

Supporting the self-efficacy of novice teachers

Apoiando la autoeficácia de los profesores principiantes

Apoiando a autoeficácia de professores principiantes

David B. Morris¹

<https://orcid.org/0000-0002-2964-8869>

¹ St. Mary's College of Maryland – Estados Unidos. E-mail: dbmorris@smcm.edu.

Abstract

When administrators struggle to retain new teachers, the quality of learning and instruction at a school can suffer. This problem may be ameliorated by providing the support novice teachers need to develop a resilient sense of efficacy. Drawing on research informed by Bandura's (1997) social cognitive theory, I provide practical recommendations for those who work with teachers in the early stages of their careers. These include (a) providing professional development that enhances novice teachers' knowledge and skills, (b) making instructional demands manageable, (c) offering meaningful and individualized feedback, and (d) creating formal systems of mentorship and collaboration. These recommendations serve as a general guide to be adapted according to the needs of schools and their teachers.

Keywords: Teacher self-efficacy. Sources. Novice teachers. Leadership. Social cognitive theory.

Resumen

Cuando los administradores enfrentan dificultades para retener a los nuevos docentes, la calidad del aprendizaje y la enseñanza en una escuela puede verse afectada. Este problema puede mitigarse proporcionando el apoyo que los docentes novatos necesitan para desarrollar un sentido de autoeficacia resiliente. Basándome en investigaciones fundamentadas en la teoría social cognitiva de Bandura (1997), ofrezco recomendaciones prácticas para quienes trabajan con docentes en las etapas iniciales de sus carreras. Estas incluyen (a) ofrecer desarrollo profesional que mejore los conocimientos y habilidades de los docentes novatos, (b) hacer que las demandas instruccionales sean manejables, (c) brindar retroalimentación significativa e individualizada, y (d) crear sistemas formales de mentoría y colaboración. Estas recomendaciones sirven como una guía general que debe adaptarse a las necesidades de las escuelas y sus docentes.

Palabras clave: Autoeficacia docente. Fuentes de autoeficacia. Profesores principiantes. Liderazgo. Teoría social cognitiva.



Resumo

Quando os administradores lutam para reter novos professores, a qualidade da aprendizagem e do ensino numa escola pode ser prejudicada. Este problema pode ser atenuado fornecendo-se o apoio de que os professores novatos necessitam para desenvolver um sentido resiliente de eficácia. Com base na investigação baseada na teoria social cognitiva de Bandura (1997), forneço recomendações práticas para aqueles que trabalham com professores nas fases iniciais das suas carreiras. Estas incluem (a) proporcionar desenvolvimento profissional que melhore os conhecimentos e competências dos professores principiantes, (b) tornar as exigências instrucionais geríveis, (c) oferecer feedback significativo e individualizado, e (d) criar sistemas formais de orientação e colaboração. Estas recomendações servem como um guia geral a ser adaptado de acordo com as necessidades das escolas e dos seus professores.

Palavras-chave: Autoeficácia docente. Fontes. Professores principiantes. Liderança. Teoria social cognitiva.

When administrators struggle to retain new teachers, the quality of learning and instruction at a school can suffer (Sorensen; Ladd, 2020). From the perspective of Bandura's (1986) social cognitive theory, this problem may be ameliorated by supporting novice instructors' teaching self-efficacy – their beliefs about their instructional capabilities. In general, teachers who have high self-efficacy tend to be more motivated, psychologically healthier, and more effective in their instruction (for a review, see Zee; Koomen, 2016). Teachers who are new to the profession appear to benefit similarly from high self-efficacy beliefs; those who see themselves as capable report higher intrinsic motivation, greater job satisfaction, more commitment to the profession, and a higher quality of instruction (De Neve; Devos; Tuytens, 2015; Hatlevik; Hatlevik, 2024; Thomas *et al.*, 2020). Administrators and supervisors can play an important role in helping novice teachers develop and maintain these beliefs.

Whereas preservice teachers' self-efficacy typically increases during teacher education, their self-efficacy beliefs can plummet in their first year of teaching (Thomson *et al.*, 2022; Thomson; Huggins; Williams, 2019; Woolfolk Hoy; Burke-Spero, 2005). This suggests that they need continued support as they enter their own classrooms. Indeed, Woolfolk Hoy and Burke-Spero (2005) found that changes in teachers' self-efficacy from the end of their student teaching to the end of their first year were positively associated with the support they received when they started their career. Similarly, Thomas *et al.* (2020) found that novice teachers tend to be more self-efficacious in schools with transformational leaders – those who offer

individualized support, feedback, and respect for autonomy. But in these studies, as in many others, support was measured as a multifaceted construct. This helps to establish that the support teachers receive matters but leaves open the question of which kind of support matters.

According to Bandura (1997), self-efficacy can be enhanced by attending to four sources of information: enactive experiences, vicarious experiences, social persuasions, and physiological and affective states. Enactive experiences refer to teachers' instructional performances and attainment of instructional goals, from which a sense of past success or failure can be inferred. Teachers who meet their goals (e.g., motivating students, managing classroom behaviors) tend to feel more capable than those who struggle to do so. Vicarious experiences are derived from observing instruction, either in person or through symbolic means (e.g., video, descriptions in print). Teachers can gain knowledge and inspiration when others model the skills necessary to succeed. They can also reflect on their capabilities through self-modeling, in which they envision themselves in teaching scenarios or watch videos of their past instruction. Social persuasions are messages that convey evaluations of instructional competence. These can be explicit (e.g., positive evaluations from a supervisor) or implicit (e.g., being asked to lead a workshop). Finally, physiological and affective states like stress, emotions, and fatigue can be “read” as indicants of capability. For example, a teacher may interpret their anxiety as a sign that they are ill-prepared.

The influence of these sources can vary according to how much experience teachers have in the classroom. When judging their capabilities, novice teachers have fewer experiences to draw from. As a result, their self-efficacy can fluctuate considerably with each new experience (Naidoo; Naidoo, 2023). A single event may be a “drop in the bucket” for an experienced teacher but have dramatic implications for someone still developing a sense of their capabilities (Morris; Usher, 2011). Moreover, whereas enactive experiences are typically the most powerful source of self-efficacy, novices who lack these experiences may look to other sources of self-efficacy (Bandura, 1997; Tschannen-Moran; Hoy; Hoy, 1998). Vicarious experiences and social persuasions are likely most critical when teachers first enter the classroom and have few instructional experiences on which to base their perceptions of capability. But as novice teachers accumulate more experience, their successes and failures can have a profound influence on their developing sense of efficacy (Gale *et al.*, 2021; Tschannen-Moran; Woolfolk Hoy, 2007).

The purpose of this article is to provide practical recommendations for administrators and others who wish to support the self-efficacy of teachers in the early stages of their careers. These recommendations are based largely on Bandura's (1997) descriptions of the sources of self-efficacy. Research on the sources of teaching self-efficacy tends to rely on qualitative and cross-sectional designs that provide little evidence of causality (Morris; Usher; Chen, 2017). Nevertheless, four implications of the work to date appear to be clear. These include the need for (a) professional development that enhance teachers' knowledge and skills, (b) manageable instructional demands, (c) meaningful and individualized feedback, and (d) formal systems of mentorship and collaboration. I elaborate on each of these points in the sections that follow and end by emphasizing the need to apply these general guidelines in ways that are sensitive to the needs of the school and the teachers within it.

1 Provide professional development to enhance teachers' knowledge and skills

The goal of supporting self-efficacy should not be confused with an effort to artificially inflate people's self-beliefs. To maintain a resilient sense of efficacy, teachers must develop the prerequisite knowledge and skills. These include knowledge of the content they will teach, the pedagogical tools they can use, and the instructional technologies at their disposal (Mishra; Koehler, 2006). Teachers who are more knowledgeable in these areas tend to be more self-efficacious (Yildiz Durak *et al.*, 2023; Zeng; Wang; Li, 2022). This is especially true in the early years of a teaching career, when they have less experience but find some reassurance in knowing what to do when they have the opportunity (Zeng; Wang; Li, 2022). Professional development designed to enhance teachers' knowledge and skills can have a profound influence on their self-efficacy (Han, 2023; Zhou *et al.*, 2023). The association between high-quality professional development and self-efficacy may be particularly strong for novice teachers (Hatlevik; Hatlevik, 2024; Helms-Lorenz *et al.*, 2012).

Teachers' competence – and beliefs about their competence – can be enhanced through opportunities to expand their content knowledge. Research to date suggests that teachers who know the material well are more likely to believe they are capable of teaching it. Those who completed more high-quality coursework in their subject area report feeling better equipped to teach the content (Chen; Wu; Hsin, 2022; Mulholland; Dorman; Odgers, 2004). Moreover,

when tested on their content knowledge, self-efficacious teachers typically outperform their peers (Alessio, 2018; Ozturk; Yilmaz-Tuzun, 2022; Velthuis; Fisser; Pieters, 2014). In general, teachers' gains in content knowledge are associated with higher self-efficacy beliefs (Thomson *et al.*, 2022).

It is therefore no surprise that teachers tend to report higher self-efficacy following workshops and courses that enhance their understanding of the content they teach (Carney *et al.*, 2016). Professional development of this type may be especially necessary in elementary settings. When it comes to teaching subject-specific material, elementary teachers tend to report lower teaching self-efficacy (Schwarzaupt *et al.*, 2021; Teig; Scherer; Nilsen, 2019). As Teig, Scherer and Nilsen (2019) noted, secondary teachers typically specialize in a subject as undergraduates and in doing so develop a deep knowledge of the content they will teach. Elementary teachers, on the other hand, are usually responsible for teaching multiple subjects and thus have a broader background in core subject material. For this reason, self-efficacy interventions for elementary teachers are often designed, at least in part, to improve their understanding of content.

Whereas knowing the content tends to make people feel more capable of teaching a subject, they must also learn how to translate that knowledge to their students – and that requires pedagogical knowledge. Bandura (1996) suggested that people can be introduced to new professional tasks through modeling, guided practice, and self-directed practice. In one experimental study, Kleickmann *et al.* (2016) demonstrated that scaffolding professional development improved teachers' self-efficacy, their use of target instructional strategies, and their students' achievement. Similarly, in Tschannen-Moran and McMaster's (2009) quasi-experiment, teachers became most self-efficacious when they (a) learned about a reading strategy, (b) saw it modeled by a presenter, (c) practiced it in groups, and (d) received feedback after implementing it in their classroom.

Novice teachers may benefit most from experiences that help them develop content knowledge while being shown how that content can be taught in the classroom (Brick *et al.*, 2021; Enderle *et al.*, 2014). For example, K-12 teachers felt more capable of teaching mathematics following a course in which instructors modeled how to push students to think about mathematical concepts, encourage their use of other strategies, and correct their misunderstandings (Carney *et al.*, 2016). Such opportunities can also equip teachers with activities that might be useful in their own classrooms (Swackhamer *et al.*, 2009). When

content-focused professional development is infused with pedagogy, it can enhance teachers' self-efficacy and instruction even if it fails to improve their content knowledge (Gardner; Glassmeyer; Worthy, 2019).

Of course, the effectiveness of professional development depends not just on *what* is covered, but *how* it is covered. Novice teachers gain more from working with competent guides, who can provide richer vicarious experiences and social persuasions (Bandura, 1997). The structure of professional development likely matters as well. In their multi-country study, Gümüş and Bellibaş (2023) found that job-embedded professional development (e.g., mentoring, action research) was a better predictor of teaching self-efficacy than traditional professional development activities (e.g., courses, conferences). This may reflect a difference in work demands. When professional development is offered outside of regular school hours, teachers have less time to rest and prepare. Unsurprisingly, those who engage in work-related tasks outside of working hours report greater fatigue (Garrick *et al.*, 2018). This may be particularly pronounced for novice teachers, who as described in the following section, already contend with many demands that threaten their self-efficacy development.

2 Make instructional demands manageable

Novice teachers cannot be expected to manage the same work demands as an experienced teacher. They have not had time to curate a “bag of tricks” – strategies and lessons that have worked in the past. When planning for classes, experienced teachers can use previous lesson plans and materials, drawing on past successes and failures to improve them. Novice teachers not only lack these but often contend with other demands – such as additional coursework or professional development. In qualitative studies, novices have described a high workload as a major source of stress and a reason to consider leaving the profession (Dias-Lacy; Guirguis, 2017; McCann; Johannessen, 2004; Shoffner, 2011). They have noted how tasks that may take experienced teachers little time can take them much longer, detracting from their teaching and in turn their development of self-efficacy (Ma; Chutiya; Nicoll, 2022). In general, the more teachers perceive their workloads to be unmanageable, the lower their self-efficacy tends to be (Cayupe *et al.*, 2023; Collie; Shapka; Perry, 2012).

One way to alleviate this burden is to make novice teachers' courseload reasonable and well-aligned with their expertise. In some countries, for example, it is not rare for a teacher who

certified in social studies to teach classes on government, economics, psychology, and geography. This creates a substantial amount of work for teachers who have few past materials to draw from. Inexperienced teachers who are responsible for more class preparations tend to have lower self-efficacy and are more likely to leave the profession (Knobloch, 2006; Wolf, Foster; Birkenholz, 2010). Teachers also report lower self-efficacy for courses outside their area of expertise (Palermo Kelly; Krakehl, 2022; Ross *et al.*, 1999). It is more appropriate to assign novice teachers multiple classes of the same type in content areas for which they are best prepared. In elementary contexts, this may involve a “divide and conquer” approach in which teachers work on teams and are responsible for different core subjects.

Another consideration is that new teachers are less likely to flourish in challenging classrooms. This can occur when teachers with seniority are given priority in course selection or when novice teachers in alternative certification programs are placed in high-needs schools. Teachers are generally more self-efficacious in classrooms with high-achieving students (Fackler; Malmberg; Sammons, 2021; Klassen; Tze, 2014). They are also more self-efficacious when students show signs of engagement (Fackler; Malmberg; Sammons, 2021; Raudenbush; Rowan; Cheong, 1992; Ross; Bradley Cousins; Gadalla, 1996). Despite their inexperience, novices are adept at recognizing student behaviors that reflect engagement (Seidel *et al.*, 2021). They tend to have less faith in their capabilities when students exhibit severe behaviors that are difficult to manage (Giallo; Little, 2003). Research by Collie, Shapka and Perry (2012) suggests that the stress – a negative physiological state – is at least partially to blame for the relationship between student behavior and teaching self-efficacy. Beginning teachers who describe their work as psychologically and emotionally demanding tend to have lower self-efficacy (Björk *et al.*, 2019). In the earliest stages of their career, they should be placed in contexts most likely to foster positive enactive experiences and reduce negative physiological and affective states. Students who struggle with academics or behavior are best served by teachers who have had time to hone their skills for supporting student engagement and learning (Brantlinger, 2020).

3 Provide meaningful and individualized feedback

Feedback is essential to new teachers as they begin their careers. Novice teachers who are observed frequently tend to have higher self-efficacy than teachers whose supervisors take a laissez-faire approach (Chester; Beaudin, 1996). But the influence of these observations on

their self-efficacy beliefs likely depends on the quality of the feedback they receive and the relationship they have formed with the supervisor.

Bandura (1997) noted that social persuasions are most powerful when they are sincere and well-informed. Such feedback may be particularly important for novice teachers who arrive in schools through alternative certification programs without the preparation and scaffolding offered by traditional teacher education programs. Garrison-Wilhelm, Woods and Kara (2021) found that, of many types of formal supports, instructional support from school administrators had the greatest influence on the self-efficacy of alternatively certified novice teachers. In follow-up interviews, the teachers described benefiting most from principals or assistant principals who established meaningful relationships with them and provided specific feedback following observations. Novice teachers may put less stock in feedback delivered by administrators who observe them infrequently and base their opinions on only a “thin slice” of what happens in their classrooms (Morris; Usher, 2011).

Feedback is also most effective when it is specific and provides the tools novice teachers need to improve their instruction. Tschannen-Moran and McMaster (2009) likened this to a form of coaching. People benefit from learning not only what they did well or poorly, but also how to maximize their likelihood of future success (Hattie; Timperley, 2007; Wisniewski; Zierer; Hattie, 2020). However, Klassen and Durksen (2014) noted that sincere feedback “plays a double-edged role” (p. 166). Positive evaluations can increase novice teachers’ self-efficacy beliefs, but negative evaluations can potentially undermine them.

It is therefore critical that supervisors also help teachers frame their experiences and feelings in adaptive ways. Novice teachers often contend with negative physiological and affective states that threaten their sense of efficacy. They experience higher levels of distress than teachers in middle or late stages of their careers (Admiraal *et al.*, 2023). Dicke *et al.* (2015) found that novices’ emotional exhaustion tends to increase throughout their first year of teaching, predicting decreases in their self-efficacy (Dicke *et al.*, 2015). Administrators and mentors who work with new teachers can provide the perspective they need to make sense of their experiences and view their feelings as normal. This is particularly critical when those experiences involve failure of some kind. Gardner (1997) noted that successful individuals tend to view errors and setbacks in ways that help them improve without undermining their self-beliefs. The same can be said of successful teachers who view negative evaluations and teaching experiences as information that can help when planning future classes (Morris; Usher, 2011).

Framing failures in these adaptive ways can help teachers maintain their self-efficacy. Experienced supervisors have the credibility and knowledge to guide novices as they process the negative experiences and emotions that are all but inevitable in the first year.

There is an important distinction between providing novice teachers with feedback and micromanaging them. A substantial body of research has demonstrated that people's motivation suffers when their autonomy is not respected (Ryan; Deci, 2017). Controlling approaches can undermine novice teachers' self-efficacy beliefs (Björk *et al.*, 2019; De Neve; Devos; Tuytens, 2015). It is one thing for an administrator to provide a suggestion and quite another to demand a change. Of course, there are times when school administrators must demand a change — particularly when the learning or well-being of students is at stake. But such requests can still be autonomy-supportive as long as administrators communicate the reasoning behind them (Jang; Reeve, 2021; Pelletier; Sharp, 2009).

4 Facilitate Mentorship and Collaboration

Novice teachers are typically more self-efficacious when their schools offer many opportunities to learn (Helms-Lorenz; Maulana, 2016). As previously described, administrators can provide such opportunities through high-quality professional development and feedback. But they can also create formal systems within the school to encourage mentorship and collaboration. Both have the potential to provide valuable vicarious experiences for novice teachers. Bandura (1997) described two types of models people can encounter: masterly models, who are highly competent in the field, and coping models, who eventually succeed despite their limited competence. According to Bandura (1997), working with masterly models can help novices develop their skills and knowledge. Coping models, on the other hand, demonstrate that failure is normal and can be overcome.

Mentors – experienced teachers assigned to early career teachers in a school – can serve as masterly models, demonstrating the strategies and self-regulatory processes necessary to succeed. Whereas mentor teachers are a fairly standard part of preservice teachers' experiences, many new teachers begin their jobs without guidance from a formal in-school mentor. Some have described feeling lost without the feedback and support of someone who knows what it takes to be an effective teacher (Shoffner, 2011). On the other hand, novice teachers who experience high-quality mentoring tend to have high self-efficacy (Lazarides *et al.*, 2021).

Much of this can be attributed to skill development. For example, novice teachers report higher self-efficacy after planning lessons or attending professional development with their mentor (Koul *et al.*, 2024; LoCasale-Crouch *et al.*, 2012). Because mentors play an important role in teachers' skill development, those with similar teaching responsibilities tend to be most effective. Novice teachers report feeling better supported when their mentors teach the same grade level (LoCasale-Crouch *et al.*, 2012). Those with mentors in the same subject area are more likely to maintain a strong sense of efficacy and provide better instructional support for their students (Feng *et al.*, 2019; LoCasale-Crouch *et al.*, 2012).

Mentors can also provide guidance that helps mitigate the negative physiological and affective states new teachers may experience. Novice teachers who have assigned mentors report lower levels of distress (Admiraal *et al.*, 2023). In interviews, first-year teachers with access to a mentor have described the importance of an experienced teacher guiding them through problems they have shared (Ma; Chutiyami; Nicoll, 2022). When inexperienced teachers encounter problems, they can find it reassuring to talk to someone who has navigated similar problems in the past (Iaochite; Costa Filho, 2016).

Novices can also benefit from working with people who may not have the well-developed expertise of an assigned mentor. When teachers begin their careers, they often do so without the low-stakes observations and opportunities to collaborate they were built into their teacher education programs. Research suggests that novice teachers still need these instructional supports. Novices who report more frequent collaborations with other teachers tend to be more self-efficacious (Chester; Beaudin, 1996; Hatlevik; Hatlevik, 2024). These include opportunities to observe colleagues (De Neve; Devos; Tuytens, 2015). Watching peers succeed or fail in their teaching can provide valuable information about what works and what does not (Naidoo; Naidoo, 2023). Conversations with peers can also serve as a source of emotional and pedagogical support (Mintzes *et al.*, 2013). Novice teachers who have frequent and supportive conversations with colleagues report higher self-efficacy (De Neve; Devos; Tuytens, 2015; Thomas *et al.*, 2020). Self-efficacy beliefs cannot thrive in a vacuum; new teachers benefit most from close networks with formal mechanisms for mentorship and collaboration.

5 A Final Point: The Importance of Context

In any social science, translating research into action requires careful consideration about the context in which it will be applied. The recommendations outlined in this article are no exception. Instead, they function as general suggestions that will only be useful if adapted according to the goals of administrators and the needs of teachers. My late advisor, Frank Pajares, was fond of quoting Aristotle's caution that "It is an easy matter to know the effects of honey, wine, hellebore, cautery, and cutting. But to know how, for whom, and when we should apply these as remedies is no less an undertaking than being a physician" (Book V, 1137a). With this in mind, two points are worthy of emphasis.

The first is that, because teaching involves many kinds of tasks, teaching self-efficacy is not monolithic. The most commonly employed measure in current research divides teachers' self-efficacy beliefs into their beliefs about their capabilities to engage students, manage classroom behavior, and use instructional strategies (Tschannen-Moran; Woolfolk Hoy, 2001). But there are other competencies associated with teaching, and success in different schools can require different sets of competencies. Another consideration is that teachers must develop a sense of efficacy for self-regulation, as when they cope with changes, manage emotions, or choose ethical ways to navigate difficult situations (Morris; Chen, 2023; Skaalvik; Skaalvik, 2007). Those who work with teachers must be intentional about which skills they wish to promote and adjust their approach accordingly.

The second is that teachers' needs vary, and people who work with them must be knowledgeable of, and responsive to, those needs. For example, Pajares (2006) argued that efforts to support self-efficacy should focus more on skill development than verbal encouragement. After all, as Bruner (1973) noted, the goal of such efforts "is not the production of self-confident fools" (p. 65). It is for this reason that skill development is a point of emphasis across all recommended approaches described in this article. But what of situations in which individuals who are competent fail to take stock in their capabilities? Such individuals are at risk of denying themselves opportunities they are skilled enough to pursue (Bandura, 1997). This could be the case for a promising new teacher who finishes the school year plagued with self-doubt. In these situations, social persuasions – such as encouraging feedback from an administrator – can be a powerful way to assure people they are indeed capable (Pajares, 1994). As with all outlined recommendations, deciding which approach to take involves knowledge of

both the research and the individual; knowing “how, for whom, and when” to use them requires the development of authentic and enduring relationships.

References

- ADMIRAAL, W. *et al.* Mind the gap: Early-career teachers’ level of preparedness, professional development, working conditions, and feelings of distress. **Social Psychology of Education**, v. 26, n. 6, p. 1759-1787, dez. 2023.
- ALESSIO, M. A. D’. The effect of microteaching on science teaching self-efficacy beliefs in preservice elementary teachers. **Journal of Science Teacher Education**, v. 29, n. 6, p. 441-467, ago. 2018.
- BANDURA, A. **Self-efficacy: The exercise of control**. New York: Freeman, 1997.
- BANDURA, A. **Social foundations of thought and action: A social cognitive theory**. Englewood Cliffs, NJ: Prentice Hall, 1986.
- BJÖRK, L. *et al.* Beginning teachers’ work satisfaction, self-efficacy and willingness to stay in the profession: a question of job demands-resources balance? **Teachers and Teaching**, v. 25, n. 8, p. 955-971, nov. 2019.
- BRANTLINGER, A. The meritocratic mystique and mathematical mediocrity in hard-to-staff schools: A critique of the best and brightest teacher agenda. **Urban Education**, v. 55, n. 7, p. 1076-1104, set. 2020.
- BRICK, K. *et al.* Tiered neuroscience and mental health professional development in Liberia improves teacher self-efficacy, self-responsibility, and motivation. **Frontiers in Human Neuroscience**, v. 15, p. 664730, maio 2021.
- BRUNER, J. S. **The process of education**. Repr ed. New York: Vintage Books, 1973.
- CARNEY, M. B. *et al.* Statewide mathematics professional development: Teacher knowledge, self-efficacy, and beliefs. **Educational Policy**, v. 30, n. 4, p. 539-572, jun. 2016.
- CAYUPE, J. C. *et al.* Self-efficacy, organizational commitment, workload as predictors of life satisfaction in elementary school teachers: The mediating role of job satisfaction. **Frontiers in Psychology**, v. 14, p. 1066321, maio 2023.
- CHEN, Y.-C.; WU, H.-K.; HSIN, C.-T. Science teaching in kindergartens: Factors associated with teachers’ self-efficacy and outcome expectations for integrating science into teaching. **International Journal of Science Education**, v. 44, n. 7, p. 1045-1066, maio 2022.
- CHESTER, M. D.; BEAUDIN, B. Q. Efficacy beliefs of newly hired teachers in urban schools. **American Educational Research Journal**, v. 33, n. 1, p. 233-257, mar. 1996.

COLLIE, R. J.; SHAPKA, J. D.; PERRY, N. E. School climate and social–emotional learning: Predicting teacher stress, job satisfaction, and teaching efficacy. **Journal of Educational Psychology**, v. 104, n. 4, p. 1189-1204, nov. 2012.

DE NEVE, D.; DEVOS, G.; TUYTENS, M. The importance of job resources and self-efficacy for beginning teachers' professional learning in differentiated instruction. **Teaching and Teacher Education**, v. 47, p. 30-41, abr. 2015.

DIAS-LACY, S. L.; GUIRGUIS, R. V. Challenges for new teachers and ways of coping with them. **Journal of Education and Learning**, v. 6, n. 3, p. 265, maio 2017.

DICKE, T. *et al.* Beginning teachers' efficacy and emotional exhaustion: Latent changes, reciprocity, and the influence of professional knowledge. **Contemporary Educational Psychology**, v. 41, p. 62-72, abr. 2015.

ENDERLE, P. *et al.* Examining the influence of RETs on science teacher beliefs and practice. **Science Education**, v. 98, n. 6, p. 1077-1108, nov. 2014.

FACKLER, S.; MALMBERG, L.-E.; SAMMONS, P. An international perspective on teacher self-efficacy: Personal, structural and environmental factors. **Teaching and Teacher Education**, v. 99, p. 103255, mar. 2021.

FENG, L. *et al.* Discovering the impact of reading coursework and discipline-specific mentorship on first-year teachers' self-efficacy: a latent class analysis. **Annals of Dyslexia**, v. 69, n. 1, p. 80-98, abr. 2019.

GALE, J. *et al.* A mixed methods study of self-efficacy, the sources of self-efficacy, and teaching experience. **Frontiers in Education**, v. 6, p. 750599, set. 2021.

GARDNER, H. **Extraordinary minds**: Portraits of exceptional individuals and an examination of our extraordinariness. New York: Basic books, 1997.

GARDNER, K.; GLASSMEYER, D.; WORTHY, R. Impacts of STEM professional development on teachers' knowledge, self-efficacy, and practice. **Frontiers in Education**, v. 4, p. 26, abr. 2019.

GARRICK, A. *et al.* Non-work time activities predicting teachers' work-related fatigue and engagement: an effort-recovery approach. **Australian Psychologist**, v. 53, n. 3, p. 243-252, jun. 2018.

GARRISON-WILHELM, A.; WOODS, D.; KARA, Y. Supporting change in novice alternative certification teachers' efficacy. **Psychology in the Schools**, v. 58, n. 10, p. 1902-1918, out. 2021.

GIALLO, R.; LITTLE, E. Classroom behaviour problems: The relationship between preparedness, classroom experiences, and self-efficacy in graduate and student teachers. **Australian journal of educational & developmental psychology**, v. 3, n. 2003, p. 21-34, 2003.

GÜMÜŞ, E.; BELLİBAŞ, M. Ş. The relationship between the types of professional development activities teachers participate in and their self-efficacy: a multi-country analysis. **European Journal of Teacher Education**, v. 46, n. 1, p. 67-94, 1 jan. 2023.

HAN, X. Associations between the helpfulness of teacher induction programs, teacher self-efficacy, and anticipated first-year teacher retention. **Frontiers in Psychology**, v. 14, p. 1088111, fev. 2023.

HATLEVIK, I. K. R.; HATLEVIK, O. E. Variations in sources of job satisfaction and teacher efficacy between novice and experienced teachers. **Teachers and Teaching**, p. 1-20, set. 2024.

HATTIE, J.; TIMPERLEY, H. The power of feedback. **Review of Educational Research**, v. 77, n. 1, p. 81-112, mar. 2007.

HELMS-LORENZ, M. *et al.* Beginning teachers' self-efficacy and stress and the supposed effects of induction arrangements. **Educational Studies**, v. 38, n. 2, p. 189-207, maio 2012.

HELMS-LORENZ, M.; MAULANA, R. Influencing the psychological well-being of beginning teachers across three years of teaching: Self-efficacy, stress causes, job tension and job discontent. **Educational Psychology**, v. 36, n. 3, p. 569-594, mar. 2016.

IAOCHITE, R. T.; COSTA FILHO, R. A. da. Teacher efficacy beliefs during the practicum experiences in physical education classes. **Motriz: Revista de Educação Física**, v. 22, n. 3, p. 183-189, set. 2016.

JANG, H.-R.; REEVE, J. Intrinsic instructional goal adoption increases autonomy-supportive teaching: A randomized control trial and intervention. **Learning and Instruction**, v. 73, p. 101415, jun. 2021.

KLASSEN, R. M.; DURKSEN, T. L. Weekly self-efficacy and work stress during the teaching practicum: A mixed methods study. **Learning and Instruction**, v. 33, p. 158-169, out. 2014.

KLASSEN, R. M.; TZE, V. M. C. Teachers' self-efficacy, personality, and teaching effectiveness: A meta-analysis. **Educational Research Review**, v. 12, p. 59-76, jun. 2014.

KLEICKMANN, T. *et al.* The effects of expert scaffolding in elementary science professional development on teachers' beliefs and motivations, instructional practices, and student achievement. **Journal of Educational Psychology**, v. 108, n. 1, p. 21-42, jan. 2016.

KNOBLOCH, N. A. Exploring relationships of teachers' sense of efficacy in two student teaching programs. **Journal of Agricultural Education**, v. 47, n. 2, p. 36-47, jun. 2006.

KOUL, R. *et al.* Mentoring in the development of science teaching self-efficacy among primary school teachers in Thailand: A mixed methods study. **Journal of Science Teacher Education**, v. 35, n. 1, p. 44-62, jan. 2024.

LAZARIDES, R. *et al.* Teacher self-efficacy and enthusiasm: Relations to changes in student-perceived teaching quality at the beginning of secondary education. **Learning and Instruction**, v. 73, p. 101435, jun. 2021.

- LOCASALE-CROUCH, J. *et al.* The role of the mentor in supporting new teachers: Associations with self-efficacy, reflection, and quality. **Mentoring & Tutoring: Partnership in Learning**, v. 20, n. 3, p. 303-323, ago. 2012.
- MA, K.; CHUTTIYAMI, M.; NICOLL, S. Transitioning into the first year of teaching: Changes and sources of teacher self-efficacy. **The Australian Educational Researcher**, v. 49, n. 5, p. 943-960, nov. 2022.
- MCCANN, T. M.; JOHANNESSEN, L. R. Why do new teachers cry? **The Clearing House: A Journal of Educational Strategies, Issues and Ideas**, v. 77, n. 4, p. 138-145, mar. 2004.
- MINTZES, J. J. *et al.* Enhancing self-efficacy in elementary science teaching with professional learning communities. **Journal of Science Teacher Education**, v. 24, n. 7, p. 1201-1218, nov. 2013.
- MISHRA, P.; KOEHLER, M. J. Technological pedagogical content knowledge: a framework for teacher knowledge. **Teachers College Record**, v. 108, n. 6, p. 1017-1054, jun. 2006.
- MORRIS, D. B.; CHEN, J. A. A social cognitive perspective of educators' moral agency. **Theory Into Practice**, v. 62, n. 3, p. 306-317, 3 jul. 2023.
- MORRIS, D. B.; USHER, E. L. Developing teaching self-efficacy in research institutions: A study of award-winning professors. **Contemporary Educational Psychology**, v. 36, n. 3, p. 232-245, jul. 2011.
- MORRIS, D. B.; USHER, E. L.; CHEN, J. A. Reconceptualizing the Sources of Teaching Self-Efficacy: a Critical Review of Emerging Literature. **Educational Psychology Review**, v. 29, n. 4, p. 795-833, dez. 2017.
- MULHOLLAND, J.; DORMAN, J. P.; ODGERS, B. M. Assessment of science teaching efficacy of preservice teachers in an Australian university. **Journal of Science Teacher Education**, v. 15, n. 4, p. 313-331, nov. 2004.
- NAIDOO, K.; NAIDOO, L. J. Designing teaching and reflection experiences to develop candidates' science teaching self-efficacy. **Research in Science & Technological Education**, v. 41, n. 1, p. 211-231, jan. 2023.
- OZTURK, N.; YILMAZ-TUZUN, O. Knowledge and risk-benefit perception as predictors of preservice science teachers' self-efficacy beliefs for socioscientific issues-based instruction. **Canadian Journal of Science, Mathematics and Technology Education**, v. 22, n. 4, p. 915-930, dez. 2022.
- PAJARES, F. Inviting self-efficacy: The role of invitations in the development of confidence and competence in writing. **Journal of Invitational Theory and Practice**, v. 3, p. 13-24, 1994.
- PAJARES, F. Self-efficacy during childhood and adolescence: Implications for teachers and parents. In: PAJARES, F.; URDAN, T. (ed.). **Self-Efficacy Beliefs of Adolescents**. Greenwich, CT: Information Age Publishing, 2006. p. 117-137.

PALERMO, M.; KELLY, A. M.; KRAKEHL, R. Physics teacher retention, migration, and attrition. **Journal of Science Teacher Education**, v. 33, n. 4, p. 368-391, maio 2022.

PELLETIER, L. G.; SHARP, E. C. Administrative pressures and teachers' interpersonal behaviour in the classroom. **Theory and Research in Education**, v. 7, n. 2, p. 174-183, jul. 2009.

RAUDENBUSH, S. W.; ROWAN, B.; CHEONG, Y. F. Contextual effects on the self-perceived efficacy of high school teachers. **Sociology of Education**, v. 65, n. 2, p. 150, abr. 1992.

ROSS, J. A. *et al.* Administrative assignment of teachers in restructuring secondary schools: the effect of out-of-field course responsibility on teacher efficacy. **Educational Administration Quarterly**, v. 35, n. 5, p. 782-805, dez. 1999.

ROSS, J. A.; BRADLEY COUSINS, J.; GADALLA, T. Within-teacher predictors of teacher efficacy. **Teaching and Teacher Education**, v. 12, n. 4, p. 385-400, jul. 1996.

RYAN, R. M.; DECI, E. L. (ed.). **Self-determination theory: Basic psychological needs in motivation, development, and wellness**. [s.l.] Guilford Press, 2017.

SCHWARZHAUPT, R. *et al.* Teachers' engagement and self-efficacy in a PK-12 computer science teacher virtual community of practice. **Journal of Computer Science Integration**, v. 4, n. 1, p. 1, out. 2021.

SEIDEL, T. *et al.* Student characteristics in the eyes of teachers: differences between novice and expert teachers in judgment accuracy, observed behavioral cues, and gaze. **Educational Psychology Review**, v. 33, n. 1, p. 69-89, mar. 2021.

SHOFFNER, M. Considering the first year: Reflection as a means to address beginning teachers' concerns. **Teachers and Teaching**, v. 17, n. 4, p. 417-433, ago. 2011.

SKAALVIK, E. M.; SKAALVIK, S. Dimensions of teacher self-efficacy and relations with strain factors, perceived collective teacher efficacy, and teacher burnout. **Journal of Educational Psychology**, v. 99, n. 3, p. 611-625, 2007.

SORENSEN, L. C.; LADD, H. F. The hidden costs of teacher turnover. **AERA Open**, v. 6, n. 1, p. 233285842090581, jan. 2020.

SWACKHAMER, L. E. *et al.* Increasing the self-efficacy of inservice teacher through content knowledge. **Teacher Education Quarterly**, v. 36, p. 63-78, 2009.

TEIG, N.; SCHERER, R.; NILSEN, T. I know I can, but do I have the time? The role of teachers' self-efficacy and perceived time constraints in implementing cognitive-activation strategies in science. **Frontiers in Psychology**, v. 10, p. 1697, ago. 2019.

THOMAS, L. *et al.* Transformational school leadership as a key factor for teachers' job attitudes during their first year in the profession. **Educational Management Administration & Leadership**, v. 48, n. 1, p. 106-132, jan. 2020.

THOMSON, M. M. *et al.* Developmental trajectories for novice teachers: Teaching efficacy, instructional beliefs, and domain knowledge. **International Journal of Science Education**, v. 44, n. 8, p. 1277-1298, maio 2022.

THOMSON, M. M.; HUGGINS, E.; WILLIAMS, W. Developmental science efficacy trajectories of novice teachers from a STEM-Focused program: A longitudinal mixed-methods investigation. **Teaching and Teacher Education**, v. 77, p. 253-265, jan. 2019.

TSCHANNEN-MORAN, M.; HOY, A. W.; HOY, W. K. Teacher efficacy: Its meaning and measure. **Review of Educational Research**, v. 68, n. 2, p. 202-248, jan. 1998.

TSCHANNEN-MORAN, M.; MCMASTER, P. Sources of self-efficacy: Four professional development formats and their relationship to self-efficacy and implementation of a new teaching strategy. **The Elementary School Journal**, v. 110, n. 2, p. 228-245, dez. 2009.

TSCHANNEN-MORAN, M.; WOOLFOLK HOY, A. Teacher efficacy: Capturing an elusive construct. **Teaching and Teacher Education**, v. 17, n. 7, p. 783-805, out. 2001.

TSCHANNEN-MORAN, M.; WOOLFOLK HOY, A. The differential antecedents of self-efficacy beliefs of novice and experienced teachers. **Teaching and Teacher Education**, v. 23, n. 6, p. 944-956, ago. 2007.

VELTHUIS, C.; FISSER, P.; PIETERS, J. Teacher training and pre-service primary teachers' self-efficacy for science teaching. **Journal of Science Teacher Education**, v. 25, n. 4, p. 445-464, maio 2014.

WISNIEWSKI, B.; ZIERER, K.; HATTIE, J. The power of feedback revisited: a meta-analysis of educational feedback research. **Frontiers in Psychology**, v. 10, p. 3087, jan. 2020.

WOLF, K. J.; FOSTER, D. D.; BIRKENHOLZ, R. J. The relationship between teacher self-efficacy and the professional development experiences of agricultural education teachers candidates. **Journal of Agricultural Education**, v. 51, n. 4, p. 38-48, dez. 2010.

WOOLFOLK HOY, A.; BURKE-SPERO, R. Changes in teacher efficacy during the early years of teaching: A comparison of four measures. **Teaching and Teacher Education**, v. 21, n. 4, p. 343-356, maio 2005.

YILDIZ DURAK, H. *et al.* Examining the predictors of TPACK for integrated STEM: Science teaching self-efficacy, computational thinking, and design thinking. **Education and Information Technologies**, v. 28, n. 7, p. 7927-7954, jul. 2023.

ZEE, M.; KOOMEN, H. M. Y. Teacher self-efficacy and its effects on classroom processes, student academic adjustment, and teacher well-being: A synthesis of 40 years of research. **Review of Educational Research**, v. 86, n. 4, p. 981-1015, jan. 2016.

ZENG, Y.; WANG, Y.; LI, S. The relationship between teachers' information technology integration self-efficacy and TPACK: A meta-analysis. **Frontiers in Psychology**, v. 13, p. 1091017, dez. 2022.

MORRIS, D. B.

ZHOU, X. *et al.* The effect of professional development on in-service STEM teachers' self-efficacy: a meta-analysis of experimental studies. **International Journal of STEM Education**, v. 10, n. 1, p. 37, maio 2023.

Enviado em: 21/01/2025

Revisado em: 22/05/2025

Aprovado em: 23/05/2025