

Research Paper

“Student success is not an individual achievement” – Motivation and teacher education in the digital age

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Abstract

The motivation of student teachers is a key issue in contemporary teacher education, typically examined through psychological theories focusing on individual learning processes. This paper does not aim to provide a comprehensive literature review; instead, it offers a conceptual reflection that pays tribute to the work of Gabriella Pusztai, whose research highlights the social embeddedness of student achievement, integration, and persistence. Building on her approach, the study integrates psychological, pedagogical, and sociological perspectives to reinterpret motivation in pedagogical courses. It proposes a three-dimensional framework consisting of integration, relevance, and identity, emphasising that motivation is a context-dependent and dynamically changing phenomenon. The paper also examines how digital learning environments reshape motivational conditions by influencing autonomy, relatedness, engagement, and perceived relevance. The findings suggest that understanding student motivation requires moving beyond individual-level explanations and recognising the decisive role of relational, institutional, and technological contexts.

Keywords: student teacher motivation; teacher education; social integration; professional identity; digital learning environments

Introduction

The motivation of students participating in teacher education can be considered as one of the key issues of contemporary educational research, which is closely related to the attractiveness of the teaching profession, the effectiveness of training programmes, and also to the chances of remaining in the profession (Day & Gu, 2007; OECD, 2019, 2020). The importance of motivation is especially emphasised by those theoretical approaches which interpret learning not only as a cognitive process, but also as an affective and identity-related one. A common point of these models is that long-term professional commitment can only be developed if students perceive their studies as meaningful, relevant, and at the same time intellectually challenging.

However, in the case of pedagogical courses, several studies point out that these conditions are not always fulfilled. The phenomenon of grade inflation, which is widely documented in the international literature, shows that in higher education – particularly in the fields of humanities and education – grades tend to increase over time, while the differences between student performances become less visible (Bachan, 2017; Johnson, 2003; Norton et al., 2013; Rojstaczer & Healy, 2012; Sabot & Wakeman-Linn, 1991). This phenomenon can be considered as a global tendency, although it appears in a differentiated way across disciplines (Bachan, 2017; Bonesrønning & Opstad, 2015; Norton et al., 2013).

Tasks based on reflection, essays, and portfolios often leave a wider space for interpretation for instructors compared to more standardised and closed forms of assessment (Boud & Falchikov, 2007; Sadler, 2009). At the same time, the massification of higher education, the increasing importance of student satisfaction, and the

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strengthening institutional competition may also contribute to the loosening of assessment standards (Brown, 2015; Norton et al., 2013).

From a motivational point of view, grade inflation is particularly relevant, since the assessment environment has a direct influence on students' learning orientations. If courses can be completed with relatively low risk and high success rates, there is a danger that students' motivation becomes primarily extrinsic, focusing on obtaining good grades, while intrinsic motivation, which would support deeper understanding and professional development, is pushed into the background (Deci & Ryan, 2000; Eccles & Wigfield, 2002; Ryan & Deci, 2017). This problem appears with specific weight in teacher education, as the aim of these programmes is not only the transmission of knowledge, but also the development of pedagogical thinking and professional identity, which determine in the long term the quality and sustainability of teaching practice (Beauchamp & Thomas, 2009; Korthagen, 2010).

A specific paradox of pedagogical courses can be identified here: while they play a central role in the professional development of future teachers, their assessment practices and learning organisation do not necessarily support deep learning based on intrinsic motivation. This makes it justified to examine which pedagogical approaches and learning design strategies are able to generate real engagement among student teachers. Accordingly, the aim of the present study is to explore how pedagogical courses can be transformed into learning environments that provide at the same time professional challenge, relevance, and supportive learning conditions, thus contributing to the development of students' sustained intrinsic motivation.

Perceived Importance and Usefulness of Pedagogical Courses among Student Teachers

The perception of pedagogical courses within teacher education presents a rather ambivalent picture among students. While the primary aim of these courses is to establish professional thinking and to support the development of teacher identity, empirical studies consistently indicate that a considerable proportion of students attribute only limited immediate usefulness to them, especially in the early phase of their studies (Flores, 2016; König et al., 2017; Yuan & Lee, 2016; Yu et al., 2023). The perceived relevance of pedagogical content is fundamentally determined by the extent to which students are able to connect it to concrete teaching situations (Darling-Hammond, 2017; Grossman, 2021; Mena et al., 2017).

At the same time, student perceptions show a dynamic change during the course of training. Several longitudinal studies have demonstrated that the evaluation of pedagogical courses improves significantly after the beginning of teaching practice, when theoretical knowledge becomes more directly applicable (König et al., 2017; Valtonen et al., 2019). This delayed recognition of relevance suggests that pedagogical knowledge in many cases gains its meaning only when it is embedded in practice (Darling-Hammond, 2017; Grossman, 2021).

Active learning forms – such as case analysis, microteaching, or collaborative tasks – also contribute to an increased perception of usefulness and to higher student engagement, as they make the practical relevance of pedagogical knowledge more explicit (Darling-Hammond, 2017; BeiValtonen et al., 2019; Cai et al., 2022).

Overall, research results consistently show that the perceived importance and usefulness of pedagogical courses are strongly context-dependent and change over time. This recognition has direct relevance from the perspective of student motivation, since perceived relevance and applicability play a key role in the development of sustained learning engagement (Eccles & Wigfield, 2002; Ryan & Deci, 2017).

Motivating Student Teachers in Pedagogical Courses

Psychological Theories of Motivation

The issue of motivating student teachers in pedagogical courses can be interpreted in an adequate way only within a theoretical framework which is able to capture at the same time the psychological, pedagogical, and professional identity-related dimensions of learning. According to self-determination theory, sustained and deep learning engagement is based on the satisfaction of three basic psychological needs: autonomy, competence, and relatedness (Deci & Ryan, 2000; Ryan & Deci, 2017). Empirical studies have shown that the intrinsic motivation of student teachers is closely connected to the autonomy-supportive character of the learning environment and to the availability of reflective learning opportunities (Niemiec & Ryan, 2009; Reeve, 2012). Pedagogical courses which provide possibilities for choice, give space to student opinions, and encourage independent thinking tend to result in a significantly higher level of engagement.

Recent empirical research clearly indicates that autonomy-supportive learning environments, the perceived relevance of courses, and the development of professional identity operate as a mutually reinforcing

system (Bureau et al., 2022; Cai et al., 2022; Tan & Levesque-Bristol, 2024; Yu et al., 2023). According to a large-scale meta-analysis, teacher autonomy support is a stronger predictor of students' psychological need satisfaction and self-determined motivation than other socialisation factors (Bureau et al., 2022).

In the context of teacher education, this is of particular importance, since pedagogical courses implicitly also transmit models of teaching. The study of Tan and Levesque-Bristol (2024) shows that student teachers who participate in autonomy-supportive learning environments are more likely to intend to apply similar approaches in their own future teaching practice. In this sense, the motivating power of pedagogical courses also depends on the extent to which the course itself models desirable pedagogical practices.

One of the key issues of motivational problems in pedagogical courses is the question of perceived relevance, which is a central element of expectancy–value theory (Eccles & Wigfield, 2002, 2020). According to this model, students' motivation is determined mainly by two factors: their belief in success and the value they attribute to the activity. In the case of student teachers, pedagogical courses often have a relatively low value in the initial phase of training, since students do not perceive a direct connection between these courses and their future teaching work (Flores, 2016; König et al., 2017).

Learning environments which explicitly connect theoretical content to concrete teaching situations can significantly increase students' sense of relevance and their learning engagement (Darling-Hammond, 2017; Hulleman & Harackiewicz, 2009).

The perceived value of pedagogical courses can be considered as a construct which changes over time. A longitudinal study by Yu et al. (2023) shows that pre-service teachers' competence beliefs, career values, and perceptions of the teaching profession develop dynamically during the training process, and may even decrease if students have limited access to real school experiences in the early phase of their studies.

The quality of motivation is also determined by the types of goals students pursue in the learning process. Achievement goal theory distinguishes between performance-oriented and mastery-oriented goals (Ames, 1992; Kaplan & Maehr, 2007). In the case of pedagogical courses, surface learning is often associated with a performance-oriented approach, when students' primary aim is to obtain good grades. In contrast, mastery-oriented learning environments – which emphasise understanding, development, and learning from mistakes – support deeper learning and the development of sustained motivation.

Teacher Identity and Motivation

The motivation of student teachers cannot be separated from the development of their professional identity. Research findings indicate that the formation of teacher identity is closely related to learning experiences and to the experiences gained in pedagogical courses (Beauchamp & Thomas, 2009; Flores & Day, 2006; Beijaard et al., 2023; Flores, 2020). Teacher identity is not a static entity, but rather a dynamic construct which is continuously shaped by experiences during the training process, in the course of which students gradually develop their own professional self-understanding (Beijaard et al., 2023). Courses that provide opportunities for students to interpret their own teaching role in a reflective way tend to strengthen professional commitment and intrinsic motivation, as they support the attribution of personal meaning to learning experiences (Flores, 2020; Yuan & Lee, 2021).

Reflective practices, mentored teaching experiences, and collaborative forms of learning are particularly effective in this process, since they enable students to interpret their own experiences within theoretical frameworks (Flores & Day, 2006; Korthagen, 2010). Empirical studies suggest that such learning environments not only support identity development, but also strengthen learning engagement and the sense of self-efficacy, which are key components of motivation (Cai et al., 2022; Leijen et al., 2022). Furthermore, community-based and collaborative learning forms contribute to the interpretation of the teaching role in a social and professional context, which in turn reinforces professional commitment and attachment to the profession (Trent, 2020).

For this reason, the motivating potential of pedagogical courses cannot be considered independently from the extent to which they support the development of students' teacher self-concept. Recent research also points out that professional identity development and motivation function as mutually reinforcing processes: a stronger identity is associated with higher levels of engagement and more sustained commitment, while positive learning experiences contribute to the stabilisation of identity (Cai et al., 2022).

Motivation is also influenced by the level of stress generated by the training environment. The findings of Núñez-Regueiro et al. (2024) suggest that student teachers may be highly motivated towards the profession, while at the same time experiencing the training process itself as a significant source of stress. A lack of structure in the training environment, as well as excessive and non-transparent expectations, tend to weaken motivation

and learning engagement. In contrast, clear structures, predictable requirements, and a supportive learning environment reduce stress levels and indirectly strengthen intrinsic motivation (McCarthy et al., 2022; Collie, 2023).

This aspect is of particular importance from the perspective of designing pedagogical courses, since it highlights that maintaining motivation is not only a question of providing inspiring content, but also of creating a learning environment in which expectations are transparent, the learning process is well structured, and reflective activities appear not as an excessive burden, but rather as a developmental opportunity.

The Social Embeddedness of Student Motivation: Gabriella Pusztai's Model of Integration and Persistence

A Sociological Complement to Psychological Models

Psychological models pay relatively limited attention to the social and institutional context within which these mechanisms operate. This gap is productively addressed by Gabriella Pusztai's integration- and persistence-based approach (Pusztai, 2011, 2015, Pusztai et al., 2019).

Empirical studies conducted by Pusztai consistently demonstrate that student achievement and persistence cannot be interpreted solely as individual performance, but rather as a function of institutional and social embeddedness. Students' academic trajectories are fundamentally shaped by the quality and density of their relational networks, by the extent to which they are integrated into institutional communities, and by the types of interactions they establish with their instructors and peers. This approach shows a close connection to integration models present in the international literature (Tinto, 2012), while at the same time placing a stronger emphasis on the role of social capital and community-based resources.

Horizontal and Vertical Relationships

Pusztai's research also indicates that not only the existence of relationships, but also their structure and quality are of decisive importance. Horizontal relationships, that is, those among students, and vertical relationships, that is, between instructors and students, contribute to academic success in different ways. Student communities primarily influence outcomes through social support and collaborative learning, whereas relationships with instructors play a key role in shaping professional orientation and in the internalisation of academic norms (Pusztai, 2015; Pusztai & Szabó, 2020). This distinction is particularly relevant in the context of teacher education, where professional socialisation cannot be separated from community-based learning processes.

Integration as a Motivational Mechanism

The influence of relational networks is realised in a mediated way. In several analyses, Pusztai points out that the relationship between institutional integration and academic success is mediated by intermediate variables such as academic commitment, learning activity, and – in an implicit way – motivation (Pusztai, 2011; Pusztai et al., 2019). This recognition can be well connected to motivational theoretical frameworks: relational embeddedness strengthens the experience of relatedness, which, according to self-determination theory, is one of the basic conditions of intrinsic motivation (Deci & Ryan, 2000; Ryan & Deci, 2020). In this sense, social integration should not be considered merely as a background factor, but rather as one of the determining mechanisms of motivational processes.

Specific Patterns among Student Teachers

In the case of students participating in teacher education, the studies of Pusztai and her colleagues reveal specific patterns. This group of students is typically characterised by a stronger normative and value-based orientation, which can be related to the social significance of the profession and to the dominance of helping attitudes (Pusztai, 2015; Pusztai et al., 2022). At the same time, however, a relatively lower perceived instrumental usefulness of academic activities can often be observed, especially in the early phase of training. This duality – the coexistence of strong normative commitment and low utility value – results in a specific tension within motivation, which can be well interpreted within the framework of expectancy–value theory (Eccles & Wigfield, 2020).

Persistence, Resilience, and the Digital Environment

In Pusztai's more recent works, the questions of student persistence and resilience also come into the foreground, especially in the context of a changing higher education environment and the expansion of digital learning spaces (Pusztai, 2022). These studies indicate that relational networks not only support academic success, but also function as protective factors against dropout. In contrast, the lack of community embeddedness increases the risk of decreasing motivation and the emergence of disengagement, which becomes particularly relevant in digital learning environments, where relationships are often more fragmented.

Motivation as a Context-Dependent Phenomenon: Integration, Relevance, and Identity

Based on the theoretical approaches presented above, the motivation of student teachers can be interpreted as the result of several interrelated factors.

On the basis of a combined reading of these models and the work of Gabriella Pusztai, a three-dimensional interpretative framework can be outlined, in which the motivation related to pedagogical courses can be understood through the interrelation of integration, relevance, and identity. Integration refers to the relational and institutional embeddedness of students; relevance denotes the perceived usefulness and practical value of pedagogical content; while identity includes the process of normative acceptance of the teaching role. Within this framework, motivation is not merely an internal driving force, but rather a dynamic and socially embedded process, which is shaped by institutional structures, community experiences, and the quality of the learning environment.

Why Does the Digital Space Become a Key Issue?

If motivation depends to such a strong extent on the quality of the learning environment, then the question of how digital learning environments transform these conditions becomes of particular importance. The digital space has the potential both to support and to weaken autonomy, relatedness, the sense of competence, the experience of relevance, and learning engagement. For this reason, from the perspective of the future of pedagogical courses, the key question is not whether digital technology is present in teacher education, but rather according to what kind of pedagogical logic student motivation is organised through it.

Motivation and Activation through Digital Technology

The emergence and continuous development of digital technology in education have opened a new chapter in teaching and learning processes (Hughes & Roblyer, 2022). The initial phase was marked by the introduction of computers and projectors, which significantly expanded the possibilities for visual representation. Even the ability to project a large number of illustrations quickly and efficiently represented a considerable advancement. Soon, digital animations and videos also appeared in classrooms, which had previously been accessible only via television. However, the limited size of television screens posed constraints, whereas projectors enabled much larger visual displays. As a result, more complex and detailed visual materials could be presented effectively, including those that had previously been unusable due to size limitations.

This qualitative shift in visualisation initially had a positive impact on most students: it became much easier to capture their attention, which in turn increased their level of motivation. However, their level of activity did not change, even with the introduction of new tools. Moreover, for some instructors, the availability of digital tools increased the tendency to rely on frontal teaching methods, resulting in visually impressive yet pedagogically passive sessions. Digital presentation may also negatively affect the pacing of lessons. Without careful attention, slides containing textual content can accelerate the flow of the class, as there is no need to erase the board. As a result, on the one hand slower note-takers may fall behind, on the other hand, sustained intensive attention can become cognitively exhausting.

Visualisation can also be enhanced through other digital tools, such as Augmented Reality (AR) and Virtual Reality (VR), which have opened entirely new dimensions in this field (Al-Ansi et al., 2023). Compared to traditional two-dimensional images and videos, these technologies offer a higher level of immersion and can engage multiple sensory channels. Perhaps their greatest benefit is that students are no longer passive recipients but active participants in the visualisation process. In the case of AR, which enriches the real physical environment with digitally generated virtual elements, students typically scan a so-called trigger image using a camera-enabled device and appropriate software. This trigger image is usually a specific picture or diagram, though some systems allow classroom objects to serve as triggers. The resulting virtual content may include not

only static or moving images but also interactive three-dimensional models that allow users to explore, for example, a famous building, a functioning engine, or various organs of the human body.

While AR can be effectively used even in lectures, VR is more suitable for seminars and practical sessions, as it requires specialised headsets or PC VR headsets. Through VR, learners enter a three-dimensional virtual space, interacting primarily through visual and auditory channels, increasingly complemented by physical movement (via controllers) and, in some cases, tactile feedback through sensor-equipped gloves.

The immersive nature of VR creates the illusion that users are physically present in the software generated environment, observing its elements from their own perspective. VR enables students not only to explore different locations and living organisms but also to experience situations and events that would otherwise be inaccessible (Young et al., 2020). This technology is increasingly used in professional training, allowing students to practice skills in a safe environment—for example, exploring industrial facilities, performing assembly tasks, or even conducting virtual surgical procedures. Such solutions not only capture students' attention but also motivate them to complete tasks and actively engage in their own learning processes. The high level of immersion often distracts learners from the fact that they are engaged in a learning activity, making tasks feel less burdensome; this same immersive quality reduces the perceived cognitive load of learning, as the virtual environment can be so absorbing that students become deeply engaged in the task.

The potential of AR and VR clearly demonstrates that digital technology not only enhances visualisation-based motivation but also facilitates student activation and active participation in the learning process. Student response systems are designed precisely for this purpose.

Student response systems (also known as personal response systems) represent a hardware and software environment in which students respond to questions by pressing physical or virtual buttons. During the instructor-controlled process, responses are automatically evaluated and aggregated, and feedback is provided immediately. In their early stages (early 2000s), these systems were primarily based on clickers—handheld devices roughly palm sized with buttons for answering questions. Simpler versions allowed responses to basic question types, while more advanced models with displays supported more complex tasks, such as ranking or multiple-choice questions. The most modern devices even allow short textual or formula-based responses (Simpson & Oliver, 2007). For a time, the mere presence of these devices was motivating, as students rarely encountered such tools elsewhere. However, with the widespread adoption of smartphones and tablets, their popularity declined, as these devices effectively replaced clickers. This shift was significant because removing the hardware constraints allowed the benefits of response systems to be utilised more broadly.

Such systems allow a larger number of students to be actively involved and provide instructors with accurate, real-time feedback on students' level of understanding. The possibility of anonymous participation reduces anxiety, encouraging even typically passive students to engage. Students can also submit anonymous questions, further enhancing interaction. Since these systems not only mark responses instantly but also measure response times and convert results into points, they can be used to organise fast paced, engaging competitions. Research indicates that their use increases participation, improves attention, and strengthens motivation, particularly in large lectures (Russel, 2008). In some cases, collaborative features allow students to work in groups. Collaborative work with peers is itself a key motivational factor (Ma, 2025).

Digital technology also supports collaboration in many other ways. Numerous tools facilitate the sharing of ideas and the co creation of content, whether students work synchronously or asynchronously on the same task. In such cases, digital technology not only supports but also expands horizontal learning relationships, enabling collaboration even across national borders. Students can learn about each other's cultures and living conditions, and importantly, they learn from one another. The experience of co creation enhances engagement and strengthens the sense of belonging to a learning community (Vardakosta et al., 2022), which is one of the strongest predictors of motivation.

So the digitalisation has therefore brought significant changes to teaching and learning processes, but perhaps the most important impact is the strengthening of learner autonomy. Digital technology provides students with greater freedom in choosing their learning pathways, pace, and resources—an important factor, as the Self Determination Theory (Deci & Ryan, 2000) posits that autonomy enhances intrinsic motivation. In synchronous learning environments, instructors can tailor materials and tasks to students' needs and abilities, but the pace remains uniform. In contrast, online asynchronous solutions offer exceptional opportunities for learners to acquire knowledge at their own pace and according to their own schedules. Learning via the internet also means that the location of learning becomes flexible. These advantages are highly appealing, which is why many choose e learning when available. However, despite its attractiveness, self-paced learning is suitable only for those who are sufficiently motivated, disciplined, and willing to learn independently. Increased autonomy

therefore creates self-regulation challenges, and motivation can easily decline in digital learning environments. Consequently, both learning materials and platforms must support learners. Empirical studies show that flexible and varied learning materials increase students' motivation and persistence (Bakkar & Ziden, 2023). Wiseman et al. (2016) emphasise that digital learning environments require tasks that capture students' attention and fully engage their cognitive, behavioural, and emotional resources. Learning management systems (e.g., Canvas, Moodle, Blackboard) not only deliver content but can also automatically assess certain tasks and provide immediate feedback. Students' motivation increases significantly when they can continuously monitor their own progress and performance (Veytia Bucheli, 2024).

Digital escape rooms and gamification elements (e.g., leaderboards, badges) have similar effects. These solutions make progress visible, increasing participation and enhancing the learning experience. According to Sailer and Homner (2020), environments that allow both competitive and collaborative interactions are particularly beneficial. For example, when students work in teams while competing against other teams, their performance and skills improve. In individual tasks, transparent badge systems—rewarding not only task completion but also helping peers—can also be motivating (Yildirim, 2017).

The widespread adoption of artificial intelligence (AI) has further expanded the possibilities for motivation and engagement (Jia & Tu, 2024). AI-based adaptive learning systems are able to tailor tasks and various learning materials to students' prior knowledge, learning pace, and error patterns far more accurately than previous solutions. With their assistance, fully personalized support can be provided, especially for learners with special needs (Binhammad et al., 2024). As a result, students can participate in the learning process with greater enthusiasm and motivation from the outset, and this positive effect can be further enhanced by tasks that best match their individual preferences.

Summary

Over the past decades, digital technology has radically transformed teaching learning processes and learning environments (Teoh et al., 2025). New tools and applications have not only reshaped the conditions and organisation of learning but have also significantly influenced students' motivation, engagement, and learning strategies (Benavides et al., 2020). Learner autonomy has increased substantially, along with the demand for immediate feedback and personalised learning. At the same time, the strategies instructors use to influence student motivation and activity have also changed.

It is important to emphasize that the use of digital technology in itself does not guarantee student engagement, nor does it automatically activate learners. Its effectiveness depends on pedagogical design; without this, content-centred methods that maintain student passivity may easily persist. The goal is to ensure that students increasingly become active constructors of knowledge who not only receive learning content but also create it. Such a shift, however, can only be achieved if instructors also adapt to the new environment and consciously plan the pedagogical integration of digital tools.

Artificial intelligence can provide substantial support in this process. AI-based solutions are capable of designing entire course programmes or the content of specific lessons. They can take into account the type of knowledge to be taught, learner characteristics, and the available conditions (including technological resources). They can incorporate specific methodological requirements, preferred forms of learning activities, and can also offer suggestions for student tasks. Their use makes it possible to monitor learners' progress, precisely identify where they need support, and determine the areas in which they perform best. AI can also assist instructors in the form of continuously available chatbots. Since chatbots do not require waiting time, they can provide immediate answers to students' questions and dilemmas (Chanda, 2025), reducing frustration and increasing motivation to learn.

At the same time, alongside the many positive effects, artificial intelligence may amplify pre-existing problems and introduce previously unknown risk factors. The intensive use of AI-based solutions may not only maintain but also exacerbate technological inequalities (Bulathwela et al., 2024), contribute to digital fatigue (An et al., 2025), foster learners' dependence on technology (Rahman et al., 2023), and may even induce metacognitive 'laziness' (Fan et al., 2025).

Based on current trends, there is no doubt that technology will play a central role in motivating and activating students in future learner-centred higher education. However, the responsible use of technology—particularly artificial intelligence—will also confront educators with challenges that may be difficult to address.

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