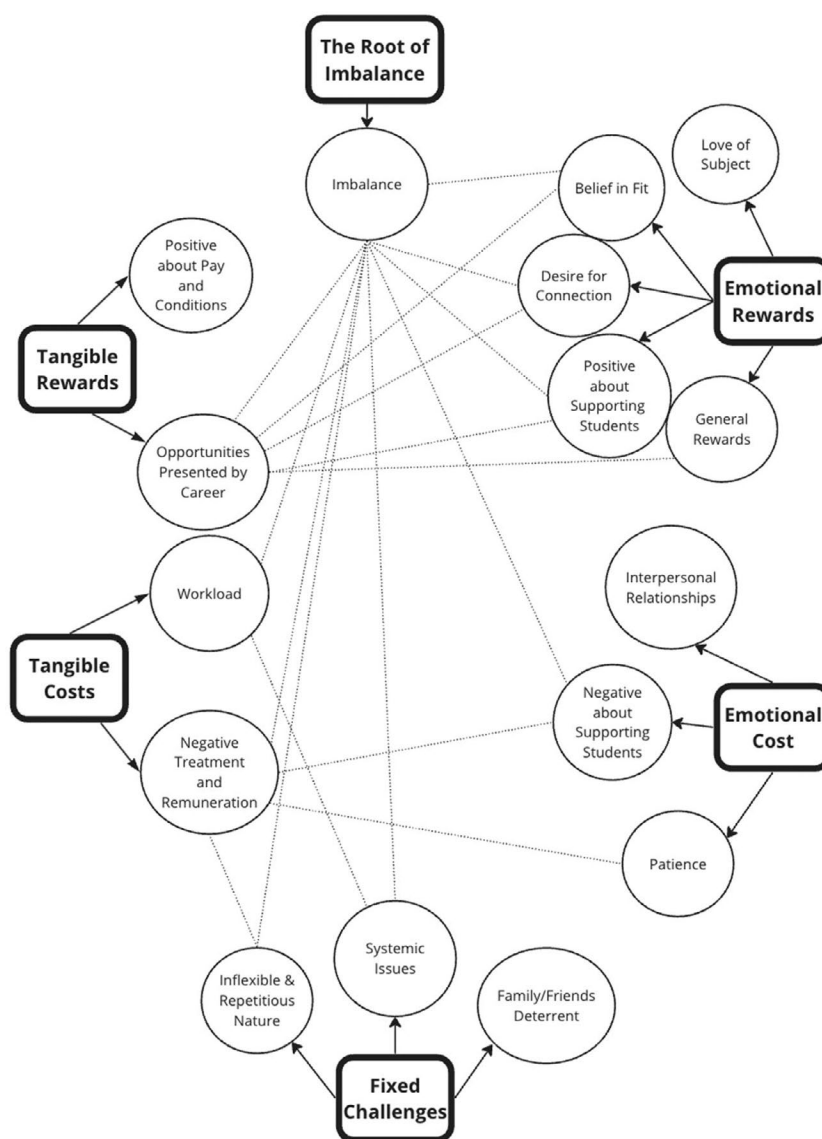


FIGURE 1 | Map of relationships between codes and themes.

positive impacts on my life' (M, 19). The potential to replicate a positive school experience for other students was seen as an attractant. There was a strong awareness of life beyond the curriculum and of the personal impact that teachers can have on students, 'in school and potentially in their future too' (M, 21). Several participants felt that the emotional support offered by teachers to students during their most 'vulnerable years' (F, 22) was a pressure, but they were motivated by being part of having a 'positive impact on students' wellbeing' (M, 19). However, some participants were acutely aware of the challenges they witnessed their own teachers facing, and although they wanted to support students, they were worried by the vulnerability of children and teenagers, and the impact that poor advice could have.

Helping students to access their future was widely seen with discussion of 'brightening their future' (F, 18); 'shaping their future' (F, 21); 'improving the future of young people' (M, 23); and the chance to 'shape their lives' (F, 32). This was the third most common code overall, and the most highly populated within this theme; the focus on improving the life outcomes for students was central to all responses.

#### 4.1.2 | Love of Subject

Participants expressed a strong personal connection to their subject area and a desire to cultivate this connection in others. One participant highlighted the importance of addressing societal disparities, citing the gender gap in STEM fields: 'I was reminded how important it was for young women to have role models in STEM and I would be really keen to share my passion for the sciences' (F, 30). Another participant aimed to enhance students' understanding and engagement in the subject: '[I] wanted to be a teacher to help communicate and improve students' knowledge in this sector' (M, 22).

However, participants also acknowledged challenges, including perceived limitations in the school curriculum and the potential difficulty of engaging apathetic students. Despite these concerns, participants expressed confidence in their ability to ignite passion: 'I really care about the subject and can help [students] learn that' (F, 19). Some participants recognised that pedagogical skills would develop during training. Paradoxically, they also expressed concerns about the prospect of teaching disinterested students, which they described as 'unfulfilling' (F, 21) or 'frustrating' (F, 19). Reflecting this divide, multiple indexing was seen with both Imbalance and Systemic Issues.

#### 4.1.3 | Belief in Fit

Fit, in this instance, refers to person-vocation (PV) fit: situated in the psychological theory of Person-Environment fit it has been found predictive of positive work-based attitudes, for example, commitment, job satisfaction and retention (Vogel and Feldman 2009). A perception of strong PV fit is a predictor of future applications to initial teacher education (Uggerslev, Fassina, and Kraichy 2012) and correlates with an interest in a teaching career (Klassen, Granger, and Bardach 2023).

Responses were divided between an explicit outline of why the participant perceived themselves to be a good fit, and a more generalised sense that they could see themselves knowing what to do in given situations. A minority of participants already saw teaching as their desired vocation and found that, 'I could imagine myself in those situations doing the right things' (M, 21) served to reinforce their belief in their fit as a teacher following their engagement with the vignettes. The majority of participants within this code saw teaching as a possible career because of their belief in fit following the vignettes, 'I've become even more interested in teaching now that I've seen how much more of a good fit I am' (Other, 22). However, some participants reflected on their perceived lack of fit for the role: 'it seems rewarding...but still not sure if will be good fit' (F, 20).

#### 4.1.4 | Desire for Connection

Participants expressed a desire to cultivate long-lasting and meaningful relationships with their students, aiming for a deeper connection beyond academic achievement. For example, one participant reflected on the importance of personal connections and caring for students on a personal level: '[The vignettes] made me think about personal connections.... caring personally for the students. Counselling, encouraging, helping, etc.' (M, 21). Participants believed that fostering a strong connection with students would enhance engagement in the classroom: 'there are ways to connect with them [students] and help them, and I think I could empathize with a lot of people' (M, 19). This empathy was seen as crucial for understanding and motivating students (Meyers et al. 2019). Similarly, another participant emphasised the importance of connections in teaching, stating that 'connections and nuances involved with teaching' (F, 34) were essential for both students' and teachers' enjoyment of the role.

Responses within this code also explored connection as a route to reaching 'brighter futures' (Giersch 2016). The potential activities that a teacher could instigate (clubs, for example) or take part in (events or trips) were perceived as enhancing social connection. As this 22-year-old shared, 'both the robotics club and care home scenarios touched my heart...those are the kind of initiatives I would love to implement' (M, 22). The vignettes describing creating a club for students based on a personal interest and setting up a pen pal scheme with an older people's home, allowed this participant to see appealing aspects of teaching. In the pretest, they responded *disagree* to, 'I am interested in becoming a teacher', however, in the posttest they agreed that there was a 'close match between my personal characteristics (e.g., personality) and those required for a teaching career' and they also responded *agree* to, 'I would consider training as a teacher.' In this instance, the participant showed an increased interest in teaching and recognised their personal attributes as being in line with those perceived as necessary in a teacher.

#### 4.1.5 | General Rewards

We received positive but general responses, for example, 'it seems like a very rewarding and positive job' (F, 19): the

participant perceived teaching positively, but did not elaborate on which aspects. Similarly, 'it looks like hard work, but it is rewarding' (F, 20). Some participants associated their positive feelings with having interacted with the vignettes: '[they] have shown examples of how rewarding teaching can be and how it can affect people for the better' (M, 20).

## 4.2 | Theme 2: Emotional Costs

The theme of Emotional Costs explored the intangible cost of teaching and related to both the participants' personal understanding of themselves and their understanding of the needs of students.

### 4.2.1 | Negative Perception of Supporting Students

Although less common than the positive perception of supporting students, this code saw supporting students as challenging, draining and thankless. Participants expressed concerns over 'no protection from students' (M, 20) both from allegations and physical violence. Similarly, some participants felt that students were prone to aggression, 'scream at you and are rude' (F, 20). Students were seen by some as 'disinterested' (M, 18) and 'abusive' (three participants). Furthermore, a minority felt similar to this participant: 'Teachers can be very important for child welfare and that sounds too stressful' (F, 19) the emotional and personal difficulties encountered by students could have emotional ramifications on teachers.

**4.2.1.1 | Interpersonal Relationships.** The sociability required for a career in teaching was seen as a deterrent for some participants including self-reported introverts. Some participants felt that they lacked the necessary compassion; would struggle to manage relationships with teachers; would not be able to build bonds with students; would find it challenging remaining calm in pressurised environments. Here we saw self-aware appraisals of the necessary patience: 'I'm sure I won't have patience with kids who won't try' (F, 56), 'I don't feel I have the patience' (M, 26), 'I lack patience, making it difficult to treat children and their issues' (M, 21). As these responses demonstrate, there was an amalgamation of a personal lack of patience, and a lack of patience in dealing with either challenging students, or students who require extra support.

## 4.3 | Theme 3: Fixed Challenges

The Fixed Challenges theme denoted various immutable, external aspects of teaching that were deemed deterrents to entering the profession. Some codes reflected the established conditions of teaching, and others explored systemic issues that impacted schools and teaching.

### 4.3.1 | Inflexible and Repetitious Nature

The repetitive structures seen in teaching were concerning to several participants. The perception that teachers cover the

same content annually was seen as a deterrent. As an example, one participant noted that 'Repeating the same curriculum every year sounds draining' (M, 18) and another, 'there is no tangible evidence for the quality of your work' (M, 22), with their desire for affirmation of their work perceived as being unfulfilled by teaching. Several participants 'want a career with more flexibility' (M, 20) which excluded teaching due to, 'never working from home' (F, 22 & F, 21) and not wanting to 'teach it the way it is taught' (M, 21). There was a perceived lack of autonomy as participants felt that all aspects of school life were tightly controlled.

### 4.3.2 | Systemic Issues

This code revealed deeply ingrained issues in education, such as school inspections and the perception of teaching as a constant struggle. Participants described unsupportive school structures, where teachers felt powerless in dealing with unruly pupils: 'It's just your word against his, we can't do anything' (F, 30). Additionally, some felt 'chastised' rather than supported by school leaders (M, 29). School inspections, like Ofsted, were viewed as 'scary' (NB, 21), 'stressful' (F, 21) and 'high pressure' (F, 19), deterring some from entering the profession.

Participants expressed frustration with systemic issues and 'red tape' challenges, feeling that autonomy and agency in teaching were limited (M, 30). Career progression often depended on school leadership and financial constraints. Disparities in resources were described, with some schools lacking basics as noted by one participant: 'local deprived and underfunded area...teachers have no spare time' (F, 20). This highlighted the varied challenges faced by teachers according to their school's circumstances.

### 4.3.3 | Family/Friends Deterrent

Some participants were deterred by their friends and family: 'I know from my mother's experience how draining teaching can be' (F, 21), and 'I never hear anything good about the career, even from friends I have who are teachers' (F, 32). For some, knowing teachers and observing their exhaustion due to a poor work-life balance (M, 21), high stress levels (M, 21) and excessive demands (F, 19) has been substantial enough to deter them from considering the vocation.

## 4.4 | Theme 4: Tangible Costs

This theme explored the Tangible Costs of teaching and is composed of two codes. This theme encompassed a little under a quarter of the data.

### 4.4.1 | Workload

This code encompassed two aspects of workload: teaching tasks such as marking and planning, and pastoral duties relating to pupil welfare and behaviour management. Some participants,

like F, 18, cited both aspects as deterrents to entering the profession, noting ‘Too much work, planning, and emotional toll’.

Marking and planning were perceived as labour-intensive and affecting work–life balance. Participants recounted observations of teachers struggling with workload, with one noting, ‘my mum is a teacher and she’s always planning and stressed out’ (M, 21). A further observed challenge was marking accuracy: ‘teaching also means marking and marking is a biased system that doesn’t actually reflect student’s abilities’ (F, 19). This participant’s view reflects the challenges seen in marking and grading in terminal exams in England: 96% definitive grade accuracy in mathematics, 55% in history (Black 2019). The challenge of fairness and efficacy when considering marking were perceived to amount to increased workload.

Concurrent demands were described as ‘intimidating’ (M, 20), leading to concerns about fulfilling responsibilities correctly. Participants characterised the workload as ‘unsustainable’ (F, 21), ‘demoralising’ (M, 20) and ‘stressful’ (eight participants). This negative perception of teaching workload underscores the emotional toll associated with the perceived quantity and importance of work. Furthermore, the pastoral aspect of the role was seen as time-consuming and complex, with one participant likening it to the duties of a counsellor (M, 26). The multifaceted nature of concurrent demands that extend beyond curriculum, were identified as concerns and deterrents for some participants.

#### 4.4.2 | Negative Treatment and Remuneration

This code explored widespread social perceptions of teaching, focused on the treatment of teachers and remuneration. Many participants expressed dissatisfaction with both pay and conditions, citing teachers as being: ‘not paid enough or appreciated enough’ (F, 19) and ‘teachers mostly aren’t respected and thanked enough’ (F, 21). Furthermore, the tension between managing challenging student behaviour and a perceived lack of support was highlighted as a deterrent. Participants recounted instances of verbal abuse and poor treatment from students, reflecting a reported increase in such behaviour postCovid (Weale 2023) leading to a feeling of being ‘undervalued, underpaid and overworked’ (M, 21) as in the case of one participant whose mother was a teacher.

Participants felt there was inadequate support in dealing with poor behaviour and acute student needs, exacerbated by ‘no respect for education from the government... incentives to get you into teaching quickly fade away’ (F, 21).

### 4.5 | Theme 5: Tangible Rewards

The theme encompassed aspects of teaching from which a person could gain a material benefit.

#### 4.5.1 | Positive About Pay and Conditions

As presented in one of the vignettes, participants acknowledged the attractive starting wage (£28,000) and the substantial employer pension contribution. Frequently, we saw appreciation for

the flexibility offered by longer holidays, facilitating a balanced lifestyle conducive to personal interests and family life: ‘It made me consider the flexibility that comes with teaching in terms of having school holidays and weekends to pursue my own interests as well as the money to do it’ (F, 20). The stability and security of the teaching profession were emphasised, particularly in the context of post-Covid economic uncertainty (National Institute of Economic and Social Research 2023, 6): ‘It is a stable career with regular breaks’ (F, 22), and ‘It seems like a secure job with lots of good opportunities’ (M, 22). Despite generally positive perceptions, some participants expressed confusion due to discrepancies between perceived and actual salary levels, influenced by prior narratives of low teacher pay: ‘I didn’t know the paycheck was that big...teachers always complain about how little they get paid...’ (F). Additionally, over one-fifth of responses indicated a perception of imbalance, suggesting that while salary and benefits were valued, they were not sufficient on their own to fully attract participants to the profession.

#### 4.5.2 | Opportunities Presented by the Career

Participants highlighted a range of appealing aspects of teaching, from fitting with family like (F, 22), to knowing that the teaching qualification is internationally recognised ‘Knowing it’s internationally recognised and I could teach abroad is cool’ (F, 37). Teaching was also seen as a gateway to personal and professional growth, serving as a potential ‘stepping stone to furthering my career beyond teaching’ (F, 21) and offering opportunities to acquire additional skills. For some participants, it was the merging of their interests with a promising career that interested them, ‘the opportunity to teach something that I enjoy and the career progression’ (M, 20).

### 4.6 | Theme 6: Root of Imbalance

This theme explored how teaching compared to other vocational pathways and to career aspirations more generally.

#### 4.6.1 | Imbalance

Participants summarised what they perceived to be the pros and cons of teaching. A proportion of participants felt that although teaching was something they could imagine doing in the future: ‘I like the idea of teaching...[but] not as of right now...I would be open to thinking about it after at least 5 years in industry.’ (M, 19), as presented here, the view that teaching is a role for later in life was recurrent (four males, one female). At times explicit comparisons were made with other careers, ‘I prefer to work as a data scientist ...[the vignettes] have opened my eyes to some parts of teaching that make it more enjoyable, but it is still not enough. ... In industry you have many options to promote while teaching is more vocational.’ (M, 21) This participant identified the enjoyable aspects of teaching but felt opportunities for promotion and progression would be less prevalent. Other responses compared the potential impact of different careers and on balance, felt that teaching did not offer a great enough impact ‘I feel that there are more effective ways to create change, e.g. via government and laws’ (M, 18).

A 20-year-old male participant illustrated the sense of imbalance: initially motivated by helping others, he found the described scenarios appealing, 'I really enjoy helping others, so the described scenarios appealed' However, he recalled being dissuaded from teaching by numerous teachers throughout his schooling. Despite acknowledging positive aspects such as a sense of pride and the rewards of helping students develop, he concluded that teachers are severely overworked noting, '...teachers are severely overworked during term times and the successes you may experience as a teacher are often outweighed by experiences with more difficult students'. This response highlighted his sense of imbalance, with the positives of the career contrasting sharply with the challenges, ultimately deterring him.

The code of Imbalance was the most interconnected code being interrelated with nine other codes.

## 5 | Discussion

The purpose of this study was to understand what knowledge UK STEM undergraduates held about teaching, and which aspects motivated them to teach, and which aspects deterred them. Our results can be summed up with four salient findings about STEM undergraduates' perceptions of teaching as a career.

*Perceptions of Fit:* First, from a motivation perspective, we found that undergraduate STEM students held a clear sense of whether they perceived themselves to be a good fit both in the vocation (Watt et al. 2007) and in a school environment more widely (De Cooman et al. 2009; Player et al. 2017). PV fit is a positive predictor of work-based attitudes (Vogel and Feldman 2009) and correlates with applications into initial teacher education and generalised interest in a teaching career (Klassen, Granger, and Bardach 2023). When considering a role, a candidate will consider, 'Do my knowledge, skills, and attributes fit with those demanded by the profession?' (Klassen et al. 2021; Klassen, Granger, and Bardach 2021). Thus, specific messages about the intricacies of a vocation allow for more positive engagement with, and informed consideration of, career decision-making (Roberson, Collins, and Oreg 2005). Social utility (supporting students in reaching their academic goals and creating a more equitable society) is a common theme in teacher recruitment interventions in the UK (e.g., *Every Lesson shapes a life*, the DfE's advertising campaign). Positive about Supporting Students was the third most populated code behind Negative Treatment and Remuneration, and Workload. The two more populated codes correlate with personal utility (extrinsic) and PV fit: these motivations are an integral elements of career decision-making and, at present, are not attractive enough to ensure that teaching is a sought-after vocation.

*Imbalance:* A second key finding was the sense of imbalance among undergraduate STEM students when considering teaching. Although participants acknowledged clear 'pulls' towards teaching from tangible rewards and emotional gains, they noted an overall imbalance when comparing the career to alternate careers available to a STEM undergraduate. Emotional gains were

associated with a desire to support and help young people in their journey through education into adulthood. Participants who had positive role models in their formative years wanted to replicate this for others, but those who faced difficulties during their schooling were similarly motivated to enter the profession in the hope of offering the support they had wanted. Furthermore, external benefits (pay, holidays) were seen to be generally positive. However, teaching was superseded by other careers due to a perception that alternative employment offered a more equitable work-life balance and that teaching held excessive challenges including challenging students, rigorous inspections perceived as high pressure and unsupportive, and insufficient resources viewed as particularly acute in some settings.

The imbalance between the pros and cons of a teaching career was furthered by a keen awareness of the position in the labour market held by STEM undergraduates (Kunz et al. 2020), with teaching seen as a second career. This finding is in line with Watt, Richardson, and Pietsch' (2009) findings that one-third of science and mathematics teachers had prior careers. However, the higher pay and opportunities in other vocations can make this transition to teaching less attractive to potential teachers (McLean, Worth, and Faulkner-Ellis 2023). No participant who compared teaching to another career concluded that teaching would be a better option.

*Variety of the Role:* Third, participants reflected positively on unexpected aspects of daily teaching activities portrayed in the vignettes. Although many of the responses discussed attractive aspects of teaching which are already known, for example, social utility or person-vocation fit (Richardson and Watt 2016; Vogel and Feldman 2009; Uggerslev, Fassina, and Kraichy 2012), we found that the combination of the second person narrative and presentation of the variety of activities undertaken as a teacher, promoted greater engagement as the vignettes felt 'broader' (M, 19) as they 'cover[ed] the scope of the job' (F, 52). Participants felt able to imagine themselves in those situations (F, 21) and could see them as 'enjoyable' (four participants). In the United Kingdom, those actively interested in teaching can complete work experience in a participating local school via Get into Teaching, but there can be costs relating to DBS checks (Department for Education 2024). The application process and the duration of work experience requires a high level of interest which is not often seen in most of the undergraduate population (Gorard, See, and Morris 2022). Both the scope and the variety of teaching were largely unknown but were seen as attractive.

Finally, and related to our third main finding, our study illuminated how a 'knowledge deficit' about positive aspects of a teaching career could influence undergraduate views Our study showed that undergraduates' conventional and unchallenged perceptions of life as a teacher can be changed after viewing authentic classroom-based vignettes resulting in an appetite to gain a greater holistic understanding of the vocation. This holds a two-fold value: trainees who find there is a disparity between their beliefs about teaching and the reality when entering ITE, are more likely to encounter issues (Wideen, Mayer-Smith, and Moon 1998), and secondly, we found unchallenged perceptions of teaching were leading many participants to being less interested in the career. This knowledge deficit encompassed aspects from starting salary

and the teacher's pension to agency within the classroom and the ability to teach abroad. In contrast to previous studies, we found that personal utility (extrinsic) motivators such as the starting salary and pension contribution were largely seen as attractive, but that they were infrequently known. Although previous research has shown that the use of financial incentives may not increase recruitment (or retention) rates (Allen et al. 2016; Noyes, Geppert, and McIntyre 2019; See et al., 2020), we saw that the current starting wage for teachers was viewed as a motivator. In response to the vignette which outlined that the starting wage was £28,000 (accurate at time of writing), a significant number of responses showed that this was higher than expected, and an attractive starting wage. Some participants were perplexed by the stated wage which conflicted with their vicarious knowledge again highlighting the knowledge deficit.

### 5.1 | Limitations of the Research

Our data source—the open-ended responses from our vignette study—were, on occasion, quite brief and we did not have the scope to offer follow-up interviews to gather deeper data. Our data tended to be wide and thin, lacking the depth found in some qualitative interviews. For example, in some responses, certain aspects of teaching were described, but it was unclear whether participants found these aspects appealing, deterring or neutral. However, the volume of comments from participants provided us with a breadth of participant views not often found in research featuring more in-depth interviews. The representation seen in our study from across the four nations was not representative of the current population of undergraduates, and future studies might replicate this study outside of England, and indeed, internationally.

### 5.2 | Implications for Practice

The responses received showed that motivations for considering teaching as a career varied considerably across individuals. Future recruitment campaigns might look at how a wider range of motivators than are currently used could be included to attract a larger, more diverse pool of potential teachers. The knowledge deficit about working as a teacher was striking—perhaps informed by recent media focus on teacher job action—and covered most aspects of teaching from pay and working conditions, to the day-to-day role of a teacher. It was clear that there was an appetite to know more about the vocation, and that at present, often inaccurate vicarious knowledge was being used to fill the gap. As a result, recruitment campaigns that present broader, more detailed—and authentic—coverage of the positives associated with the profession could be beneficial.

### 5.3 | Future Research

The STEM undergraduate knowledge deficit observed in our study lends itself to further exploration: is the knowledge deficit due to a lack of engagement and interest, or due to conflicting perceptions gleaned from portrayals of teaching in

the media and advertising campaigns? We found that participants were keen to see realistic vignettes that accurately reflected the reality of the profession, 'warts and all', and they welcomed the opportunity to explore content in this format. As a result, further studies might explore how these snapshot 'realistic job previews' could promote interest in prospective teaching candidates.

Future research might explore more deeply the impact of contextual factors on interest in the profession: to what extent do views and opinions about teaching change due to factors such as the current political and economic climate, or generational cohort factors? This study took place with the contextual backdrop of ongoing strikes led by the teachers' unions across all four nations due to perceived underfunding (staff pay and school funding), and poor conditions including 'unmanageable workloads' (Whittaker 2023). We know that interest in teaching as a career varies as a function of the broader economic and political landscape (West, Nagler, and Piopiunik 2020), but we know little about how interest in teaching varies with social and conventional media portrayals of teaching (both positive and negative). We know even less about how to adapt recruitment messages (and indeed, the job itself) to account for differences in the motivations of new generations of prospective teaching cohorts, with Gen Z workers (born in 1990s and 2000s), for example, demanding greater attention to work-life balance and intrinsic motivators than previous generations (Lee et al. 2022).

## 6 | Conclusion

Recruiting teachers is a global challenge and rising rates of early career teacher attrition are exacerbating teacher shortages. Recruitment shortfalls are most acute within STEM (Science, Technology, Engineering, and Mathematics) subjects. By understanding the career decision-making motivations of potential teachers—and their knowledge of teaching as a vocation—policy makers and educational organisations are empowered to take informed steps towards more effective recruitment strategies. In our study, participants were interested in positively impacting the future of children by helping them achieve their goals. Simultaneously, an imbalance was felt when comparing the working conditions in teaching to other careers accessible to STEM undergraduates. Participants felt that behavioural issues, systemic problems and the inflexibility of the role presented very real disincentives to choosing teaching as a career. However, there was a clear knowledge deficit concerning pay, opportunities to incorporate personal interests and the ability to work overseas. Future research using realistic teaching vignettes could help us better understand how to choose and implement relevant motivators to attract the next generations of teachers.

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### Conflicts of Interest

The authors declare no conflicts of interest.

## Data Availability Statement

The data and materials for this study are openly available online: <https://doi.org/10.17605/OSF.IO/YU8MQ>.

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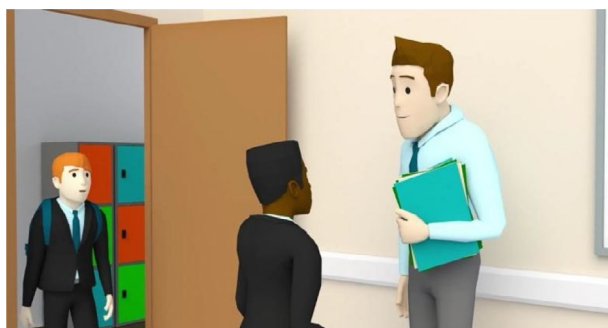
## Appendix A

### Introduction to the Vignettes

#### Example Vignette: Social utility—Shape the Future of Children

Introduction: You have just finished your year-long training to be a secondary school teacher and are beginning your new job as a teacher in a state-funded academy. Imagine that each of these situations happen to you—how does it change your view of teaching as a career choice?

Read the following scenario and then answer the following question: You notice that your tutee, Muhammad is struggling; he is the last to leave for class and arrives to registration on his own. His teachers say he is focused, bright, but has no clear friendship group. You meet with Muhammad to ask how he is settling. He shares that outside of school, he really likes robotics: some Sixth Form pupils are starting a robotics club, you ask if he would be happy to help them plan the club with some other members of his year group: he is really keen! It is a first step, but you can see Muhammad looking brighter already; it feels great knowing you can have such a positive impact.



## Appendix B

### Motivation Labels and Representative Content

Motivation label	Representative content
PU extrinsic (FIT choice) Job security	Over 85% of teaching jobs offer a permanent contract, but there are temporary options if preferred

Motivation label	Representative content
PU extrinsic (FIT choice) Job transferability	Teaching is internationally recognised, so you have the freedom to travel with the vocation
PU extrinsic (FIT choice) Time for family and holidays	Regular holidays which equate to more than the average number of days' annual leave
PU extrinsic (FIT choice) Salary and pension	A starting wage of between £28,000–£44,756 and employer pension contributions of 24%
Social utility (FIT choice) Shape future of children/adolescents/work with children and adolescent	A bright student is struggling to fit in at school, you match his interests to clubs and are thanked for helping to make his time at school more positive
Social utility (FIT choice) Enhance social equity	Promoting your subject—which has unequal gender representation—by engaging with social enterprises that encourage women and girls into science
Social utility (FIT choice) Make social contribution	You build a pen pal relationship between your school and a local older people's home to increase community engagement
PV fit (from Klassen et al. 2021; Klassen, Granger, and Bardach 2021) Resilience and adaptability	You consider the wide range of roles and skills needed over the course of a teaching day
Empathy and communication and emotion management	A student is behaving out of character in a loud and inappropriate manner. Through communicating calmly, they open up to you
Conscientiousness, organisation and planning	Your books are marked, and your lessons are planned which makes an upcoming inspection feel much more manageable
PU intrinsic (Based on Wang & Klassen) Autonomy—determining the way work is done	Your department redesign the core curriculum content as a team, giving every teacher ownership and autonomy
Mastery—opportunity to learn about subject and develop new skills	You take the opportunity to complete a coaching course and find that it fits your skills. You are commended for trying something new