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Using Microlearning to Train Research Skills for Junior Social Researchers: Toward a Micro-researching Framework

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Abstract

Microlearning has been identified as an effective strategy for teaching and learning in various settings. However, little is known about its application in training and coaching research skills for junior researchers. This study aims to address this gap by investigating the perception and experiences of graduate students in the social sciences in Vietnam. We conducted semi-structured, in-depth interviews with 20 participants who had undergone a research skills training and coaching program using a microlearning approach. Self-Determination Theory and Expectancy-Value Theory were used as analytical lenses. The findings support the effectiveness of microlearning in this new context of training and coaching junior researchers in the social sciences. Learners' motivation functions as a dynamic, self-reinforcing system in which psychological needs (competence, autonomy, and relatedness) and perceived values (attainment, intrinsic, utility, and cost) co-develop and interact. This process gives rise to key outcomes, including academic achievements and continued use of microlearning, which in turn further reinforce both psychological needs and perceived values. The findings suggest the emergence of a new framework termed micro-researching for guiding both learning and supervision. The findings offer theoretical and practical insights into how microlearning can support motivation and capability development in research training contexts.

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Practitioner Notes

1. Supervisors and research coaches should structure research training into small, clearly defined tasks to support step-by-step engagement in research work.
2. Junior researchers should move flexibly between brief learning inputs and immediate application through real research tasks.
3. Supervisors should use micro research achievements to monitor and support learner progress.
4. Research coaches should encourage peer learning so junior researchers can develop practical skills beyond supervisor guidance.
5. Supervisors and junior researchers should view micro-researching as a collaborative process that builds independence and sustained research engagement.

Keywords

microlearning, micro-researching, academic development, research skills, social sciences.

Introduction

Microlearning has been regarded as one of the important innovative approaches in teaching and learning over the past two decades, with early conceptualisations (e.g., Hug, 2005; Buchem & Hamelmann, 2010) and more recent applications across diverse educational contexts. Initiated by the trainers and education designers in the corporate sector, microlearning has expanded its impact into other formal educational levels such as undergraduate education (McKee & Ntokos, 2022), vocational education (Billert et al., 2022; Leela et al., 2020), and secondary education (Nikou & Economides, 2018; Surahman et al., 2019). In terms of subject, microlearning has been employed by instructors in different subjects such as English (Hanafiah et al., 2022), mathematics (Gün Sahin & Kirmızıgöl, 2023), physical education (Ba & Qi, 2021), health professions (De Gagne et al., 2019), and information technology (Pan et al., 2022).

Despite differing conceptualizations, microlearning is generally characterized by a set of distinct features and associated benefits that make it an effective and adaptable approach to learning. It is a flexible and learner-centered instructional approach characterized by brevity, focus, and adaptability (Samala et al., 2026; De Gagne et al., 2019; Hesse et al., 2019). Learning content is divided into short, self-contained units that can be completed within minutes and accessed anytime, anywhere (Buchem & Hamelmann, 2010; Díaz Redondo et al., 2021). Unlike traditional macrolearning, microlearning allows learners to self-direct their learning by selecting topics that meet immediate needs or interests (Buchem & Hamelmann, 2010; Shamir-Inbal & Blau, 2020). These bite-sized modules, often delivered through videos, quizzes, or mobile applications, enhance engagement and retention by aligning with contemporary learners' attention patterns and digital habits (Orwoll et al., 2017; Taylor & Hung, 2022). Empirical evidence further suggests that microlearning improves knowledge acquisition, motivation, and confidence while supporting personalized and on-demand learning experiences (Nikou & Economides, 2018; Choudhary & Pandita, 2023; Alias & Razak, 2024).

Although microlearning has been massively adopted in various contexts and proven advantages, little is known about its application in training research skills. For instance, in a scoping review on the effects of microlearning, Taylor and Hung (2022) identified only one study focusing on medical research skills training. According to Díaz Redondo et al. (2021), this pedagogical approach tends to be more suitable for basic knowledge acquisition or simple conceptual understanding rather than for complex tasks requiring higher-order reasoning. In addition, research education, particularly at the graduate level, often faces persistent challenges such as research orientations (Liljedahl et al., 2025), lack of academic writing skills (Glew et al., 2014), and insufficient scaffolding for novice researchers (Khosa et al., 2023). Contrary to the views of Díaz Redondo et al. (2021) and Taylor and Hung (2022), future research is encouraged to examine the potential of microlearning for conveying abstract or less tangible forms of knowledge (Zhang and West, 2019). This approach could provide a more accessible and practice-oriented pathway for developing research competence.

This study explores junior researchers' perceptions and experiences after participating in microlearning-based training and coaching in research skills in Vietnam. By doing so, this study aims to answer the question: How do junior researchers perceive the dynamic interplay between psychological needs and perceived values in shaping their motivation and academic outcomes in microlearning-based research training?

Building on these insights, it proposes a micro-researching framework that expounds how microlearning supports the development of research competence and motivation. The study makes two distinct contributions. First, the integration of two theoretical lenses, Self-Determination Theory (SDT) and Expectancy-Value Theory (EVT), is employed to illuminate the motivational mechanisms underlying research learning through a microlearning-based approach. This contribution also helps bridge a notable gap in the academic coaching literature, which has predominantly focused on contexts in the US and the UK (Mahdi et al., 2024). Second, the study broadens the scope of microlearning research by conceptualising its mechanisms within the context of research skill training, thereby introducing a framework of micro-researching operationalising microlearning principles for the training of novice researchers.

Literature

Microlearning in Higher Education

A growing body of research has investigated the integration of microlearning within higher education, especially after COVID-19 pandemic (Samala et al., 2026; Chamorro-Atalaya et al., 2024; Pham et al., 2024). According to recent bibliometric analyses, higher education is among the most extensively examined educational contexts in the microlearning literature (Pham et al., 2024; Leong et al., 2020). This prominence can be attributed to the fact that university students are more self-directed (Leong et al., 2021) and the sector readily embraces innovative teaching approaches (Pham et al., 2024). Many studies have investigated the effectiveness and adaptation of microlearning across diverse disciplines such as medical education, engineering, information technology and language education (Samala et al., 2026; Chamorro-Atalaya et al., 2024; Pham et al., 2024; Qian et al., 2021; Skalka & Drlik, 2020). For instance, a controlled-group study of undergraduate medical students in China found that COVID-19 knowledge micro-lessons combined with case-based learning significantly improved both the acquisition, retention and created more positive clinical practice attitude (Qian et al., 2021). Another longitudinal investigation by Skalka and Drlik (2020) in the field of information technology showed that combining automated code assessment with microlearning units improved students' foundational programming skills and strongly predicted their final performance. In the same vein, the evidence suggests that microlearning can bring positive impacts on learning outcomes, competences, retention, engagement and motivation (Taylor & Hung, 2022; Alias & Razak, 2024; Díaz Redondo et al., 2021). Further, microlearning applications have shown effectiveness in enhancing soft skills in higher education contexts (Chamorro-Atalaya et al., 2024), particularly, teamwork skills, leadership skills, communication skills, time management skills, and emotional intelligence (Luo & Li, 2025).

While many studies emphasise the benefits of microlearning in teaching disciplinary knowledge, language, and soft skills, there remains little evidence on its application in research training. In Yao and Ho (2024)'s research, 98 undergraduate students took a set of tests and surveys before and after completing a microlearning module designed for a research methods course, and findings showed that microlearning is an effective, efficient, and appealing approach for adult learners in higher education. Similarly, Sawarynski and Baxa (2019) demonstrated that an online module bank supporting medical students' research milestones enabled just-in-time learning, increased engagement, and facilitated personalised navigation through the research process. Even though these studies evaluate the usefulness of microlearning in the context of research

training, they did not delve into a whole actual research process and microlearning only integrated in complementary materials for self-study, and most relied primarily on quantitative data, leaving learners' qualitative experiences underexplored.

Apart from these content design and evaluation studies, researchers have also developed and assessed microlearning-integrated platforms and applications in higher education contexts. For example, Robles et al. (2023) employed a Design-Based Research (DBR) approach to design a mobile microlearning application targeting reading comprehension. This study contributes a framework for developing other similar learning applications. Similarly, Kustandi et al. (2024) proposed a microlearning-based MOOC model to foster independent learning in university settings. However, despite these advances in tool and platform development, designing such platforms specifically for research skill development remains underexplored.

Training research skills for graduate students and junior researchers involves complex reasoning, conceptual understanding as well as advanced analysis skills, which differs from other training activities in other education levels. According to Díaz Redondo et al. (2021), microlearning is not applicable for all learning contexts. Specifically, microlearning activities are more convenient to supplement the acquisition of skills that are strengthened through repetition and practice. However, this approach is not effective for complex conceptual learning. Taylor and Hung (2022), concurring with Díaz Redondo et al. (2021), posit that microlearning is more suitable for acquiring specific information for a specific purpose or learning simple concepts through short lessons, rather than instruction that involves extensive reasoning or in-depth comprehension, which is typical attributes of research skills (Stokking et al., 2004). On the same page, in their review of microlearning-related articles from the EBSCO and Scopus databases, Zhang and West (2019) revealed that all reviewed papers reported microlearning to be effective for skill-based training. Hence, the authors recommended that subsequent research investigate the capacity of microlearning to transmit complex or non-concrete forms of knowledge, thereby advancing the scholarly discourse on its pedagogical applications. This highlights the need to expand the application of microlearning toward the cultivation of higher-order research skills, moving beyond basic procedural training or simple conceptual learning.

Theoretical Framework

Self-determination theory (SDT) distinguishes between intrinsic motivation (driven by internal interest and satisfaction) and extrinsic motivation (influenced by external rewards or pressures), both of which explain why individuals initiate and sustain certain behaviours (Ryan & Deci, 2000). Building on this foundation, SDT was later expanded into a motivation continuum to capture the extent to which behaviour is self-determined or externally regulated (Ryan & Deci, 2000; Ryan & Deci, 2020). Central to SDT are three basic psychological needs: competence, autonomy, and relatedness. Competence refers to "the feeling of mastery, a sense that one can succeed and grow" (Ryan & Deci, 2020, p.1); autonomy reflects "a sense of initiative and ownership in one's actions" (Ryan & Deci, 2020, p.1); and relatedness concerns "a sense of belonging and connection. It is facilitated by conveyance of respect and caring" (Ryan & Deci, 2000, p.1). The theory posits that the satisfaction of these three basic psychological needs can either enhance or undermine intrinsic motivation, depending on how well these needs are fulfilled.

Expectancy-value theory (EVT) is another prominent motivational framework that focuses on two key components: expectancy for success and the subjective task value of an activity. Expectancy

belief for success refers to individuals' "beliefs about how well they will do on upcoming tasks, either in the immediate or longer-term future" (Wigfield & Eccles, 2000, p. 70), while task value comprises four components. First, attainment value is defined "as the importance of doing well on a given task" (Wigfield & Eccles, 2000, p.72). Second, intrinsic value is "the enjoyment one gains from doing the task" (Wigfield & Eccles, 2000, p.72). Third, utility value (usefulness) refers to "how a task fits into an individual's future plans, for instance, taking a math class to fulfill a requirement for a science degree" (Wigfield & Eccles, 2000, p. 72). Fourth, cost reflects "how the decision to engage in one activity (e.g., doing schoolwork) limits access to other activities (e.g., calling friends), assessments of how much effort will be taken to accomplish the activity, and its emotional cost" (Wigfield & Eccles, 2000, p. 72). The theory explains how motivation shapes individuals' choices, persistence, and performance (Wigfield & Eccles, 2000). Specifically, individuals are more likely to engage and perform well in a task when they believe they can succeed (high expectancy) and perceive the task as valuable (high task value). Thus, the interplay between expectancy beliefs and task values provides a powerful explanation for variations in learners' motivational strength and achievement behaviours.

As motivational theories, SDT and EVT share certain conceptual overlaps. For instance, intrinsic value and utility value in EVT parallel intrinsic and extrinsic motivation in SDT, respectively. Despite these similarities, the two theories stem from distinct theoretical traditions and emphasize different aspects of motivation (Wigfield & Eccles, 2000). SDT, focusing on the fulfilment of psychological needs, was commonly used in microlearning studies (e.g., Nikou & Economides, 2018) to investigate the impact of microlearning on learners' learning performance and motivation. Whereas, EVT emphasised cognitive evaluations of task-related beliefs and values. As a result, the integration of SDT and EVT provides a comprehensive analytical lens, revealing how internal motivational drives interact with external regulatory factors to shape individuals' behavioural decisions (Zhou et al., 2025).

In this study, psychological needs (competence, autonomy, and relatedness) capture learners' internal motivational states, while expectancy beliefs and task values (attainment, intrinsic, utility, and cost) explain how learners evaluate research-related tasks. Two other outcome constructs were added to the framework to link motivational processes to outcomes and intention. Academic achievement serves as an indicator of students' performance outcomes and a representation of their academic ability (York, Gibson, & Rankin, 2015). Continued use refers to learners' intention to continue to use a product or service which is microlearning in this study (Dehghani, 2018). The framework guiding both data collection and interpretation can help explain how microlearning environments can simultaneously nurture learners' internal needs and strengthen belief-driven effort, ultimately influencing academic achievement and intention to apply this approach in research learning and training.

Method

Context

In Vietnam, the social sciences are often perceived as less valued than the hard sciences and this is reflected in the number of publications in international databases. Although the growth rate of Vietnam's social science outputs is increasing, these contributions in international scholarly databases such as Web of Science (WoS) and Scopus remain modest and significantly lower

compared to Science, Technology, Engineering, and Mathematics (STEM) disciplines (Trinh et al., 2020). Such a pattern may be rooted in Vietnam's long-standing preference for STEM disciplines over the social sciences (Trinh et al., 2020). In recent years, the government and higher education institutions have attempted to improve the research capabilities and boost international publications in both hard and social sciences, including through curriculum reform and research training for graduate students (e.g., Nguyen & Nguyen, 2020). Alongside these top-down initiatives, numerous bottom-up communities of practice and training or coaching services have been established to support junior researchers and promote critical thinking about knowledge production, exemplified by Engaging with Vietnam (Engaging with Vietnam, n.d.) and the VietTESOL Association (see Le, 2022).

Research Design and Data Collection

Participants in this study were recruited from a non-credit training and coaching program for junior researchers in the social sciences in Vietnam, referred to as the RC program. It should be noted that the RC program is a pseudonym; the real name has been changed to ensure the confidentiality of information. The RC program, established in 2018 by an overseas-trained doctoral returnee in Vietnam, is currently run by a private research institute and offers various research skills courses, such as Introduction to Research in Social Sciences, Academic Reading and Writing, Econometrics, Advanced Methods in Data Analysis (primary data), Advanced Methods in Data Analysis (secondary data), and Systematic Review, among others. Although the program is not-for-profit in orientation, it still charges fees for participation in its training courses. In addition to training, the RC program provides coaching activities in which junior researchers are mentored or coached by experienced researchers while conducting specific research projects. Learners also join several small research groups and collaborate regularly, both online and offline. Overall, the RC program is somewhat similar to a community of practice (Nicolini et al., 2022) for K-12 teachers, except that its members are not teachers, but junior researchers.

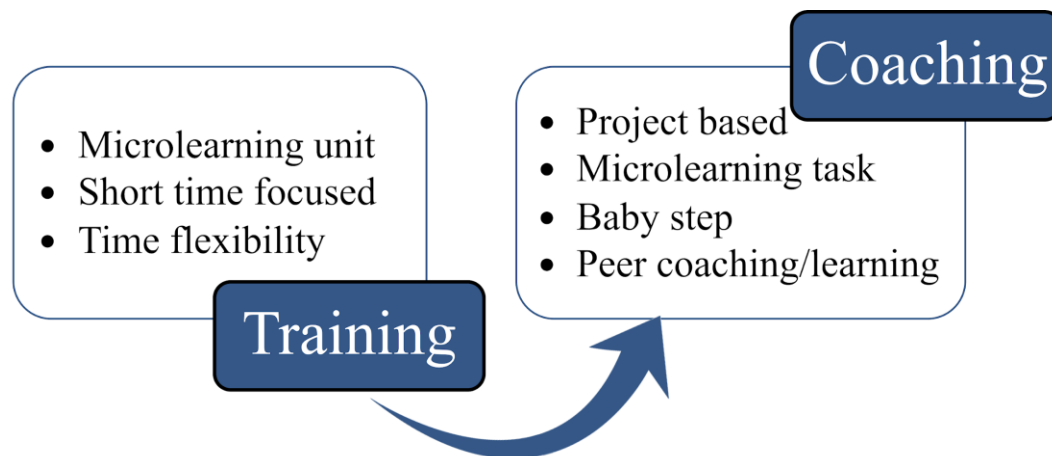
Learners involved in this program are Vietnamese junior researchers (i.e., graduate students and early-career researchers with a PhD degree) in social sciences, including economics, business administration, psychology, education and tourism to name a few. The purpose of their participation in this program is to enhance their research capabilities, which will help them achieve their academic goals, such as completing and graduating from Master's and PhD programs, obtaining scholarships to study abroad, or publishing papers in Scopus or WOS-indexed journals. Junior researchers in social sciences in Vietnam often need additional programs due to the low quality and outdated coursework in their formal graduate programs (Pham, 2020; Hai Minh, 2023). Particularly, it is reported that graduate students have not received sufficient guidance and instruction from their supervisors or there is a lack of qualified supervisors relevant to candidates, hindering knowledge production in Vietnam (Nguyen, 2020; Nguyen et al., 2025). Thus, participating in bottom up and extra curricula programs like RC is a measure to enhance research skills for many junior researchers in Vietnam (Pham, 2020).

The RC program declares their use of microlearning during both training and coaching phases, demonstrated by the attributes represented in Figure 1. Training syllabi are divided into micro-content with singular learning outcomes (Buchem & Hamelmann, 2010). In addition to offline training classes or synchronous online sessions, all learners are able to access asynchronous online training clips (each clip lasts about 5-7 minutes covering a micro-content lesson) for self-

learning purposes (Díaz Redondo et al., 2021). In the coaching phase, learners are assigned small research tasks suited to their capabilities and needs, supervised by a coach (i.e., experienced researcher) who provides timely feedback and advice (De Gagne et al., 2019). This approach is expected to help learners improve their research capabilities through "baby-step" tasks at their own pace. During the coaching phase, learners are expected and encouraged to engage with other learners within the program in order to teach each other small research skills (Lemon & Salmons, 2020).

Figure 1

Training and Coaching Model of Research Skill Development in the RC Program



This study used semi-structured interviews to qualitatively examine how learners experienced changes in their psychological needs, perceived values and learning outcomes during the microlearning-based research training. This method is particularly suited for capturing the depth, nuance, and relational dynamics that cannot be adequately explored through quantitative surveys (Cassell & Symon, 2004; Kvale & Brinkmann, 2009).

Guided by a deductive qualitative design (Braun & Clarke, 2022), the study began with the identification of a priori themes derived from the theoretical framework (see Figure 2), specifically the constructs drawn from SDT (Ryan & Deci, 2000) and EVT (Eccles & Wigfield, 2002). Based on these pre-established themes, a semi-structured interview protocol consisting of open-ended questions was developed to ensure alignment between data collection and the study's conceptual framework. Following each interview, the data were coded and analysed in relation to the candidate themes. During the review and refinement stages, these themes were examined against the dataset to ensure that they reflected nuanced expressions of the core concepts rather than forcing the data into predetermined categories. Finally, the writing phase integrated the analytic insights into a coherent narrative that interpreted the findings in light of the guiding frameworks, moving beyond mere description toward theory-informed explanation.

The recruitment of participants is voluntary-based. Learners who have been involved in both training and coaching activities of the RC program were invited to participate in the in-depth interviews. Each in depth interview was undertaken face-to-face offline or online via Zoom and lasted about 40-80 minutes. All interviews were digitally recorded and subsequently transcribed verbatim for analysis. Among 20 participants, ten are male and ten are female. Their ages range

from 22 to 40. Regarding the educational level, five are master students; whereas fifteen are PhD candidates. In terms of field of study, nine are in the major of management; meanwhile the respective figures in other fields, including education, psychology and economics are seven, three, and one, respectively (see Table 1).

Table 1

List of Participants

No	Pseudonym	Gender	Age	Educational Level	Field of study
1	Ninh	Male	28	PhD Candidate	Management
2	Nam	Male	33	PhD Candidate	Management
3	Thu	Female	35	PhD Candidate	Education
4	Hung	Male	40	PhD Candidate	Education
5	Tuan	Male	40	PhD Candidate	Management
6	Hang	Female	32	PhD Candidate	Management
7	Ngan	Female	40	PhD Candidate	Education
8	Thanh	Male	32	PhD Candidate	Management
9	Dung	Male	22	Master student	Education
10	Cham	Female	27	Master student	Psychology
11	Chinh	Female	31	PhD Candidate	Economics
12	Thao	Female	26	Master student	Education
13	Luong	Male	22	PhD Candidate	Management
14	Huong	Female	36	PhD Candidate	Management
15	Tam	Female	40	PhD Candidate	Management
16	Hoang	Male	40	Master student	Education
17	Anh	Male	22	Master student	Psychology
18	Hoa	Female	36	PhD Candidate	Education
19	Nga	Male	38	PhD Candidate	Management
20	Thinh	Female	27	PhD Candidate	Psychology

Development of In-Depth Interview Questions

We developed in depth interview questions based on the extant literature. Specifically, the central purpose of this study is to investigate the perceptions and experiences of junior researchers after being trained and coached at the RC program, using the microlearning method. Thus, this purpose is examined in different aspects/concepts stemming from several related theories, including SDT (Ryan & Deci, 2000), and EVT (Wigfield & Eccles, 2000). Given the nature of the

semi-structured interview, during the interview sessions, we adjusted or added more questions to the participants, depending on each case. Key interview questions explored (1) perceived changes in competence, autonomy, relatedness, attainment value, intrinsic value, utility value, cost, expectancy beliefs for success, academic achievements, and continuous usage intention during learners' microlearning experiences; and (2) How these changes interact, influence one another, and contribute to learners' overall development throughout the microlearning process.

Some sample in-depth interview questions include: How do you perceive changes in your autonomy during the experience of learning research skills with the microlearning method? How do you perceive changes in your interest or enjoyment in learning and researching during the experience of learning research skills with the microlearning method? How do you perceive changes in your competence in learning and researching? How has the application of the microlearning method in learning and researching influenced your collaboration and teamwork with others, both within and outside of the RC program? Based on your experience with the microlearning method, how do you perceive the relationship among competence, autonomy, and relatedness? How does learning and researching through microlearning help you achieve your academic goals? (such as publishing papers, earning a PhD, being accepted into postgraduate programs, obtaining scholarships, or securing research grants)? Does achieving academic outcomes influence your psychological needs (competence, autonomy, and relatedness) or perceived values? Do you have any difficulties or barriers during the experience of learning research skills and doing research using the microlearning method? To what extent do you feel confident in achieving your future learning and research goals? Do you intend to use the microlearning method in the future? Why?

Ethical Considerations

This study adhered to research ethics principles in line with the Committee on Publication Ethics. As part of a project funded by Vietnam's National Foundation for Science and Technology Development (NAFOSTED), the research plan and protocol—including ethical considerations—were reviewed and approved by NAFOSTED's Scientific Committee (Decision No 06/QĐ-HĐQL-NAFOSTED). All junior researchers participated voluntarily after providing informed consent and were informed of their right to withdraw at any time without penalty. The interview questions were designed to be non-intrusive and unlikely to cause harm or distress. Data were anonymized, stored securely, and used solely for research purposes to protect confidentiality.

Positionality

All qualitative research is subject to potential bias arising from researcher subjectivity, and this study is no exception (Holmes, 2020). Both authors are members of the RC program: one was formerly a learner, while the other is a coach who has taught and provided 1-1 coaching to program participants. Both authors were involved in all interview sessions and were familiar with most interviewees before the interviews. This insider position may have supported rapport, but it also created the risk of socially desirable responses and researcher prejudgments shaping findings interpretation (Holmes, 2020). Because this study followed a deductive qualitative approach, particular attention was paid to the possibility of confirmation bias. To address this, the two authors engaged in reflexive discussion throughout data collection and analysis, compared interpretations, and remained attentive to responses that did not fully align with their initial

imagination. The aim was not to remove subjectivity entirely, but to acknowledge and manage it transparently in order to ensure the validity of this study (Nowell et al., 2017).

Results

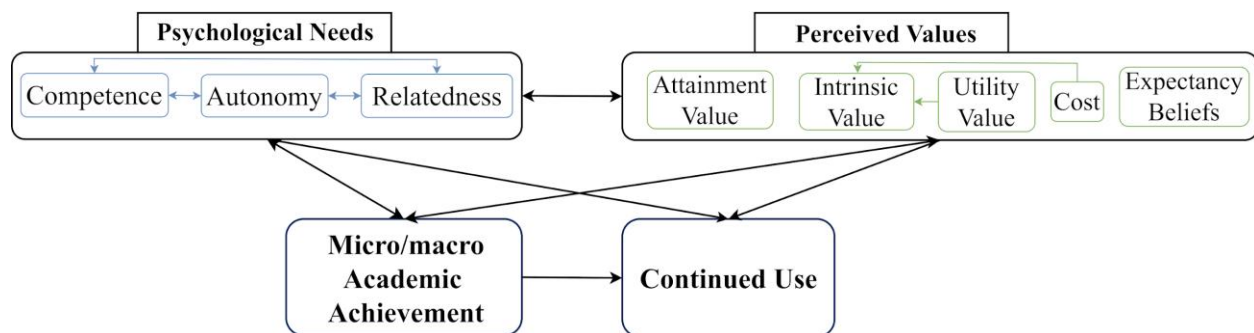
This section presents results from semi-structured interviews with junior researchers who participated in a research skills training and coaching program using the microlearning approach. The interview protocol was informed by established theories including SDT and EVT. The findings can be conceptualised as a dynamic system consisting of interconnected psychological needs and perceived values, which interact through a self-reinforcing motivational process and contribute to key outcomes. Participants' psychological needs (competence, autonomy, and relatedness) were not developed in isolation but developed in an interconnected manner. Similarly, perceived values (attainment value, intrinsic value, utility value, and cost) and expectancy beliefs for success co-evolved alongside these psychological needs, forming mutually reinforcing relationships. Within this system, participants' motivation evolved as a self-sustaining process rather than a linear pathway. This dynamic interplay gave rise to key outcomes (academic achievement and continuous usage intention) that, in turn, reinforced both psychological needs and perceived values. A conceptual model illustrating the relationships is presented in Figure 2.

The Interconnected Development of Psychological Needs

Participants consistently reported that their sense of competence has increased as they took part in training and engaged in microlearning-based activities (e.g., short, task-based practices supported by peer and coach feedback). A few participants demonstrated an awareness of the microlearning characteristics embedded in the program, such as the short duration of each activity—“each piece of content was delivered in about ten minutes with around three to four slides”—and the diversity of information-delivery channels, including e-books, links, and short videos to support self-study (Hung).

Figure 2

The Conceptual Model



Most participants described starting with limited understanding of research but gradually developing a solid foundation in writing scientific articles, understanding research methodologies, and conducting data collection and analysis. They also reported increased confidence in essential skills such as literature searching, argument construction, survey design, and responding to reviewer feedback. One participant reflected:

As someone who initially knew nothing about research, I really appreciated this research process and felt empowered because I was guided meticulously on what to do at each stage [...]. This approach made me feel much more confident. (Ninh)

The development of competence was closely associated with increasing autonomy. As participants became more confident in their research abilities, they reported a greater capacity to make independent decisions regarding topic selection, research design, and paper development. For example, one participant explained, “My sense of autonomy has significantly increased. Previously, I hardly knew how to write a research paper, but now I can orient myself to choose my own research topic, design a study, and write a complete paper” (Thu). It is highlighted that autonomy was closely tied to clarity in research method and overall research structure. Importantly, the relationship between competence and autonomy is not one-directional but reciprocal. Improved competence empowered learners to act independently, which in turn consolidated their sense of competence. One participant said:

When I can take ownership of my research topic, it gives me confidence. Conversely, when I feel confident in my ability, I become even more autonomous. The two influence each other, move together, and form a continuous circle of development. (Luong)

Alongside competence and autonomy, relatedness was found as a critical and interdependent component of participants’ experiences. A strong sense of relatedness was developed not only through support from mentors but also through collaboration with peers and participation in a shared research culture. When competence increased, participants often shifted their role from “a learner” to “a sharer”, sharing their insights and supporting peers, which further strengthened their sense of connection. Some participants who felt competent reported that they were willing to discuss and share their knowledge with peers, which made them feel more related with the community (e.g., Anh and Luong). In addition, microlearning practices also played a role as a shared working norm within the RC community, providing a common structure that facilitated coordination and collaboration. This shared approach created a sense of collective direction and supported more efficient teamwork among members. For example, one participant noted that although external collaborators were unfamiliar with segmented, micro-task–based processes, RC members used them consistently, giving the group “a shared direction” that improved coordination (Hung). Another participant likewise observed that this common way of working fostered a close-knit environment and enabled smoother teamwork (Nga).

Notably, relatedness did not merely co-exist with competence and autonomy but actively reinforced them. Emotional support, shared accomplishment, and mutual trust within the research community appeared to strengthen participants’ sense of competence and autonomy. Several interviewees shared that they believed there was support from the RC community when they needed it. Being embedded in a supportive network enabled them to approach challenges with greater confidence in their ability, as they perceived that solutions could be found through interaction with more experienced peers. As a participant explained, “I feel more confident now. If I get stuck, I’m confident that there will be a solution and that solution will likely come from people who are much more knowledgeable than me in the community” (Thao). Similarly, relatedness also stimulated autonomy. The trust and psychological safety built through

collaboration encouraged learners to take initiative and maintain ownership of their work while still benefiting from guidance. Rather than constraining independence, feedback from coaches and peers functioned as a scaffold that supported self-directed problem-solving. As another participant reflected:

The coach gave frequent feedback — on the overall structure, the writing flow, and how to resolve issues in the paper [...]. There was room for autonomy, though — we were free to keep our own style, and there wasn't just one right answer. (Nga)

The Co-development of Perceived Values and Expectancy Beliefs

Participants' perceived values and expectancy beliefs were found to develop dynamically in relation to their engagement in microlearning-based research tasks. Many reflected on some characteristics of the tasks that aligned with and, in some cases, extended their existing value, practice, and identity. For example:

I studied a course on the philosophy of forecasting in my undergraduate years [...] This philosophy is quite similar to microlearning, where each component is complete on its own but also works well as part of a larger whole. I've been applying that approach since my earlier learning experiences. (Tuan)

Actually, the way I work with students has always been like that—it didn't just start after the research training at RC. I usually tell them that doing a thesis involves several steps, and I guide them through each one. After they complete a step, I read their work, give feedback, and only then do we move on to the next step. (Hoa)

These reflections revealed microlearning sharing some common features with the way participants had previously approached teaching and learning, suggesting that value was not only recognised but also anchored in existing cognitive and professional frameworks. Such findings illustrate participants' attainment value—their perceived personal importance they attach to microlearning-based research tasks (Wigfield & Eccles, 2000). Beyond alignment with existing identities, several participants described how the training reshaped their professional identity, shifting their view of themselves from teachers to contributors to academic knowledge. This shift suggests that attainment value was not static but redefined through participation in the training. As Ninh noted, "Now, I want to become someone who generates knowledge and contributes to the broader academic community", indicating the increasing importance of research to their meaningful professional goals.

Intrinsic value as defined in Expectancy-Value Theory, refers to the enjoyment or satisfaction that an individual experiences at a task (Wigfield & Eccles, 2000). While some participants reported their prior interest in research, many participants described a progressive increase in enjoyment and enthusiasm for research, which is facilitated by the structured and manageable nature of microlearning-based tasks. This can be explained that microlearning enabled participants to experience frequent moments of clarity, control and accomplishment within the research process. For instance,

I really like this approach [microlearning] because I was guided, so I know how to select from all the available information—what to choose, what to analyse, and how to move forward with writing the next parts. (Thu)

Utility value refers to the future usefulness of a task (Wigfield & Eccles, 2000). In this research, participants consistently perceived microlearning-based training courses were useful for their future academic and professional development. This perception was primarily driven by the extent to which the training provided clear, actionable pathways for achieving academic goals, such as completing a Master's or PhD program, publishing research, developing disciplinary expertise, and producing outputs with practical applications. In particular, participants emphasised that the structured and step-by-step nature of microlearning enabled them to translate abstract research processes into manageable and applicable procedures, thereby increasing the perceived usefulness of the training. As one participant explained:

I learned how to identify what I need to do to write a paper using the bibliometric method—what steps to take, what the process looks like, and what the final product should be. After that, I can apply it to my own project. That time, the paper will be mainly done by me. (Luong)

Microlearning-based training can be useful for their teaching practices. The opportunity to revisit updated courses not only reinforced their understanding of theoretical knowledge but also enhanced their pedagogical approaches.

Sometimes, I retake those courses not only to review the theoretical knowledge but also to observe how the instructors update and deliver the content, so I learn both the subject matter and the teaching methods. This helps me enhance both my learning and my teaching practices. (Hang)

Beyond academic and teaching benefits, in some cases, microlearning can be a strategic solution for their personal challenges, such as self-discipline (Cham). When participants recognized the significance of research to their personal and professional growth, this sense of utility often translated into genuine interest. One participant shared that he understood the value of research to his future career and therefore “found it more interesting” (Luong).

These findings suggest that utility value was not limited to perceived future benefits but was actively constructed through participants' ability to connect training activities with academic, professional, and personal goals. In some cases, it also facilitated the internalisation of interest as usefulness gradually translated into intrinsic value. Expectancy beliefs refer to an individual's confidence in their ability to succeed in a task (Wigfield & Eccles, 2000). A few participants emphasized that even before attending the training courses, they held a strong belief in achieving their goals. For them, this mindset served as a compass, guiding their actions and building their confidence in their capabilities. A participant highlighted:

I think before entering any program, like a Master's or PhD, I need to know what I'm going to do, where my goal is, and how long it will take to get there, so I can

break down my time accordingly. [...] The task must be done and the goal must be achieved. I can find the most effective strategies to achieve what I want. (Anh)

Despite these positive impacts, there may be concerns toward microlearning-based training. Perceived cost refers to the constraints or barriers that may discourage individuals from engaging in a task (Wigfield & Eccles, 2000). First, although earlier sections highlighted the benefits of microlearning-based training, several interviewees also noted limitations in applying this approach to research practice. In particular, they emphasized that microlearning requires a foundational level of subject knowledge; without it, learners may struggle to absorb and implement content efficiently. The following quote of Ngan supported this above argument, “This method only works when you already have a certain foundation and some experience”. Second, applying microlearning in practice can be time-consuming, particularly during the initial stage of breaking a research topic into small, manageable tasks. As Huong commented, “It helps us break down a plan into detailed, structured steps, but doing so also demands significant investment—in both time and in deeply exploring the research topic. Only then can we map out a plan to move forward”. Third, microlearning-based training could also reduce intrinsic value. Although their skills had improved, a few interviewees reported feeling more confused than confident, as greater awareness of research complexities sometimes diminished their sense of enjoyment. As Hung shared, “In fact, I feel even more confused... Once I visualize everything, I see the difficult parts, the parts I have to work on, and where I’ll need to seek support”. This suggests that greater cognitive awareness could simultaneously enhance understanding while diminishing immediate enjoyment.

Motivation as a Self-Reinforcing Process

Participants' motivation can be conceptualised as a self-reinforcing process in which perceived values and psychological needs continuously interact and strengthen one another. Rather than operating as separate factors, these elements formed a reciprocal system that sustained engagements in research activities.

First, attainment value was found to be a key driver of competence. Recognizing the importance of research tasks encouraged junior researchers to engage more actively, resulting in improved self-efficacy and capability (Bandura., 1977). For instance, a few participants reported that after completing the microlearning-based training, they realized that research suited them and that they were “ready to become scholars who not only pursue lifelong learning but also transfer and produce knowledge” (Anh). This suggests that valuing research as part of one’s identity can increase effort and skill development.

Second, intrinsic value was also reinforced by the enhancement of psychological needs. Increased competence enabled participants to engage more deeply with research tasks, thereby evoking their interest and enjoyment in research activities. As one participant noted: “as I’ve come to understand research methods and direction, I’ve been able to generate many more ideas”. Similarly, enjoyment was linked to increased confidence and resilience in responding to peer feedback. Ninh remarked, “I’ve improved in accepting and responding to feedback or reviews. In the past, I used to feel offended and would freeze for a while. Now, I’m more aware of the language used in academic peer review, which can be harsh”. At the same time, relatedness

contributed to the increase in enjoyment. As one participant shared, “The RC courses gave me opportunities to work with people on similar topics, which made learning more enjoyable and motivating” (Luong). These findings indicate that enjoyment was not inherent to the task itself but emerged through the interaction between competence development and social support.

Third, strong expectancy beliefs for success helped build competence because confident learners tended to put in more effort, persist through difficulties, and use more effective learning strategies—actions known to support competence development (Schunk, 1991). In turn, these expectancy beliefs were reinforced by participants’ increasing competence, their accumulated research experience, the support of their networks, and a clearer sense of research direction. Almost all interviewees reported that after completing the training courses, they felt more confident in achieving long-term goals, such as publishing in academic journals or completing advanced degrees.

In the end, I think I will achieve my goals like publishing a journal article or completing my PhD. When it comes to publishing, microlearning is an approach that I can apply to any new research field to gain mastery in it, or to learn a research method from the very first steps until producing a publishable paper. (Chinh)

Fourth, the limited familiarity and inconsistent mastery of microlearning across different academic environments posed challenges in collaborative contexts (relatedness). Participants (e.g., Hung and Nga) mentioned that they did not use microlearning in collaboration with people outside the RC community or those who lack exposure to this approach. As a result, adaptations were necessary.

Outcomes and Reinforcing Mechanisms Within the System

Academic outcomes

Participants reported a range of academic achievements resulting from their engagement in training and research projects within the RC ecosystem. Several produced international research publications, with some serving as first authors (e.g., Hung and Tam) and others co-authoring book chapters (e.g., Luong and Anh). RC training also supported key academic milestones, including the successful completion and defence of master’s or doctoral theses (e.g., Dung and Thinh) and admission to postgraduate programs (e.g., Ninh and Nga).

Importantly, participants also highlighted smaller-scale yet meaningful accomplishments throughout the research training process. These include completing small tasks, mastering specific research techniques, or improving discrete academic skills. Such outcomes can be understood as micro academic achievements, representing the step-by-step progress that cumulatively contributes to broader academic growth. As Thu and Tuan noted:

I learned how to read a research article by analysing it step by step. This helped me visualize and understand the theories much more clearly. (Thu)

When studying at RC, I realized that once I became proficient with a method—like Bibliometrics—I was able to guide many other students. Once you truly master a method, the results will come. (Tuan)

Continued use

Academic outcomes not only reinforced participants' motivation but also translated into continued use of microlearning in their subsequent research and teaching practices. Participants consistently reported that successful experiences increased their willingness to adopt microlearning as a strategy in research-related tasks such as micro-writing, proposal development, and project planning, as well as into teaching activities, including student supervision, lesson design, and classroom delivery.

Since I found it effective, I'll just keep using it — there's no need to change much. (Luong)

It really suits me. I've applied it to managing my emotions and planning my work. It's helped me grow as a person and become a lifelong learner. (Anh)

These quotes suggest that this continued use appeared to be grounded in perceived effectiveness and personal fit. Some who were already applying it noted a shift toward becoming more "micro" in their approach over time.

Academic achievements as reinforcers

Academic success functioned not only as an outcome of the training but also as a reinforcing mechanism that strengthened participants' psychological needs and perceived values. In particular, achievements enhanced competence by providing both internal confirmation of ability and external validation through recognition. Participants reported increased confidence following publications and other milestones.

Before achieving any accomplishments, I often doubted my own ability. Once I succeeded and saw that my research competence was recognized, my confidence grew significantly — and my capability developed along with it. (Thu)

Publishing in international journals means my research capability is officially and accurately recognized, which motivates me even more. (Tuan)

This reinforcing effect was evident not only in major achievements but also in micro-level achievements. These gains accumulate gradually through moments such as delivering a presentation, receiving constructive feedback, or earning a small acknowledgment of progress. One participant described such a turning point:

When I presented the details of my research proposal to the coach, that was my 'aha moment,' because it meant I had applied and followed all of the guided steps. And reaching that stage meant receiving my coach's recognition, a confirmation that, 'Okay, this is temporarily fine. It's not perfect yet, but it's acceptable. (Ninh)

In addition, academic accomplishments also enhanced participants' perceived values, particularly intrinsic value, attainment value, and expectancy beliefs. Publishing research fostered a stronger sense of enjoyment and passion for academic work, as participants "realize there are aspects of the topic that can be explored even further, and want to keep discovering them." (Luong). For some, the experience of publishing consolidated their sense of attainment and reaffirmed the personal significance of research as part of their professional identity. Achievements strengthened participants' expectancy beliefs which, in turn, sustained their motivation to keep progressing. Thu reflected: "We need to have expectations to stay motivated to pursue our goals. Once we achieve something, we set higher expectations and keep developing.", indicating a mutually supportive relationship between success and motivation.

Discussion

The present study aimed to unveil junior researchers' perceptions and experiences following their participation in microlearning-based training and coaching in research skills in Vietnam. Guided by SDT and EVT, the study examined how the interaction between psychological needs and perceived values influenced participants' motivation and academic outcomes within a microlearning-based research training environment.

One of the findings of this study is that participants' competence was enhanced through microlearning-based activities. These findings align with microlearning research suggesting that small, manageable learning units enhance perceived competence (Buchem & Hamelmann, 2010; Hug, 2005), while extending existing work by demonstrating how microlearning, when combined with coaching scaffolds, supports the development of a full research workflow. Once learners internalized how to design, analyse, and frame a study, they started to take ownership of tasks. The progression aligns with SDT's assertion that competence serves a precursor to volitional action (Ryan & Deci, 2000). Furthermore, this growing autonomy was not sudden, but gradually developed over time, reflecting an accumulative process of skill acquisition and internalisation.

Microlearning functioned not only as a pedagogical strategy but also as a collective practice that strengthened mutual engagement and collaborative efficiency. This pattern is consistent with communities of practice literature, which emphasises the role of shared practices in sustaining participation and social interaction (Wenger, 1998).

The three basic psychological needs developed in tandem and mutually reinforced one another throughout the microlearning-based program. Competence was cultivated in ways that encouraged autonomy, which in turn further strengthened participants' sense of competence. Both competence and autonomy enhanced feelings of relatedness, which subsequently fed back into this process. This cyclical pattern aligns with Self-Determination Theory's proposition that psychological needs operate interdependently, such that the satisfaction of one enhances the others and collectively sustains internal motivation (Ryan & Deci, 2020). The dynamic interplay among the needs fostered a motivational climate that enabled learners to progress both independently and collaboratively in their research development. Additionally, these findings also resonate with Bandura's (1977) concept of self-efficacy, as participants' increasing confidence in their research capabilities appears to be shaped by mastery experiences and social interaction.

From a Social Cognitive Theory perspective, this reciprocal process may be understood as reflecting how self-efficacy develops through interaction and, in turn, influences other factors.

Participants' perceived values and psychological needs were co-developed and dynamically interconnected, forming a motivational ecosystem in which each construct reinforced the others. From an expectancy–value perspective, attainment value and strong expectancy beliefs strengthened competence, as learners who believed they could succeed invested more effort and used more effective strategies (Schunk, 1991), whereas perceived cost introduced cognitive and emotional barriers. Within psychological needs, competence and relatedness emerged as key drivers of intrinsic value and expectancy beliefs, consistent with SDT's view that mastery experiences and supportive social contexts enhance enjoyment, interest, and confidence (Ryan & Deci, 2020). From a Social Cognitive Theory perspective, this pattern reflects the interaction between learners' beliefs, behaviours, and social context (Bandura, 1977, 1978). Overall, perceived values and psychological needs operated synergistically, shaping a motivational climate that sustained engagement throughout the research training.

Participants reported a range of academic outcomes resulting from their engagement in training and research activities within the RC ecosystem. These accomplishments are consistent with prior microlearning research demonstrating its potential to enhance competencies, performance, and long-term learning outcomes (Taylor & Hung, 2022; Díaz Redondo et al., 2021). The present findings extend this evidence to research skill development, an area previously noted as underexplored (Yao & Ho, 2024; Sawarynski & Baxa, 2019). Such outcomes represent macro academic achievements, encompassing substantial milestones such as completing and publishing research projects, graduating or enrolling in postgraduate programs, and securing scholarships.

Collectively, outcomes emerged as both products and catalysts of the microlearning-based training. Participants attained a range of micro and macro academic achievements. These accomplishments, in turn, reinforced their psychological needs and perceived values, strengthening motivation and confidence. Moreover, the sense of success inspired many junior researchers to continue applying microlearning-based approaches in both their research practice and teaching, sustaining a cycle of ongoing academic growth and professional development.

Toward a Framework of Micro-researching

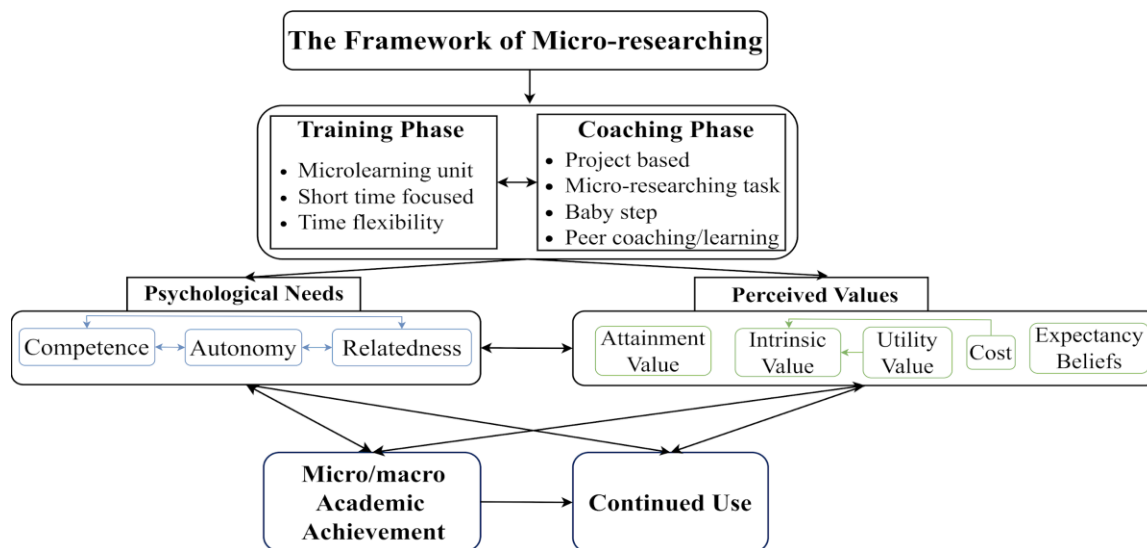
Based on the findings, we propose a new framework, termed micro-researching, which is intended to guide both junior researchers and their supervisors or coaches in working together more effectively. The framework of micro-researching is presented in Figure 3. Supervisors and coaches are encouraged to design structured training and coaching programs for their students and mentees when working on research projects. Within these programs, components and attributes of the microlearning approach should be applied, whereby lessons are divided into microlearning units with specific learning objectives. Where possible, these micro lessons may be recorded as short videos, typically 5–7 minutes in length, and uploaded to learning management systems so that graduate students and junior researchers can learn at their own pace flexibly, anytime and anywhere, via personal devices such as laptops, tablets, and smartphones.

In the framework of micro-researching, learners are not required to complete all lessons on research skills before engaging in a real research project. Instead, they are encouraged to move back and forth between the training phase (i.e., learning micro lessons) and the coaching phase (i.e., conducting actual research with supervisors and mentors). Similar to the training phase, the coaching phase involves learners carrying out micro research tasks in which they can immediately apply the micro lessons they have previously learned. For example, after a micro lesson on the process and principles of data cleaning prior to data analysis, learners may be given an actual dataset and required to apply the knowledge and skills from the micro lesson to clean the data. Subsequently, they can transfer the cleaned dataset to other (senior) research fellows to conduct the data analysis. After completing each micro research task, learners are regarded as having taken a baby step forward.

At the coaching phase, since a graduate student or junior researcher works in a research lab, it's not necessary for him or her to always have to work with the supervisors and mentors. Instead, he or she is suggested to collaborate with and learn from peers also. For instance, a fresh PhD student may collaborate with and learn from a Postdoc fellow about cleaning data techniques instead of from supervisors or mentors.

Figure 3

The Framework of Micro-researching



The above training and coaching process is expected to help a junior researcher to fulfill his or her psychological needs and perceive positive values. Specifically, through small, manageable lessons and task-based practice, learners gradually acquire essential research knowledge and skills. This progression strengthens their sense of competence, autonomy, and relatedness—not only as a direct result of the micro activities but also through the reciprocal development of these psychological components. Learners likewise experience increases in attainment value, intrinsic value, utility value, and expectancy beliefs for success. Psychological needs and perceived values are interconnected and mutually reinforcing. As learners achieve both micro academic accomplishments and macro academic milestones, these successes further enhance their needs

and values over time. Together, these interrelated elements shape learners' intention to continue applying microlearning in their professional research practice.

Conclusion

Microlearning has been widely accepted as an efficient teaching and learning method in diverse educational settings, such as medical education, engineering, information technology and language education (Chamorro-Atalaya et al., 2024; Pham et al., 2024; Qian et al., 2021; Skalka & Drlik, 2020). Nevertheless, to the best of our knowledge, most previous studies have tended to focus on routine and conventional skills; only a few have examined the adoption of microlearning for higher-order cognitive skills, such as research skills for graduate students and junior researchers. This study aims to address this gap by exploring the experiences, perceptions, and responses of 20 graduate students and junior researchers participating in a social sciences training and mentoring program that employs microlearning. Guided by SDT and EVT, this study investigates the extent to which, and the ways in which, microlearning can support junior researchers in engaging step by step in different stages of a research project. In this study, we propose a new framework, termed micro-researching, which is designed to support more effective collaboration between junior researchers and their supervisors or mentors.

Limitations and Future Studies

Like many other studies, this study also bears several limitations. First, its data comes from a single country and only within social sciences which obviously indicates a low level of representatives and comparative perspectives. Thus, future studies are recommended to include samples from other countries than Vietnam and other fields other than social sciences such as humanities or science and engineering fields. Second, this study only adopts a qualitative approach. For more robust results, quantitative and mixed approaches are recommended in order to verify the validity of the framework of micro-researching proposed in this study. Third, although the findings resonate with Social Cognitive Theory (SCT), this perspective was not explicitly integrated into the analytical framework. Participants' increasing confidence in their capacity may also be interpreted through Bandura's concept of self-efficacy and expectations, shaped by mastery experiences and environmental influences. Future research could therefore integrate SCT to better explain how motivation develops and translates into outcomes in microlearning-based environments.

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