"I have never done that before, so I will probably succeed": higher education students' self-efficacy after the COVID-19 pandemic

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Introduction: The COVID-19 pandemic led to the cancellation of traditional exams for Norwegian upper secondary schools, resulting in the "COVID-19 cohort" graduating with little or no exam experience. This study explores how this impacted their self-efficacy upon entering higher education. Guided by Bandura's social cognitive theory, it identifies mastery experiences, modeling behaviors, verbal persuasion, and physiological states as key predictors.

Methods: To explore this, we conducted a survey among first- to third-year students ($n = 248$) at a Norwegian university in autumn 2022.

Results: Students emphasized "prior experiences" and "teacher feedback" as vital for self-efficacy, though many reported receiving limited feedback. Interestingly, despite lacking exam experience-a central predictor of self-efficacy-students largely felt unaffected by this.

Discussion: The pandemic's impact may not necessitate significant curriculum adjustments in higher education. However, some students believed easier coursework would enhance self-efficacy, a view inconsistent with self-efficacy theory, which underscores the value of challenging, resilience-building experiences.

KEYWORDS

higher education, exam, post-pandemic, self-efficacy, mixed-methods, COVID-19

1 Introduction

In March 2020, Norway implemented nationwide shutdowns to limit the spread of COVID-19. By February 2022, the government had canceled high school exams for a third consecutive year due to the pandemic. Minister of Education Tonje Brenna cited school capacity issues, challenges in planning the remainder of the school year, and disparities in educational quality as the primary reasons (Aas, 2022). However, the decision sparked criticism, with former Minister of Education Jan Tore Sanner expressing concerns about its impact on students transitioning to higher education: "For many, it can be a challenging starting point" (Aas, 2022). Media coverage, including a July 2022 article in *Aftenposten*, noted that this "COVID-19 cohort" faced unique challenges, having completed much of high school under exceptional circumstances (Hageberg, 2022). Additionally, Kristin Vinje, Director of the National Agency for Quality in Education, highlighted survey data revealing that 60% of high school students felt unprepared for essential skills such as critical thinking, practical knowledge, and text comprehension—skills central to succeeding in higher education (Pettersen, 2017).

This study addresses these pedagogical concerns by examining the self-reported feelings of academic preparedness among post-pandemic students—defined as students in higher education after restrictions were lifted in August 2022. It contributes to the growing body of literature on the educational impacts of COVID-19 (e.g., Breiby et al., 2022; Vee et al., 2022). Factors influencing students' success in higher education include demographic variables (e.g., age, gender, ethnicity, nationality), prior academic performance, the difficulty and duration of educational programs (Saa et al., 2019), intellectual development, and the degree of integration with their institution (Jama et al., 2008). This study focuses specifically on the "COVID-19 cohort"—students entering higher education with little or no prior exam experience—by exploring their self-efficacy related to academic and exam performance. The emphasis on self-efficacy is grounded in the assumption that beliefs about one's capabilities are shaped by societal narratives about this cohort's "challenging starting point," as outlined above. Furthermore, prior research underscores the significance of self-efficacy in shaping academic motivation and performance (Duckworth and Quinn, 2009; Dweck, 2006; Manger and Wormnes, 2015).

Self-efficacy, first conceptualized by Bandura (1977), refers to individuals' perceptions of their ability to manage specific tasks or situations. Unlike academic self-concept, which encompasses general perceptions of one's abilities (Bong and Skaalvik, 2003; Skaalvik and Skaalvik, 2015), self-efficacy is task-specific and context-dependent. It is a critical determinant of behavior, motivation, and persistence in challenging situations (Arnold et al., 2005). In educational contexts, higher self-efficacy correlates with greater effort, perseverance, and psychological resilience, all of which contribute to improved academic performance (Bandura, 1997; Cassidy, 2015; Schunk, 1991). Conversely, low self-efficacy can lead to feelings of helplessness and failure, thereby hindering academic achievement.

Bandura (1997) identified four primary sources of self-efficacy: mastery experiences, social modeling, verbal persuasion, and physiological states. Mastery experiences—the most influential source—stem from successfully completing challenging tasks through effort and perseverance. These successes reinforce the belief in one's ability to tackle future challenges. Conversely, repeated failures can significantly undermine self-efficacy, particularly in individuals with limited prior experience. Social modeling involves observing the success of peers and serves as an indirect means of building self-efficacy. However, this source is generally less robust, as it does not originate from personal experience. Verbal persuasion—such as positive feedback from instructors—can enhance self-efficacy when the feedback is credible and delivered by trusted individuals. Finally, physiological and emotional states, such as stress and anxiety, can either bolster or weaken self-efficacy, depending on how these states are interpreted (Pajares, 1997).

The COVID-19 pandemic disrupted traditional educational experiences, depriving the COVID-19 cohort of sufficient opportunities to develop mastery experiences through exams. Under normal circumstances, students in Norwegian high schools enrolled in the Programme for General Studies take five or six exams over the course of their three-year program. Of these, at least three are written and at least one is oral. Approximately 20% of students are selected to take an oral or written exam in their first year, and all students are required to take at least one oral or written exam in their second year. The remaining four exams are administered at the end of the third year: three written exams (the two forms of Norwegian and one randomly selected programme subject) and one oral exam (either a mandatory or programme subject, also randomly selected). Due to exam cancellations from 2020 to 2022, students who graduated in 2022 did not take any high school exams. Among those who graduated in 2021, approximately one in five took an exam in their first year. Students who graduated in 2020 typically had one exam, with some taking two.

The written exams are developed by the Norwegian Directorate for Education and Training and are therefore standardized across the country. In contrast, oral exams are planned and administered by local schools. Students must pass all high school exams to receive a general university and college admissions certification, which is required for entry into higher education. While there are notable differences between high school and higher education exams, we consider them to be similar in important ways. In both contexts, exams serve as assessments of students' competencies in specific subjects, determine achievement through grading, and require skills related to learning, stress management, and written or oral communication. As such, we view high school exams as opportunities for students to develop mastery experiences relevant to exams in higher education. Based on Bandura's (1997) theory of self-efficacy, there is reason to believe that the COVID-19 cohort—particularly those who completed high school in 2022—had fewer opportunities to develop mastery experiences and may therefore exhibit lower self-efficacy related to exams in higher education.

High school students during this period also encountered limited opportunities for social modeling, as peer interactions were restricted during lockdowns. Findings from the *Students' Health and Wellbeing Study* indicate that the pandemic exacerbated mental health challenges among students, with one in five reporting mental health disorders and only 40% reporting a good quality of life (Sivertsen and Johansen, 2022). These findings suggest that the fourth source of self-efficacy—physiological and emotional states—may have been negatively affected among post-pandemic students.

Despite these challenges, the cognitive evaluation process described by Bandura (1986) emphasizes that self-efficacy is not fixed, but rather the result of ongoing reflection. Students assess their efficacy by weighing personal characteristics, situational factors, task difficulty, and external support. Understanding how the COVID-19 cohort evaluates these factors is essential for identifying their preparedness for higher education and addressing potential barriers to success.

This study investigates the self-efficacy of post-pandemic students, particularly the COVID-19 cohort, in relation to exams and academic performance. The central research question is: To what extent do post-pandemic students experience self-efficacy related to exams, and what factors do they believe enhance their self-efficacy? Data were collected in the fall of 2022, the first semester after COVID-19 restrictions were lifted. In addition to the COVID-19 cohort, second- and third-year bachelor's students were surveyed to compare differences across groups. While all students in our sample had less-than-typical exam experiences and

TABLE 1 Number of participants by study and academic year.

Study	Academic year			Total
	1	2	3	
Economics and administration	0	1	5	6
Organization and management	15	9	11	35
Psychology	49	39	34	122
Tourism	13	5	9	27
Social work	22	17	19	58
Total	99	71	78	248

limited opportunities for social modeling, first-year students stood out as particularly affected. In contrast to second- and third-year students—who had at least some experience with digital exams in higher education—first-year students entered university with little to no such experience, as high school exams had been canceled during the pandemic, whereas higher education exams continued in modified formats. Using a mixed-methods approach, the survey combined quantitative measures with qualitative insights to provide a comprehensive understanding of students' perceptions (Johnson and Onwuegbuzie, 2004).

2 Materials and methods

2.1 Sample and recruitment

The survey was conducted among students at [BLINDED] during the fall of 2022. Participants included bachelor's students from the psychology, tourism, economics and administration, organization and management, and social work programs (see Table 1). Including students from a range of academic fields strengthens the study by capturing a broader cross-section of the student population. By collecting data across different years of study, we were able to examine whether students' responses varied based on their prior exam experience. Data collection was carried out digitally using the survey platform Nettskjema.no and was primarily distributed via the digital learning platform Canvas. Students were informed about the survey and encouraged to participate during several classes, including Social Science Methodology; Knowledge and Dissemination; Introduction to Social Work; Areas of Work and Methods in Social Work; Complexity and Critical Perspectives in Social Work; Introduction to Tourism; Digital Marketing; Destination Management; Experience and Event Management; Personality Psychology; Advanced Research Methods; and Social Psychology. In some cases, instructors allocated time during class to facilitate student participation. The survey was open for participation from October 17 to October 29, 2022—approximately midway through the autumn semester—at a time when students were actively engaged in mandatory coursework and had received feedback on their work but had not yet undertaken any formal examinations.

The gross sample consisted of 1,329 students, of whom 248 (~19%) responded to the survey (ages 18–52; $M = 23.5$ years; $n = 196$ identified as female, $n = 52$ identified as male). Approximately half of the respondents ($n = 125$) completed high school prior to

the COVID-19 pandemic ($n = 91$ before 2019, $n = 34$ in 2019). The remaining half ($n = 123$) finished high school during the pandemic ($n = 51$ in 2020, $n = 42$ in 2021, $n = 30$ in 2022). Most respondents were recruited from the psychology program (see Table 1).

2.2 Variables

The following variables were based on Bandura's (1997) four sources of self-efficacy, with adaptations to suit the current context: (i) Positive beliefs and outlooks on mastery, rooted in past experiences, were captured by the variables *Confidence in study success* and *Confidence in exam success*. Similar contextual adaptations have been applied in previous studies in the Norwegian higher education context (Slåtten et al., 2023). (ii) Social modeling, defined as the student's perceived ability to succeed based on social comparison, was measured using the variable *Expected influence of peers on student self-efficacy*. (iii) Verbal persuasion was assessed through the variables *Expected influence of teacher feedback on student self-efficacy* and *Experienced teacher feedback frequency*, which reflect the extent to which feedback from credible sources can enhance students' beliefs in their capabilities. (iv) The variable *Expected influence of the pandemic on student self-efficacy* captured students' general emotional responses to the pandemic—both positive and negative—as a proxy for potential stress or anxiety in academic and exam settings. The items were designed to assess students' general, yet temporally specific, academic self-efficacy and experiences, rather than those tied to individual courses. Full details of the items corresponding to these variables are presented below, along with an item asking students to rank the four sources of self-efficacy and an open-ended question inviting further elaboration.

2.1.1 Confidence in study success

Confidence in study success were measured using two items: "I have a positive expectation of succeeding in my studies" and "I am confident in my abilities to succeed in my studies this semester." Responses were recorded on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The two items were significantly correlated ($r = 0.50$, $p < 0.001$) and were averaged to create a composite score.

2.1.2 Confidence in exam success

Confidence in exam success were measured using two items: "I am confident in my ability to succeed in the exams this semester" and "I believe I will achieve good results in the exams this semester." Responses were recorded on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The two items were significantly correlated ($r = 0.74$, $p < 0.001$) and were averaged to create a composite score.

2.1.3 Expected influence of peers on students' self-efficacy

The influence of fellow students on self-efficacy was assessed with two items: "When I see others succeed in their performance (e.g., work requirements), I experience an increased belief that I will succeed in the exams" and "When I see a fellow student I identify

with succeeding in their performance (e.g., work requirements), I experience an increased belief that I will succeed in the exams." Responses were recorded on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The two items were significantly correlated ($r = 0.66$, $p < 0.001$) and were averaged to create a composite score.

2.1.4 Expected influence of teacher feedback on students' self-efficacy

Expected teachers' influence on students' self-efficacy was measured using two items: "When teachers provide me with encouraging feedback, I gain more confidence in my own skills" and "Positive feedback on my performance (e.g., work requirements) from teachers will give me increased confidence that I can succeed in the exams." Responses were recorded on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The two items were significantly correlated ($r = 0.32$, $p < 0.001$) and were averaged to create a composite score.

2.1.5 Experienced teacher feedback frequency

Feedback from teachers was measured using a single item: "The teachers in the study often give me encouraging feedback." Responses were recorded on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

2.1.6 Expected influence of the pandemic on students' self-efficacy

The perceived influence of the pandemic on self-efficacy was measured using two items: "I believe the pandemic has affected my chances of succeeding in my studies" and "I believe the pandemic has affected my chances of succeeding in the exams this semester." Responses were recorded on a 5-point Likert scale ranging from 1 (*very negative*) to 5 (*very positive*). The two items were significantly correlated ($r = 0.47$, $p < 0.001$) and were averaged to create a composite score.

2.1.7 Factors expected to impact students' study success

Participants were asked to select which of the four sources—others' performance, previous experience, encouragement from others, or physical and mental states—they believed most influenced their study success.

Finally, an open-ended exploratory question was included: "Is there anything you believe is important for your belief in succeeding in your studies that we have not mentioned above?" Students provided qualitative responses to this item.

2.2 Ethical considerations

Three main ethical considerations are particularly important in this study: (1) the informants' right to self-determination and autonomy, (2) the researcher's duty to respect the informants' privacy, and (3) the researcher's responsibility to avoid harm (Johannessen et al., 2010). To uphold the informants' right to

TABLE 2 Descriptive statistics by academic year.

Variables	Academic year		
	1	2	3
	M (SD)	*M (SD)*	*M (SD)*
Confidence in study success	3.88 (0.85)	3.99 (0.87)	3.94 (0.96)
Confidence in exam success	3.47 (0.87)	3.48 (1.03)	3.68 (1.04)
Teacher influence on SE	3.27 (1.00)	3.04 (1.08)	2.97 (0.92)
Teacher feedback	4.37 (0.62)	4.15 (0.82)	4.21 (0.68)
Peer influence on SE	3.41 (0.89)	3.13 (1.06)	3.24 (0.93)
Pandemic influence on SE	2.89 (0.67)	3.05 (0.63)	3.03 (0.63)

SE, Self-efficacy.

self-determination and autonomy, students were informed that participation in the study was voluntary. Additionally, it was explicitly communicated that the survey was anonymous and that no data could be traced back to individual respondents.

To address the researcher's duty to respect informants' privacy, only one reminder to complete the survey was sent. The survey did not collect medical data or address particularly sensitive or vulnerable topics. Nevertheless, careful consideration was given to the wording of certain questions to ensure that the researcher's responsibility to avoid harm was upheld to the fullest extent.

The study collected anonymous data of a non-sensitive nature and was therefore not required to be reported to the Norwegian Agency for Shared Services in Education and Research (Sikt, 2023). However, respondents were given the opportunity to participate in a gift card draw. To maintain participants' privacy and anonymity, email addresses for the draw were collected through a separate online form, unlinked to their survey responses.

2.3 Analytical strategy

The quantitative data were analyzed using R Statistical Software (version 4.1.1.1; R Core Team, 2021). We examined whether self-efficacy and its sources varied significantly across academic years using analysis of variance (ANOVA), conducted via the aov() function in base R. Descriptive statistics are presented in Table 2.

Qualitative responses were analyzed using Giorgi's (2012) descriptive phenomenological psychological method. This approach aims to explore a given phenomenon as it is subjectively and consciously experienced, making explicit the psychological value of what the students describe as particularly important to them. The students' free-text answers were analyzed using Giorgi's five-stage analytical procedure (see Table 3):

1. **Reading the dataset**—The entire dataset is read to gain an initial holistic impression.
2. **Identifying "meaning units"**—Upon rereading, the researcher marks the text in parts where she notices a transition in meaning—a shift in perspective—caused by changes in descriptions in the data. These are differences in how students describe themselves in the world (their lifeworld) in relation to the phenomenon under study (self-efficacy). Places of transition of meaning in the dataset are marked as "constituting parts."

TABLE 3 Results from the qualitative analysis.

Quotes: Informants' expressions of lifeworld	Meaning units	Descriptive psychological value	Theoretical interpretation
"Being able to follow up on my own strategies to be prepared for exams." *"I have developed better working habits as a result of the pandemic"*	Self as having something which enables	Experiences from one's own work habits and work strategies which have proven successful.	Self-efficacy from previous experiences (**Bandura source 1**)
"Experience—difficult to know what is expected and where the threshold is before the first exam. I think it will get better on subsequent exams." *"Due to corona, I have never had an exam since everything was canceled, so I don't know what to expect and have no idea what the examiner expects in an exam."*	Self as lacking of something	Insecurities over the nature and level of difficulty of exams due to lack of experience.	Self-efficacy from previous experiences (**Bandura source 1**)
"Leadership experience from the military"	Self as having something which enables	Positive experiences of achievement outside of studies.	Self-efficacy from previous experiences (**Bandura source 1**)
"General and rough statistical comparison with other students"	Self reflected in another (peers)	To observe and compare one's own achievements to that of fellow students.	Self-efficacy through comparison to fellow students (**Bandura source 2**)
"Easier to succeed when you have a good environment around you, something I have on this course:-)" *"Encourage one another."* *"Sense of belonging to the study program and the study environment is important."* *"Pleasant gatherings with fellow students that increase a sense of community—for example, by being able to express what is difficult about the studies and feeling less alone about difficult parts of the curriculum."*	Self as part of a greater "we"	Support from other students and taking part in social activities offers encouragement, community, and sense of belonging.	Self-efficacy through social support from peers and sense of belonging (**not Bandura source**)
"That my parents believe in me."	Self as reflected in another (parents)	Support from parents understood as encouragement, attention, and recognition.	Self-efficacy through recognition from family (**not Bandura source**)
"That the course leader is structured and engaging. This has been partly poor this semester." *"Better follow-up and encouragement from lecturers and course leaders."*	Self reflected in another (teachers)	Support from teachers understood as general encouragement, attention, and recognition.	Self-efficacy through recognition and support from teachers (**Bandura source 3**)
"Knowing what the exam might be like, for example, accessing previous exam questions and knowing what is expected in answers, or knowing what will be emphasized in the exam." *"Too many foreign words, foreign languages, and abbreviations make me fall behind more quickly in class."* *"It's unfair that my memory is being tested like that."*	Self as in need of help	Support from teachers understood as guidance toward exams and to make student tasks easier.	Self-efficacy through support from teachers (**Bandura source 3**)
"… IMPORTANT: Being able to choose whether to participate physically or virtually in lectures. The Corona time showed that it works excellently for many of us and makes everyday life EASIER…" *"Possibility to record lectures, which allows you to watch them later if lectures clash with work/other things."*	Self as expectant of services	The role of teacher understood as facilitator of hybrid and varied (physical and digital) educational services.	Self-efficacy through support from teachers (**Bandura source 3**)
"Having fun outside of my studies also helps me get out of any negative thought patterns, and I generally have more energy." *"Keep up your motivation and remember to take breaks to avoid burn-out."*	Self as self-regulating	Self-awareness of inner psychological states and how it is possible to influence these states.	Self-efficacy based on personal states and resources (**Bandura source 4**)
"It does not feel like I have a choice. It's almost survival, and to avoid hopelessness in doing absolutely nothing in everyday life. Then you choose to do something you don't feel you can master, with a small hope that it will later give you meaning and hope."	Self in pain	Self-awareness of trying to study despite being in a painful psychological state.	Self-efficacy based on personal states and resources (**Bandura source 4**)
"Getting used to being exposed to exam stress. Rather go through a difficult learning process to learn properly, than to make it easy."	Self as able to handle obstacles	Belief in one's own ability and resilience when faced with challenges.	Self-efficacy based on personal states and resources (**Bandura source 4**)

These are "correlated with the attitude of the researcher" (Giorgi, 2012, p. 5), and may therefore vary. During this analysis, three of the authors worked together to ensure intersubjectivity in each step of the analytical process. For the sake of transparency, the complete dataset has been made available on OSF: https://osf.io/fmbhq/?view_only=2772d8154896429aa280f59601a08305.

3. **Describing psychological value**—Participants' expressions of their lifeworld are described, largely using their own words,
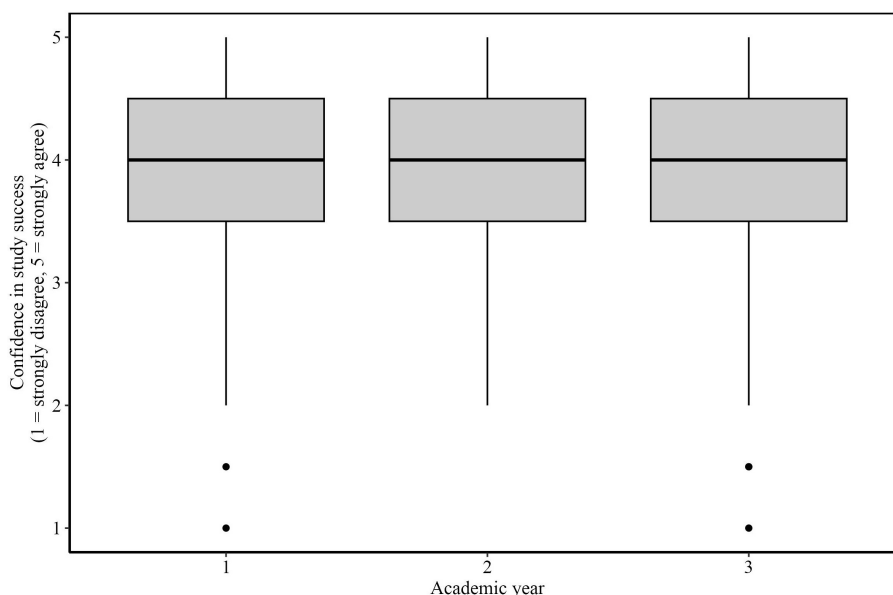
FIGURE 1
Confidence in study success across academic years. Confidence in study success was measured using two items: "I have a positive expectation of succeeding in my studies" and "I am confident in my abilities to succeed in my studies this semester." Boxplots display medians, interquartile ranges, and outliers.

in a way that makes the psychological value of their experiences explicit. This is done with minimal interpretation by the researcher.

4. **Identifying an essential structure**—The more sensitive expressions of the students are reviewed. Together with the psychological descriptions, these identify an essential structure of the experience. Table 3 is presented based on this structure, showing the variations in subjective experience and how these variations interrelate.

5. **Interpreting the data through theory**—The essential structure is used to interpret the data within relevant theoretical frameworks.

3 Results

A one-way ANOVA revealed no significant differences in students' beliefs about succeeding in their studies between first-, second-, and third-year undergraduate students, $F_{(2,245)} = 0.31$, $p = 0.734$, 95% CI [0.00, 0.04] (see Figure 1). Additionally, although first-year students appeared to have lower expectations of success in exams compared to second- and third-year students, a one-way ANOVA indicated that this difference was not statistically significant, $F_{(2,245)} = 1.16$, $p = 0.315$, 95% CI [0.00, 0.04] (see Figure 2).

Another one-way ANOVA showed that students across all academic years reported similar levels of perceived influence of their fellow students' performance on their self-efficacy, $F_{(2,245)} = 1.81$, $p = 0.165$, 95% CI [0.00, 0.05] (see Figure 3).

Qualitative responses revealed that students perceived companionship and support from peers as important sources of self-efficacy. While only one student explicitly expressed a desire to compare their performance with that of their peers, several students stressed the importance of encouragement from peers, a sense of community, and a sense of belonging to their student environment. Table 3 provides quotes which are representative of various student responses, and illustrates how their experiences have been analyzed following Giorgi (2012).

Students across all three academic years reported that teacher feedback significantly influenced their self-efficacy. A one-way ANOVA indicated that this perception did not differ significantly between academic years, $F_{(2,245)} = 2.31$, $p = 0.101$, 95% CI [0.00, 1.00] (see Figure 4). However, the majority of students selected "neither agree nor disagree" when asked whether they often receive encouraging feedback from teachers (see Figure 5). These findings suggest that while students expect teacher feedback to positively influence their self-efficacy, they do not perceive such feedback as frequent.

Qualitative responses further support this interpretation, as students emphasized the importance of teacher feedback in fostering self-efficacy. They expressed a desire for more guidance and support, and for teachers to adopt a more engaging and motivating approach (see Table 3). While some students requested specific guidance to help them prepare for exams, others—particularly those in the post-COVID cohort—suggested that effective teacher support could include offering hybrid (digital and physical) lecture formats. These findings illustrate that teacher feedback can take different forms depending on students' educational needs, and that students' perceptions of the university teacher's role may have shifted as a result of their experiences during the pandemic.

Surprisingly, most students reported that the COVID-19 pandemic had little or no impact on their self-efficacy (see Figure 6). A one-way ANOVA also revealed no significant differences in perceived pandemic effects across academic years, $F_{(2,243)} = 1.52$, $p = 0.221$, 95% CI [0.01, 0.11].
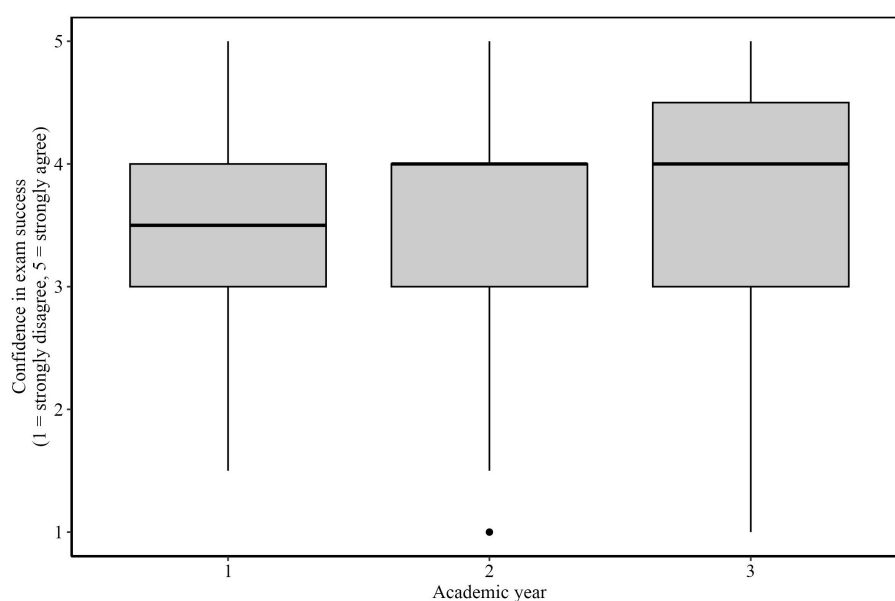
FIGURE 2
Confidence in exam success across academic years. Confidence in exam success was measured using two items: "I am confident in my ability to succeed in the exams this semester" and "I believe I will achieve good results in the exams this semester." Boxplots display medians, interquartile ranges, and outliers.
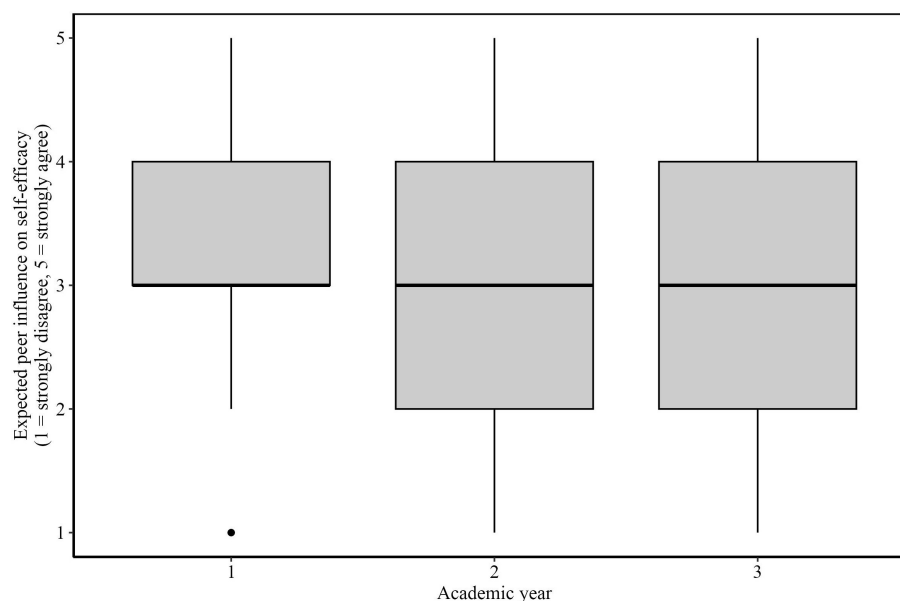

FIGURE 3
Expected influence of peers on students' self-efficacy across academic years. The expected influence of fellow students on self-efficacy was assessed with two items: "When I see others succeed in their performance (e.g., work requirements), I experience an increased belief that I will succeed in the exams" and "When I see a fellow student I identify with succeeding in their performance (e.g., work requirements), I experience an increased belief that I will succeed in the exams." Boxplots display medians, interquartile ranges, and outliers.

When asked to identify which of four sources—others' performance, previous experience, encouragement from others, or physical and mental states—most influenced their belief in success, the majority of students cited *previous experience* as having the greatest impact (see Figure 7). The qualitative, free-text responses revealed concerns about the lack of exam experience due to the pandemic, but also highlighted positive influences, such as prior studies and leadership experience (see Table 3). Additionally, the qualitative data suggest that some students developed better working habits during the pandemic, which may have positively contributed to their self-efficacy (see Table 3).
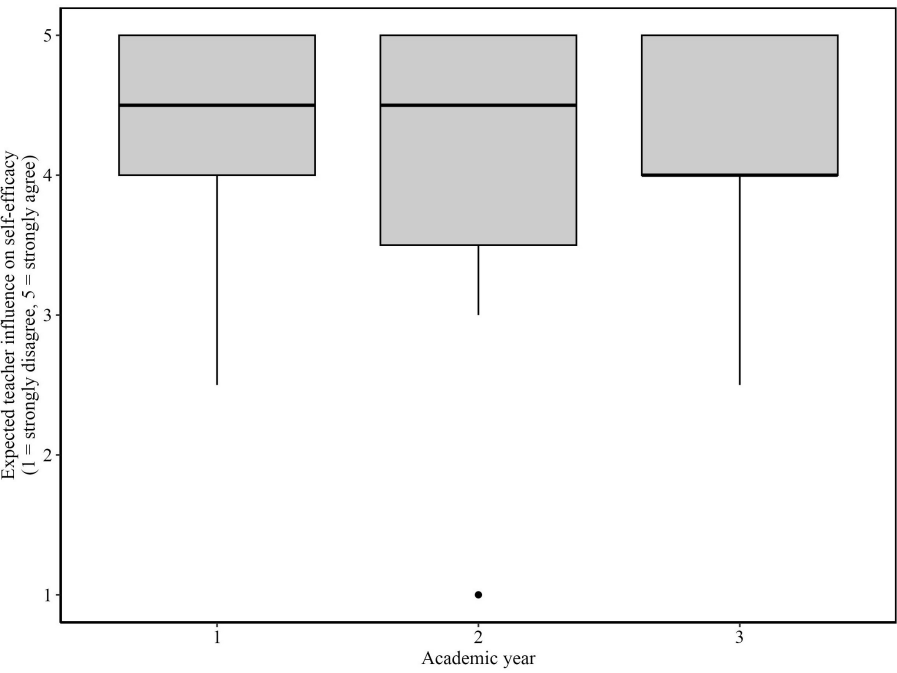
FIGURE 4
Expected influence of teacher feedback on students' self-efficacy across academic years. The expected influence of teacher feedback on self-efficacy was assessed with two items: "When teachers provide me with encouraging feedback, I gain more confidence in my own skills" and "Positive feedback on my performance (e.g., work requirements) from teachers will give me increased confidence that I can succeed in the exams." Boxplots display medians, interquartile ranges, and outliers.
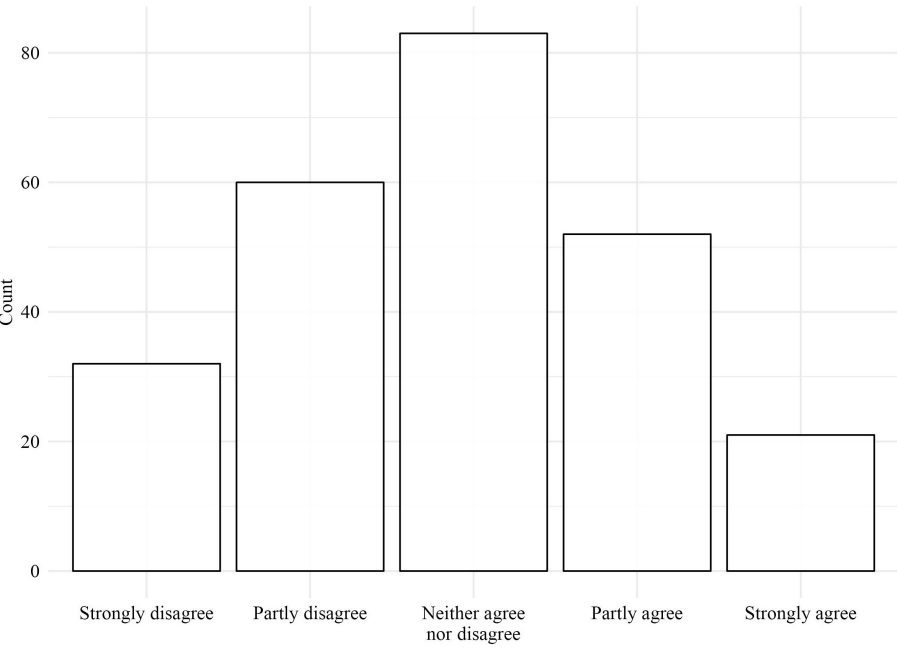

FIGURE 5
Experienced frequency of teacher feedback. The histogram shows experienced teacher feedback frequency, measured with one item: "The teachers in the study often give me encouraging feedback".
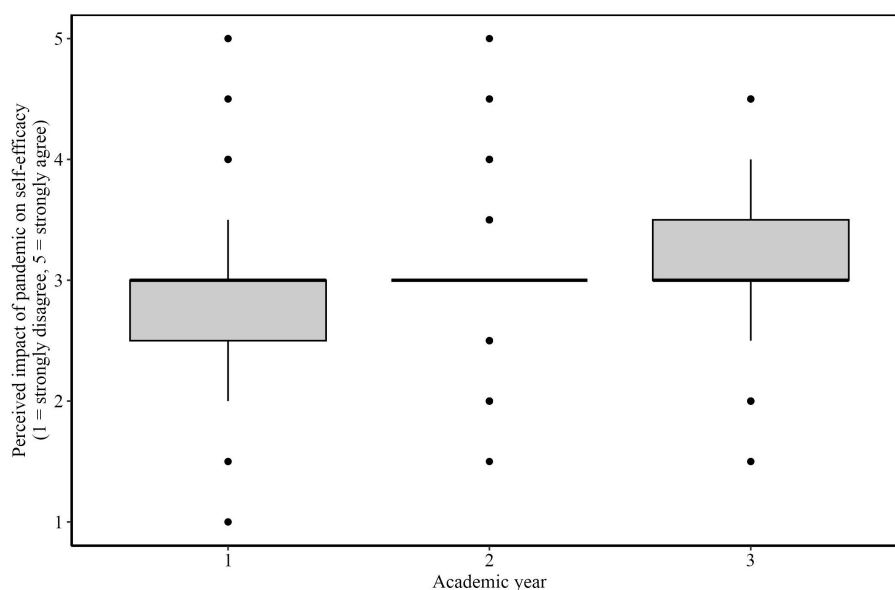
FIGURE 6
Perceived impact of the COVID-19 pandemic on students' self-efficacy across academic years. The perceived influence of the pandemic on self-efficacy was measured using two items: "I believe the pandemic has affected my chances of succeeding in my studies" and "I believe the pandemic has affected my chances of succeeding in the exams this semester." Boxplots display medians, interquartile ranges, and outliers.
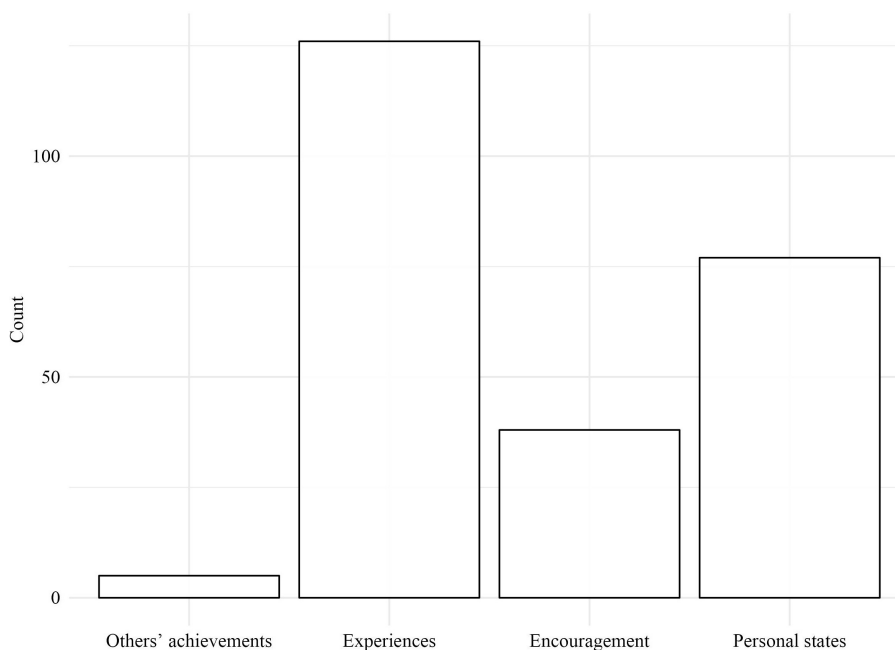

FIGURE 7
Factors expected to impact students' study success. The histogram shows factors expected to impact students' study success, measured with one item. Participants selected the source they believed most influenced their study success: others' achievements, previous experience, encouragement from others, or physical and mental states.

4 Discussion

In this study, we examined how the COVID-19 pandemic affected students' self-efficacy in the post-pandemic period. Specifically, we focused on the COVID-19 cohort in their first year of higher education and compared them with undergraduate students in their second and third years. Self-efficacy—defined as the belief in one's ability to perform a task—is essential for achieving desired outcomes, such as academic success (Manger and Wormnes, 2015). Given the extensive media discourse about the challenging starting point for COVID-19 cohort students (Aas, 2022; Hageberg, 2022), we hypothesized that their self-efficacy

might have been negatively affected. However, our results indicate that self-efficacy did not appear to be significantly influenced by the pandemic—a pattern that was consistent across all academic years.

Students in the current study reported relatively high levels of self-efficacy (averaging 4 out of 5) regarding their expectations for academic success. This pattern was consistent across genders and academic years, although a few outliers in the first and third years exhibited lower self-efficacy. These outliers were interpreted as natural variations within the data (Hair et al., 2009). Notably, these findings contrast with prior research emphasizing the negative consequences of the pandemic, such as Zoom fatigue among students and teachers (Breiby et al., 2022; Lee, 2020; Vee et al., 2022). The generally high levels of self-efficacy observed in our study offer a more nuanced understanding of the pandemic's impact on higher education.

A central factor in self-efficacy is previous experience, which Bandura (1997) identified as the most influential source of efficacy beliefs. In this study, the limited—or even absent—exam experience among COVID-19 cohort students could reasonably have been expected to negatively impact their self-efficacy. However, students reported that the pandemic had little or no effect on their academic success. One possible explanation is that students gained comparable experiences during home-schooling that fostered self-efficacy—such as working independently and completing exam-like assessments (Hageberg, 2022). Although not statistically significant, the relatively greater uncertainty expressed by first-year students may reflect a general unfamiliarity with the examination process in higher education, whereas third-year students likely felt more prepared due to prior exposure to a variety of exam formats.

Social comparison, another key source of self-efficacy (Bandura, 1997), was presumed to have been negatively affected by pandemic-induced isolation. However, our results indicate that students felt their self-efficacy increased when observing the success of their peers. Similarly, teacher feedback—identified as a critical influence on self-efficacy (Bong and Skaalvik, 2003)—was valued by students, although many reported receiving insufficient feedback. Students believed that greater teacher involvement and support would positively influence their self-efficacy.

The final source of self-efficacy encompasses personal resources such as mood, emotions, and resilience (Bandura, 1997; Pajares, 1997). While research has shown that students faced heightened mental health challenges during the pandemic—such as increased stress and reduced quality of life (Sivertsen and Johansen, 2022)—it is also possible that adversity fostered resilience among some students. Resilience is broadly defined as the ability to cope with stress (Herrman et al., 2011). One possible explanation is that, during the pandemic, students had limited control over many aspects of their education (e.g., lockdowns and changes in teaching methods), which may have affected them differently depending on their locus of control (Rotter, 1966; Judge and Bono, 2001). Although Bandura (1997) does not explicitly discuss locus of control, the concept is closely related to personal agency. The findings in this study suggest that some students developed a stronger internal locus of control—believing they could adapt—which may have helped them maintain or even enhance their self-efficacy. Conversely, those who adopted a more external locus of control—attributing difficulties to external factors—may

TABLE 4 Failure rate in the first semester of the bachelor's degree, year 2019–2023.

Study	Year				
	2019	2020	2021	2022[a]	2023
Social work	10.1	18.8	17.8	33.3	25.8
Psychology	6.9	3.2	0	4.4	8.6
Organization and management	1.8	1.3	0	18.9	3.3
Tourism	7.6	5.2	13.2	18.4	0
Economics and administration	42.2	33.7	46.1	47.9	35.0

For studies with several subjects in the first semester, the failure rate in the main subject is stated.
[a]The COVID-19 cohort.

have experienced a decline in self-efficacy. Accordingly, students who enhanced their self-efficacy may also have developed greater resilience, transforming the challenges of the pandemic into a source of confidence in their ability to succeed.

Another possible explanation for students' high self-efficacy is the Dunning–Kruger effect, in which individuals with limited competence overestimate their abilities (Dunning, 2011). This could help explain the discrepancy between students' self-efficacy and their actual performance, as reflected in the higher failure rates among COVID-19 cohort students during the autumn 2022 semester compared to earlier cohorts (see Table 4). However, performance in psychology courses—which admit students with the highest academic qualifications—showed lower failure rates, suggesting that academically stronger students may have been more resilient to pandemic-related challenges.

It is important to note that the gap between resourceful and vulnerable student groups may have widened during the pandemic (Nøkleby et al., 2021). Our sample consists of students who successfully completed high school and entered higher education, which may mean that more vulnerable groups are underrepresented. Future research should explore these disparities to gain a deeper understanding of variations in self-efficacy among post-pandemic students.

Findings from the qualitative data revealed that many students emphasized the importance of a supportive social environment in fostering self-efficacy. The students expressed a need for community, mutual encouragement, and a sense of belonging—factors not explicitly included in Bandura's (1977) original framework. These insights align with van Dinther et al.'s (2011) review, which highlights the significance of inclusive social environments in enhancing self-efficacy. This finding further underscores the nuanced impact of the pandemic on higher education, particularly for students who experienced prolonged social isolation and may require support in transitioning back to collaborative learning settings. In light of this, we propose the inclusion of an *inclusive social environment* as a potential addition to Bandura's framework.

This study provides valuable insights into the conditions that facilitate self-efficacy among post-pandemic students. The findings suggest that higher education institutions need not be overly accommodating to students from the COVID-19

cohort, as excessive adjustments may deprive them of critical mastery experiences essential for developing self-efficacy. While some students expressed a desire for simplified education and exams—an idea reflected in our qualitative data—such measures may ultimately undermine, rather than support, self-efficacy development. Bandura (1997) emphasized that a strong sense of efficacy is built through overcoming challenging tasks. This view is supported by prior research, such as a study among Korean university students taking a common freshman calculus exam, which found that successfully mastering a demanding assessment enhanced students' self-efficacy (Kim et al., 2014). These findings suggest that assessments should be designed to be challenging yet achievable, fostering both resilience and confidence—even among post-pandemic students. Additionally, institutions should prioritize the creation of supportive social environments to promote student success, particularly as hybrid and online learning become more prevalent.

Despite its notable strengths, this study has several limitations. First, the non-causal design prevents definitive conclusions about the pandemic's impact on self-efficacy. Second, although the study variables were based on Bandura's (1997) four sources of self-efficacy and adapted to the study context, a full-scale validation procedure was not conducted. Future research should consider using psychometrically validated scales tailored to this specific context to improve the robustness of findings. Third, self-reported self-efficacy is inherently subjective, capturing individuals' perceptions rather than objective performance. This introduces potential for social desirability bias, where participants may overestimate their self-efficacy, and for recall bias, particularly in retrospective evaluations of academic preparedness. While these limitations are common in self-report methodologies, they were mitigated through the use of validated Likert-scale items and neutral wording to reduce response distortions. Finally, the study's response rate was low, with only 19% participation and a relatively small sample from the COVID-19 cohort, raising concerns about representativeness. As with any study that does not employ random sampling, we cannot be entirely certain that the sample fully reflects the broader student population. It is possible that respondents had higher self-efficacy than non-respondents or that students most negatively affected by the pandemic chose not to participate. Nevertheless, the consistency of our findings with prior research on self-efficacy in educational settings (e.g., Bandura, 1997; van Dinther et al., 2011) supports their credibility, despite limitations related to response rate and self-reporting.

Future research should explore strategies to improve response rates, such as offering greater incentives or using targeted recruitment approaches to enhance representativeness. Additionally, employing random sampling and incorporating focus groups could improve generalizability and provide deeper insight into observed trends. Furthermore, future studies may benefit from complementing self-reported measures with behavioral assessments or longitudinal tracking to provide a more comprehensive evaluation of students' self-efficacy over time.

Despite these limitations, our findings challenge generalized assumptions about the pandemic's impact on students, offering a more nuanced understanding of self-efficacy in the context of higher education. Specifically, this study contributes to the ongoing discourse on the long-term effects of COVID-19 on education. By examining the self-efficacy of the COVID-19 cohort, it provides valuable insights for educators and policymakers aiming to support students in their transition to higher education. Understanding which sources of self-efficacy were most affected by the pandemic can inform targeted interventions to strengthen students' confidence and resilience in their academic pursuits. Moreover, the findings question assumptions that this cohort requires extensive curriculum adjustments, instead highlighting the importance of fostering self-efficacy through challenging, resilience-building experiences rather than simplified coursework.

Data availability statement

The datasets presented in this study can be found in online repositories. The names of the repository/repositories and accession number(s) can be found below: https://osf.io/fmbhq/?view_only=2772d8154896429aa280f59601a08305.

Ethics statement

Ethical approval was not required for the studies involving humans because participants could not be identified. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

VB: Writing – original draft, Writing – review & editing, Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Software, Validation, Visualization. MO: Writing – original draft, Writing – review & editing, Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Software, Validation, Visualization. RB: Writing – original draft, Writing – review & editing, Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Software, Validation, Visualization. SM: Writing – original draft, Writing – review & editing, Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Software, Validation, Visualization. TT: Writing – original draft, Writing – review & editing, Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Software, Validation, Visualization.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Generative AI statement

The author(s) declare that no Gen AI was used in the creation of this manuscript.

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