



Research article

Doctoral students' English academic writing experiences through metaphor analysis

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ABSTRACT

Doctoral students are expected to contribute to their academic community by presenting their research findings in an internationally acceptable manner and to submit their dissertation. Students from non-English-speaking backgrounds might face challenges when writing publishable papers and dissertations in English. The aim of this study is to explore conceptual metaphors doctoral students used for characterizing their English academic writing experiences during their doctoral studies. A survey was conducted in the spring of 2022 inviting all non-native English-speaking doctoral students. They were asked to finish the sentence: "Writing an academic paper in English is like". A total of 255 doctoral students (125 females; 127 males; 3 not stated) studying at 14 Hungarian universities volunteered to participate. They were from 49 countries and used 52 mother tongues. The metaphor dataset was analyzed following Lakoff and Johnson' (1980) theoretical framework. Ten conceptual domains emerged from the dataset: WORK, TEXT PRODUCTION, CHALLENGE, STRUGGLE, CHANGING PLACES, ACTIVITY, NOURISHMENT, EASY TASK, CONSTRUCTION, and COMPLEX PROCESS. Only four students shared very negative metaphors on their experiences; whereas most students' metaphors reflected optimism, even though they implied various demanding features of English academic writing. Students' metaphors offered new authentic insights into their emic perspectives on their lived experiences.

1. Introduction

A range of publications on various scientific areas pointed out that graduate students were not well-equipped with adequate academic writing skills for writing research papers and dissertations [1–7]. Non-native English speaking (NNES) students get admitted to PhD programs if they meet English proficiency scores on internationally standardized proficiency tests. However, English proficiency test scores do not guarantee that the students have adequate academic writing competence [8], as students from English as a foreign language (EFL) and English as a lingua franca (ELF) contexts have typically not had formal training in academic writing before they enter their degree program [9]. An additional problem concerns the fact that admitted students are not offered developmental courses targeting their English academic writing abilities throughout the program [10]. Bronson [11] stated that the demand to meet the rigors of discipline-based writing is a struggle for many NNES students. Consequently, extensive writing requirements of academic texts mean

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a burden for students [12] and students suffer not only from English language barriers but also from the academic standards they are expected to meet in the programs [13]. As a result, the struggle of trying to meet standards in producing different kinds of academic texts including research proposals, journal articles, reports, conference papers, and a dissertation is hard. As Yugianingrum [14] pointed out, the ability to write good quality academic texts in English is complicated: the challenges students face concern time, finance, environment, facilities, psychological conditions, knowledge and skills in English for academic purposes, especially when students selected a topic, collected adequate and reliable academic sources to support their argument and expressed their ideas in an academic written format. Therefore, the construct of doctoral students' English academic writing (EAW) abilities and skills is complex, and we believe that it is worth exploring what students go through while working on their texts.

Doctoral students studying in Hungary need to accomplish two phases in their PhD programs. In the first phase, they fulfill oral and written course requirements and give oral and submit written progress reports on their literature review and empirical research every semester. In the second phase, they submit papers to conferences and for publication, and write up chapters of their dissertations. These all require a good command of English academic writing skills, and the results depend on the quality of their texts. The ability to write academic papers at a publishable level takes time and extra effort for NNES students in addition to finishing all their research responsibilities.

This study aimed to explore how doctoral students interpret their English academic writing experiences. The paper comprises seven main sections. The introduction provides background of our study. The second part is an overview of the theoretical background to English for academic purposes and metaphor analysis, and a critical presentation of the most relevant empirical studies on EAW that used metaphor analysis. The third section comprises information on the research methodology. The fourth section presents the result of metaphorical data analysis of the current study involving 255 students from 49 countries who shared metaphors on their EAW experiences. In the final sections, the key findings are summarized, and the implications and limitations of the study are outlined, as well as ideas for further research are presented.

The present study fills a gap in published research, as there is hardly any inquiry via metaphor analysis into doctoral students' emic perspectives on their lived experiences as writers in academic English under time pressure. No previous study conducted in Hungary has used a "small lens" [15] to zoom in on doctoral students' cognition and emotions expressed in metaphors. Additionally, no previous study has tapped into international students' EAW experiences during their doctoral journey at universities where English is a lingua franca for students and faculty as well. As the way people perceive the world is shaped by the cultural contexts they belong to, we aim to explore how students' metaphors convey unique cultural images. Findings are hoped to contribute to a better understanding of what the EAW process is like for doctoral students and these insights can inform not only tutors but also students and their peers as to how they can help NNES candidates.

2. Theoretical background

2.1. English for academic purposes

In the course of their education, doctoral students are expected to publish academic papers in English so that they can establish academic careers and contribute to their research field [9,16–18]. Academic writing at the doctoral level "a specialist, theory- and research-informed branch of English language and literacy education" [19], p. 53]. Developing the ability to construct knowledge in disciplined-oriented ways at an internationally accepted level can be challenging for students of non-English speaking backgrounds [20–25].

2.2. What is metaphor?

Traditionally, a metaphor is seen as a literary device used in poetry and people assume that metaphors do not play an important role in their day-to-day life. However, in the book "*Metaphors we live by*", Lakoff and Johnson [26] explained how metaphors play a key role in human cognition by making five claims: (1) a metaphor is not only a linguistic phenomenon, it is also used to allow us to effectively convey concepts we form in our mind; (2) a metaphor is used not only for artistic and rhetorical purposes, it is also used for better understanding and vivid visualization of concepts we would like to convey; (3) a metaphor is often not based on similarity, even though traditionally there should be a resemblance between the two things that people compare by using a metaphor; (4) people need no special talent to be able to use metaphors, everyone can use them effortlessly in their everyday life; and (5) the assumption that people can live without metaphors, as it is just a figure of speech, is wrong, because metaphors are part of an inevitable process of human thought and reasoning. Therefore, metaphors are not only used for comparing features of two entities, but rather for forming meaning out of the interaction of those two features [26]. Thus, metaphors are a source of cognitive priming which helps us elicit semantic, behavioral, and affective responses [26] and they can serve as an essential component of communication, reflecting and connecting the very core schemata of human thought and action 'to carry across' meaning [27]. Kövecses [28] characterized the main features of metaphors as having a source and a target domain with multiple conceptual connections, leading to the creation of some underlying entailments. This is why metaphors can effectively function as a cognitive mediational tool for negotiating meanings and they are powerful in shaping human thoughts. "The people who get to impose their metaphors on the culture get to define what we consider to be true" [26, p. 160]. Therefore, using metaphors helps others see the way we see things, justifying our thoughts and convincing our points of view, thereby making communication more effective [26].

2.3. Metaphor as a research instrument of reflection

Metaphors allow us to (1) express the inexpressible (impressibility), (2) convey complicated abstract concepts that we form in our head successfully (vividness), and (3) transfer all the ideas that we would like to transfer by using a small linguistic package (compactness) [28]. Therefore, metaphors are means of conveying an exact reflection of what we feel and think without lexical limitations; they help us express all that we can imagine, regardless of the question whether it can happen in reality or it really exists [26,27]. Based on the idea that metaphors are efficient representations of self-reflection, metaphor analysis has been used in educational contexts as a research instrument and a thought elicitation technique to discover respondents' innermost beliefs and feelings [29].

As "we learn by reflecting on what has happened" [30], asking students to construct a metaphor on their learning process is a way of providing them with an opportunity for self-reflection [31], p. 238]. explained the process of constructing a metaphor and why metaphors can be used to tap into our inner mind that we ourselves are not aware of: "when we construct a metaphor, we intuitively reach into parts of ourselves that may be beyond our self-awareness". The key role of metaphorical thinking in educational contexts for conceptualizing the learning process is stated by [32], p. 39]: metaphors are widely used in educational discussions and fulfil a variety of functions, such as introducing fresh perspectives, making illuminating comparisons and contrasts, picking out kinds of phenomena not yet named, emphasis, illustration, enlivening dull writing, and many others. As such, metaphors are an integral part of everyday educational narratives.

As metaphors help us describe abstract educational ideas and concepts vividly, eliciting them is effective when students use them to explain what their learning experience is like. Previous research [22,33,34] showed that metaphor analysis allows researchers to understand phenomena from the participants' emic perspectives. Emic data means information supplied by participants [35] and emic refers to "the type of information being reported and written into ethnography when the researcher reports the views of the informants" [35], p. 242]. An additional advantage of metaphor analysis is that it is reliable for "making otherwise unvoiced assumptions explicit" [36], p. 43]. Metaphor analysis can help teachers see things through the eyes of students and it allows them to adjust their instruction, materials and activities to make sure that they offer what the students need and by so doing, the teaching and learning process becomes learner centered [37].

2.4. Empirical studies using metaphor analysis

To ensure that we covered all the directly related studies, we included only studies which explored students' perceptions about writing through metaphor analysis, as this is our narrow focus. We excluded all papers on metaphor analysis focusing on other English skills. Studies published in languages other than English were not considered. Additionally, we did not review studies conducted below the university level, as there is a large gap in terms of age, experience, expertise, writing abilities, family responsibilities, maturity and most importantly, perception of the world between students in public or private schools, versus undergraduate and graduate students. The following are the selection criteria: setting (research conducted at the university level), language of publication (English), focus of study (students' perceptions of EAW or English for Specific Purposes (ESP) or general English writing), transparent methodology, shared data and research findings, and data sources (data obtained from primary sources such as interviews, questionnaires and metaphor elicitation must be one of the data sources), and timeline between 2000 and 2022 to cover recent research. Peer-reviewed publications were searched through electronic search engines using AND OR: "metaphor," "metaphor elicitation," "academic writing," "writing," "ESP," "English for specific academic purposes," "EAP," "writing experience." Seven empirical studies met the above inclusion criteria.

Armstrong [38] investigated seven first-year college students' conceptualizations of academic writing and how they changed over a course at a university in the United States. The authors analyzed metaphors elicited by the prompt ("Academic writing is like") following [26]. The result showed that students had personal models of academic writing, confirming conceptual diversity as well as degrees for conceptual change during their coursework.

Hart [39] explored students' and teachers' changing awareness of their own conceptions of writing. This study was conducted at a university in the US in 2007 with 144 participants (4 teachers and 140 freshmen). The author analyzed the metaphors collected with the prompt ("Writing is like") during discussions and interviews following [38]. The results indicated that the participants gained self-awareness as writers, learned one another's perspective of writing, and experienced a "cracking open" of possibilities regarding their views [39], p. 249].

Paulson and Armstrong [40] investigated 128 students enrolled in university preparation courses on college reading and writing at a university in the US in 2011. The writing metaphors (elicited with the prompt: College writing is like _____. How or why? _____) were analyzed by following the previous literature [26,41]. They found that students' responses covered a variety of conceptualizations.

Wan [42] investigated how metaphors can uncover students' writing beliefs and whether sharing them through metaphors can change individuals' writing beliefs and practices. Seven Chinese students in an MA program at a UK university participated in the study. Metaphors were elicited on (Writing is because) by interviews, observations, field notes and students' written evaluations. The metaphor dataset was analyzed following [38]. The author found that students' writing beliefs could be successfully uncovered through their metaphors. Sharing personal metaphors was found to be helpful for synthesizing writing concepts, increasing self-confidence, improving critical thinking, and formulating plans for writing.

Aydin and Baysan [33] investigated how graduate students expressed their EAW perceptions metaphorically and the kind of EAW experiences students had. The study conducted in Turkey involved 100 graduate students. The data obtained with the help of the task (Academic writing is likebecause) was analyzed descriptively. Metaphors of 44 students who had previous EAW

experiences were conceptually different from one another along nine emerging themes.

Hamouda [37] explored students' writing conceptualizations at a university in Saudi Arabia by asking 77 fourth-year English majors to fill in a metaphor elicitation task ("Learning essay writing is like ... Because ...") and triangulated them with interviews. The majority of metaphors reflected negative, whereas the minority indicated positive attitudes and they were related to three (product, process, genre) approaches to writing.

Pavesi [43] investigated writing conceptualizations of four graduate students studying at a university in Brazil. Metaphors elicited by the prompts ("Writing in Portuguese in Graduate School is like Because ...") and "Writing in English in Graduate School is like ... because") were analyzed following [38], p. 83]. Pavesi found that students expressed their perception through a variety of conceptual metaphors and several repeated conceptual metaphors were found for writing in both Portuguese and English, indicating that students' interpretation of writing process for both languages were similar.

In summary, all seven studies used the same or very similar task to elicit metaphors on what writing in English meant to students at the university level. Findings indicated that metaphor analysis offered new insights into how students experienced writing and the results were integrated into writing pedagogy.

3. Methods

3.1. Research question

What metaphors do doctoral students use to characterize their English academic writing experiences during their PhD studies?

3.2. Participants

The participants were 255 doctoral students (125 females; 127 males; 3 not stated) studying in their respective programs conducted in English at 14 universities in Hungary. They were from 49 countries and used 52 mother tongues. The students studied in 68 PhD programs (year 1 = 36.5%; year 2 = 25%; year 3 = 18%; year 4 = 16.9%; year 5+ = 2%; not mentioned = 1.6%). Their age distribution was as follows: 23–25 (4.8%), 26–30 (33.9%), 31–35 (37%), 36–40 (12.9%), 41–45 (9.2%), 46–50 (1.2%), and 51–55 (0.8%) years, with 0.2% not stated.

3.3. Data collection instrument

A survey was designed to examine how doctoral students studying at Hungarian universities assess their EAW abilities. It included 89 items that focused on their academic English background, their EAW abilities, and knowledge in research methods at the start and at their current point in their PhD studies. The survey also inquired into the external support they received for improving their EAW performance. An open item elicited metaphor: respondents were asked to finish the sentence: "Writing an academic paper in English is like"

3.4. Procedure

All participants volunteered to participate in the survey anonymously. A survey link was created using Google form and the link was sent to all doctoral students studying in English programs in Hungary. The instrument was open between 2/21/2022 and February 4, 2022. All participants were coded to maintain their anonymity and their responses were saved as they entered them; thus, all answers were analyzed and presented in their authentic form, without editing them for spelling or content.

3.5. Data analysis

Elicited metaphors were interpreted as CONCEPTUAL DOMAIN (A) is CONCEPTUAL DOMAIN (B) following Lakoff and Johnson [26]. In this study, CONCEPTUAL DOMAIN (A) was WRITING AN ACADEMIC PAPER IN ENGLISH. Therefore, CONCEPTUAL DOMAINS (B) were grouped under their respective categories emerging from the dataset. Following the literature on analyzing qualitative data, the raw dataset was carefully examined, as this stage is "an opportunity for (us) as a researcher(s) to reflect deeply on the contents and nuances of (our) data and to begin taking ownership of them" [44], p. 81]. This was done in multiple rounds by all three authors to ensure reliability. As a first step, we counted how many valid answers we got; we checked if there were any responses comprising more than one metaphor. Two responses included two metaphors: "traveling in a hot-air balloon. The process is slow, but you acquire new and exciting experiences." and "It's a journey and a process to keep upgrading yourself. The more feedback, the more you get used to writing English articles." The word "process" in both responses was used to support their metaphors "traveling" and "a journey". Therefore, only "traveling" and "journey" were counted as valid metaphors. Some metaphors could have been listed under a different domain and it took multiple reiterations to agree on the final coding.

Then, we categorized all answers into two groups: metaphors and non-metaphors to ensure the validity of the study. We found 42 responses comprising non-metaphorical expressions even though those expressions could clearly express what the students thought their experience was like (e.g., Writing an academic paper in English is like "synthesizing theoretical and practical experience logically and critically"). Responses given by twelve students were found impossible to comprehend and not valid (e.g., Writing an academic paper in English is like "everything else"; Writing an academic paper in English is like "sorry, I could not find any word to complete the

sentence.”). These responses were deleted from the dataset. Eight students did not provide a response. In our data analysis, we included one-word adjectives or short non-metaphorical phrases that effectively convey what the students feel like regarding their experience (e.g., Writing an academic paper in English is like *struggling*; like *so-so*, it is *neither difficult nor easy for me*).

A total of 193 responses comprising metaphors were thoroughly examined to look for “all possible theoretical directions indicated by” our multiple readings of the data [[45], p. 46]. As a next step, the dataset of metaphors was broken down into discrete parts in order to look for similar themes before coding them. According to Saldaña [[46], p. 3], a code is “a word or short phrase that symbolically assigns a summative, salient, essence-capturing, and/or evocative attribute for a portion of language-based or visual data”. After identifying the keywords, we agreed on the ones that correspond to the main themes.

In the step of thematic organization, we reviewed the codes identified in the previous step whenever necessary and re-arranged some codes because these “advanced ways of reorganizing and reanalyzing” can allow researchers to discover “more accurate words or phrases” [[44], p. 149]. By doing so, “conceptually similar codes” can be merged and “infrequent codes can also be assessed for their utility in the overall coding scheme” [[44], p. 89]. Once again, we put similar things under the same themes. At this stage, certain codes which seemed to be good keywords in the first round were dropped, as they seemed redundant after the whole dataset was fully interpreted.

4. Results: metaphors doctoral students used for characterizing their English academic writing experiences during their PhD studies

In order to characterize participants’ lived experiences through their metaphors, the 193 conceptual metaphors were grouped into ten themes that emerged: WORK, TEXT PRODUCTION, CHALLENGE, STRUGGLE, CHANGING PLACES, ACTIVITY, NOURISHMENT, EASY TASK, CONSTRUCTION, and COMPLEX PROCESS. The frequencies of metaphors in the ten conceptual domains are shown in Table 1. First, we present these, and then we analyze each conceptual domain in Tables 2–11.

Thirty-six students believed that academic writing in English for them is work (Table 2). However, their perspectives about the nature of the job to be done are different: 18 respondents interpreted it as REWARDING TASK (they used positive adjectives such as interesting, important, desired), six thought it was like CREATIVE WORK, and 11 students thought it was HARD WORK. One thing in common among these 36 students is that none of them thought that the experience was absolutely negative or impossible to accomplish. They all believed that it was doable even when the work is “stressful,” “hard,” “very tedious,” “tough,” “difficult,” or “hard as digging a hole.” These metaphors indicated that the task was doable.

Students were asked to provide a metaphor to describe their academic experience while they are earning course credits, struggling to get their papers published and writing up their dissertation. Table 3 comprises 25 metaphors in the conceptual domain of TEXT PRODUCTION. Interestingly, four students, whose mother tongues are Spanish, Chinese, Arabic and Azerbaijani, respectively, found that WRITING IN L2 IS LIKE WRITING IN L1. For these students it is logical to infer that L2 writing is not different from writing in L1 due to their practice in both languages. Most probably they mean that the process and challenges in academic writing in L1 and L2 are technically similar as well as equally demanding. It is not English that makes it hard to write publications and a dissertation, but the genre of academic writing, irrespective of the language.

Eight students (Table 3) thought that it is like IDEA TRANSFER onto paper in a required presentable format; it is obvious that they were reflecting on their writing experience as a means of conveying content. One respondent explained the reason why it like idea transfer: “your work and the result for others to benefit from.”

Thirteen students (Table 3) mentioned that WRITING IS WRITING reflecting that the nature of writing is unique itself and difficult to find another equivalent, even though they used different genres of writing in their metaphors. From the metaphors WRITING A BOOK/A FORMAL LETTER we inferred that the characteristics of academic writing are similar to formal requirements related to writing a book or a formal letter, as opposed to writing stories and informal letters. Seven students thought that features of a story and novel are similar to those of EAW, as they are all texts following a prescribed structure, and certain characteristics must be included in them. Therefore, it is relatable that writing an academic text is like story telling. As a student put it, a dissertation has to include all the questions raised. Three students mentioned that EAW is like composing poems, yet another genre with special rules, as the writer must be “very thoughtful yet intriguing.”

Table 1
Ten conceptual categories of metaphorical perceptions of English academic writing (EAW).

Conceptual domains	Frequency (f)	%
WORK	36	18.65
TEXT PRODUCTION	25	12.95
CHALLENGE	24	12.44
STRUGGLE	21	10.88
CHANGING PLACES	20	10.36
ACTIVITY	18	9.33
NOURISHMENT	16	8.29
EASY TASK	14	7.25
CONSTRUCTION	13	6.74
COMPLEX PROCESS	6	3.11
	193	100

Table 2
Findings of the analysis of the WORK metaphor.

Conceptual Domain: WORK (f:36)	Exact words of students' responses
REWARDING TASK	An interesting task the most important task of my day. a good task Spending much efforts to reach success supporting all scientists in society in creating a better world, regardless of nationality. Doing a nice job of tidying the room to collect a coin with different date, and then to compare in order to see the wealth managing a theatre, many things need to be conducted together in order to present a good show. Hard work always has its reward. Project taking a lot of much time to have good results expressing your scientific findings and views to your peers which could help you in developing more critical thinking. helpful tool and indispensable for science.it allows people to study internationally or read the scientific works right after they are published using them when they are necessary in their own researchers. Rainbow Enjoyment now The enjoyable moments of lifegiving a wonderful gift to myself. A dream comes true since my research experiments need months to be able to produce results Giving birth
CREATIVE WORK	carving a statue creating a statue; first the rough shape is molded, followed by shaping the details and finally finetuning it to its final complexion. creating a statue out of clay. It seems easy but needs critical skills Writing an academic paper in English is like indulging into a crafting activity, whereby you would use all of your materials and skills to yield a nicely finished output. an art: it is difficult to master, but once you have the hang of it, it takes only practice. painting an attractive and informative art.
HARD WORK	a stressful work, requiring so much of endurance, determination, and readiness to improving the text one week of hard work a very tedious work, which I do not feel prepared for a tough and detailed work. well organizing a work scenario. similar to creative and completely analytical work, which takes quite a lot of time A difficult job but still possible to do. hard as digging a hole Writing an academic paper in English is like running 5 km. learning how to write in the primary school doing a hardest thing

In sum, it is noticeable that the students whose metaphors belong to this conceptual domain thought about the nature of their EAW as they filled in the metaphorical prompt. As writing up the dissertation to be submitted on time is one of the main doctoral tasks, it is natural that they all thought about it when they expressed what their writing experience is like.

As seen in [Table 4](#), 24 students thought that it was a challenge to write an academic paper in English. It is quite understandable that writing scholarly texts at the doctoral level is tough for students who came from non-English speaking backgrounds, which is best understood in the metaphor “forcing your foreign language knowledge to its limits.” As is shown in [Table 4](#), 22 students used the exact word “challenge,” and only two respondents expressed the idea in other words: the above response mentioning their limits and the last metaphor evoking the first time they drove a car, clearly describe the cognitively challenging situation students find themselves in.

Twenty-one students ([Table 5](#)) described their experience in overwhelmingly negative terms as unpleasant: a STRUGGLE. It was obvious that they had to struggle in order to produce scholarly texts at the expected level; however, they also understood that it was a necessary evil they had to overcome. The metaphors they used ranged between extreme negative images of torture, the Biblical hell, evil, and struggle, to a humorous metaphor softening the edge of the struggle: “Searching (for) a penguin in the desert.” Anxiety is present not only in the metaphors related to the above examples, but also in the unusual image of the “effect of fertilizer on sweet corn”, merging climate anxiety with writing anxiety.

[Table 6](#) presents 20 metaphors of two types comprising the conceptual domain of CHANGING PLACES. Ten students wrote that writing an academic paper in English was like moving from one place to another, towards a clear goal from their current point. Their metaphors were not the same. Even though the adjectives they used to modify meaning were different (e.g., “never-ending,” “long,” “of the risks,” “enjoyable”), they all implied that their journey took time and they had to work hard. The other ten students' metaphors included not only moving forward but also moving upwards, like an uphill struggle. They interpreted their experience as a process of going upward which enables them to enjoy a bird's eye view, even though it might be tiring, without Sherpas, and full of setbacks. The adjectives they used (new, highly rewarding, exciting) indicated that they also appreciated the beautiful side of their experience, clearly indicating mastery motives.

In [Table 7](#), all metaphors are related to an activity: two out of 21 students described their experience as a roller-coaster ride emphasizing that it is full of ups and downs, making them thrilled, excited, and scared reflecting mixed emotions. Another two students

Table 3
Findings of the analysis of the TEXT PRODUCTION metaphor.

Conceptual Domain: TEXT PRODUCTION (f: 25)	Exact words of the students' response
WRITING IN L1 IS WRITING IN L2.	writing in my language now writing it in Chinese. writing in your own language because you need to understand what you want to mean when you write writing a paper in my own language
IDEA TRANSFER	Transferring our knowledge into a paper Transfer your ideas to the world in one unified language dedicated to science. Putting down in words your work and results for others to see and benefit from translate my thoughts to paper, making it clearer for the reader. Writing an academic paper in English is like expressing your dreams and thoughts into reality. An information which is clear, concise, focused, structured and backed up by evidence, to make it understandable to a wider group of people Being coherent throughout the paper. It's more about the structured argument than delivering a vague statement convincing the people who already know what you are saying, but act as if they do not understand
WRITING IS WRITING	WRITING IS WRITING
WRITING A BOOK	Writing a book Writing a book, it has been engaging but at the same time informative
WRITING A FORMAL LETTER	writing a formal letter
WRITING/TELLING A STORY	writing an interesting story, fun and challenging writing a story is like narrating a story to a child. It must have the answers to all their questions. Telling a story telling a story, it needs introduction with ambiguous questions/problem and methodology then how the method(s) is/are helping for solving the problem. problem and methodology then how the method(s) is/are helping for solving the problem. telling a story.
WRITING A POEM	write a novel writing a poem; you need to be very thoughtful yet intriguing composing poetry. writing a poem

Table 4
Findings of the analysis of the CHALLENGE metaphor.

Conceptual Domain: CHALLENGE (f:24)	Exact words of students' responses
	challenging activity it is very challenges, because we should read a lot of references to improve our information Challenging Pretty challenging, but very creative and exiting for me as a young researcher A challenging task yet it is enjoyable to finish. really difficult task that requires a good command of the English language because of not being a native English speaker, this task is more challenging even though I have studied English and I teach it for several years. challenge. I am not so good in English, therefore I mostly write and publish in Hungarian. In case of English papers, I write it in Hungarian and translate in English them. I would take too much effort to write them in English properly. A challenging task. possible and challenging A challenge with ups and downs a big challenge to someone starting his first year in English a real challenge for me a challenge which will be criticized no matter how good it is writing an academic paper in English is like a hard challenge for me. Since I am not only struggling on my academic subject but also with the grammar. It is still challenging for me. Overcoming a challenge challenging. Challenging Challenging Challenging forcing your foreign language knowledge to its limits. driving a car after getting your first license

thought that EAW was adventurous, indicating that they were aware of both sides of an adventure: the opportunities to discover new things and the risks one might face if not well prepared.

Seven students' metaphors referred to rule-based activities, highlighting the fact that they understand that they must follow strict rules if they want to be able to actively participate in those activities. Some of these rule-governed activities in the metaphors were

Table 5
Findings of the analysis of the STRUGGLE metaphor.

Conceptual Domain: STRUGGLE (f: 21)	The exact words of students' response
TORTURE	A torture A nightmare. A hell Hell: ((
IMPOSSIBLE MISSION	Searching a penguin in the desert. playing ping-pong against an invisible building a Jenga tower under a wooden bridge using fishes that can only be caught in fresh water from 6 a.m. to 7 p.m. in fall. Mission impossible
SUFFERING	bathing in ice-cold water during winter Walking on a hot beach sand without slippers Struggling Struggling trying to not sink with the ship. Riding a bike on a steep slope which is really tiring
BURDEN	a burden for me. I do not like it even tough, i am good at it.
ANXIETY	having a nod in my stomach, but not because of English but overall anxiety about sending it to my supervisor and trying to publish it
NECESSARY EVIL	a necessary evil we must overcome A small surgery the effect of fertilizer on sweet corn eating bitter medicine

Table 6
Findings of the analysis of the CHANGING PLACES metaphor.

Conceptual domain: CHANGING PLACES (f:20)	Exact words of the students' responses
JOURNEY	It's a journey and a process to keep upgrading yourself. The more feedback, the more you get used to writing English articles. Writing an academic paper in English is like a never-ending journey. A journey A long journey going on a business trip to an exotic place. You must work hard and put in a lot of effort but it's enjoyable at the same time. Alice in Wonderland but instead of Wonderland you enter a world of never-ending references and paper requirements. Going out in nature as I will enjoy the journey but should be aware of the risks that may face me. A journey to a jungle Walking in the jungle finding the right track to the desired destination.
UPWARDS MOVEMENT	traveling in a hot-air balloon. The process is slow, but you acquire new and exciting experiences flying a kite in an open blue sky climbing a tree, the higher you get the more perspective you have on your research area on respective climbing a mountain. It is tiring but in the end, it is highly rewarding. On the way up, there will be parts that you'll enjoy and there will be points where you are about to give up. climbing a mountain: even with the right equipment and training, it is slow in progress and full of setbacks. climbing Mount Everest without sherpas. a mountain to climb. a mountain climb a mountaineer who tries to climb for days. climb a high mountain

simplistic (e.g., knitting), whereas others were highly complex and cognitively (chess) or physically (marathon) extremely demanding.

Then, seven out of 21 students' metaphors concerned an exam, an investigation, a quest, and developing a new skill; all of these activities have a clear goal. In addition, they all include a prescribed sequence of steps, which may be known or unknown at the beginning of the activity. The activities chosen by the students (riding a bicycle, driving a car, playing a sport, taking an exam, performing investigation, and following on a quest) imply that they realized that academic writing requires practice and training. In most of these responses, although the respondents used different metaphors to describe their experience, they had one thing in common: they were quite positive in terms of describing their academic writing experience. These metaphors implied that all activities required concentration (even the roller-coaster) and efforts to make progress in academic writing.

Sixteen students' metaphors in Table 8 indicated that their academic writing experience was like getting some sort of nourishment, eating and drinking something that nourishes their body. Three students added adjectives to describe the taste of food as "spicy," "not sweetie not salty but between"; however, all of these students seemed to understand that spicy and unusual combinations of flavors can be enjoyable, delicious, and interesting. In all, 5 out of the 16 metaphors implied that academic writing was like preparing food to serve

Table 7

Findings of the analysis of the ACTIVITY metaphor.

Conceptual Domain: ACITVITY (f:18)	Exact words of students' responses
CONSTANT UPS AND DOWNS	A roller-coaster of emotions. At the end, you either hate it or love it. Rollercoaster
ADVENTUROUS ACTIVITY	an adventure an Adventure
RULE-BASED ACTIVITY	knitting patterns a game Playing chess, which easy to start but hard to win. professional sport, takes a lot of dedication and practice, however from time to time you also need a bit of luck. Marathon. Slow and steady win the race Driving driving a bicycle
GOAL-ORIENTED ACTIVITY	taking an exam an investigation pass complicated but interesting quest Writing an academic paper in English is like learning new skill. We need to practice on it then we will get used of it. learning how to walk for the first time. going to the farm with the appropriate farm tools Fruit growing

Table 8

Findings of the analysis of the NOURISHMENT metaphor.

Conceptual Domain: NOURISHMENT (f: 16)	Exact words of the students' response
	eating a piece of cake Eating my dinner eating a French toast in the morning. Having my breakfast every morning. Apple something not sweetie not salty but between Eating spicy food, it is delicious but it makes you suffer a cup of tea for me. going out for coffee Cup of tea drinking a glass of water. cooking a kind of food that you have never tasted before Cooking your favorite dish, where you know that the time and effort will not go for waste. cooking because the writer needs to check all the language components and the contents, text organization, coherence, mechanics, texts' readers, etc. Then, the writer has to edit, revise, and have proof readers to give any feedback. preparing our favorite cake recipe. serving a good meal on table that the guest(s) can enjoy!

Table 9

Findings of the analysis of the EASY TASK metaphor.

Conceptual Domain: EASY TASK (f:14)	Exact words of students' response
	A piece of cake a piece of cake. A piece of cake if you have good results and ongoing progress. That can be done with the continuous cooperation with your supervisor Piece of cake normal a normal task because I only know to write a paper in English and not in any other language but striving too as it deals with a lot of correctly researched fact those are crosschecked extensively. Norm For now it is not that difficult Easy no big deal so-so. It's neither difficult nor easy for me. Easy if you have a mentor doing a simple task for me Breathing

Table 10
Findings of the analysis of the CONSTRUCTION metaphor.

Conceptual Domain: CONSTRUCTION (f:13)	Exact words of students' responses
BUILD FOLLOWING PLAN	trying to put a mosaic together: One is working with a large number of sources that are related to varying extents, yet they need to be made into a coherent and pleasing whole. building a LEGO house erecting building blocks. building a structure, requires planning, well-shaped blocks, and strong bonds. Take a machine apart and put it back together. building a house where I work on every detail thoroughly with careful consideration. constricting a beautiful house. building a house Building a new house from scattering bricks building a new house Building a house. building a ship

Table 11
Findings of the analysis of the COMPLEX PROCESS metaphor.

Conceptual Domain: COMPLEX PROCESS (f:6)	Exact words of students' responses
	a never-ending process It is a process with its ups and downs. a non-ending process of rewriting process. a very slow process with many windows open on the computer the process of perfecting own abilities.

something delicious at the end of a series of preparations. The metaphors offered by these 16 students indicated that their academic writing experience was not a waste of time for them, as it would result in something nourishing and delicious for whoever their target audience will be.

Table 9 shows that 14 students' metaphors conceptualized academic writing in English as something that was not very demanding but as an easy task. Five respondents used the metaphor of a piece of cake, while others said it was a normal or enjoyable task. One respondent used the word "breathing" as a metaphor to highlight that EAW was just a normal part of human life.

Table 10 comprises 13 students' metaphors comparing their experiences to building something by following a clear blueprint. Seven of them clearly stated the desirable result of their building process: a house to live in (six students) and a ship to sail across the ocean (one student).

As seen in Table 11, six students conceptualized the construct of EAW as a process; two responses used positive adjectives (*with its ups, leading to perfection*). These students recognized key characteristics of writing an academic paper in English: tedious and slow. It is also noticeable that students did not think of it as a completely negative experience, even though one of them used *never ending*. They used words that describe the lengthy nature of creating academic texts. The noun phrase "a very slow process with many windows open on the computer" visualized the lived experience of what using a word processor means in the life of a doctoral student.

As the data in the tables indicate, it is thought-provoking to explore students' perceptions of their EAW experience closely: they reveal their beliefs about their own and other stakeholders' role and identity. For example, one of the students mentioned that writing was like *narrating a story to child*. *It must have the answers to all their questions*, whereas another one said that it is like *convincing the people who already know what you are saying but act as if they do not understand* to explain the same process of EAW (Table 3). Their perceptions about their own roles and those of their audience (committee members of their dissertation) were different: in the first example, the audience is like a child knowing nothing, so they must explain everything in detail; in the other one, the student believed that the audience already knew everything.

5. Discussion

The sample size (255 respondents) in the current study was much larger than in any of the previous inquiries eliciting metaphors on EAW. In previous publications the number of participants ranged between fewer than 10 (four in Ref. [43]; seven in Ref. [38]; and [42] and 140 [39]. More specifically, the two publications involving graduate students analyzed data collected from four [43] and 100 respondents [33].

The participants in the current study wrote a variety of metaphors conveying different shades of interpretation regarding their EAW experiences in ten conceptual domains: WORK, TEXT PRODUCTION, CHALLENGE, STRUGGLE, CHANGING PLACES, ACTIVITY, NOURISHMENT, EASY TASK, CONSTRUCTION, and COMPLEX PROCESS. Overall, we did not find all the exact metaphorical expressions mentioned in previous studies; however, all the metaphorical conceptual domains that emerged in this study were also mentioned in previous analyses in other contexts [33,37–40,42,43]. This outcome offers evidence that the study is valid, as the findings are in line with previous inquiries conducted with undergraduate and graduate participants. Additionally, the results in the current

study reflect the special difficulties students face in academic contexts where English is a lingua franca in the literature [21,22,24,25, 47–54].

Certain metaphors in our study were unique and not found in other publications. For example, the idiosyncratic metaphor *building a Jenga tower under a wooden bridge using fishes that can only be caught in fresh water from 6 a.m. to 7 p.m. in fall* was not only humorous but also creative, reflecting the highly constrained characteristics of academic writing. This was the first time we heard of this Vietnamese game. There are other unique metaphors in our dataset, for example, the ones related to *searching for a penguin in the desert* and *bathing in ice-cold water in winter*.

Only one out of 255 students used *rainbow* as a metaphor in our study. It is widely accepted that a *rainbow* is a wonderful natural phenomenon, and it represents a virtuous quality. Interestingly, the metaphor of *rainbow* was used to represent writing experiences in other studies (e.g., Refs. [33,37]). Similarly, in our dataset, only one respondent wrote *knitting*, whereas it was mentioned in Ref. [37]. Several students in the current study wrote metaphors on cooking, consuming and preparing food, and drinks to represent their EAW experience. One student used a particular taste as a metaphor: *something not sweetie not salty but between*. Flavors were also among metaphors to explain what EAW is like in other studies [33,37].

All participants in this study shared certain characteristics of the educational context as they all pursued their research degrees in the doctoral education system of Hungary; however, we found no specific reference to the local context. They were all non-native users of English, which may explain why 12 responses were unclear and 42 answers were not categorized as metaphors. All respondents could be assumed to have gone through the same admission protocols and procedures of fulfilling their doctoral tasks to meet requirements of course credits, publication credits, and research credits in their respective PhD programs. The metaphor dataset showed that the ways participants made sense of what they had experienced varied. Even when their personal metaphor is grouped under a large conceptual domain along with those of others', the underlying factor for their choice of metaphor is unique. For example, the metaphor *servicing a good meal on the table that the guest(s) can enjoy!* is close in meaning to the metaphor *preparing food*; however, it was clear that the students expected their work to be valuable enough to benefit the readers (the guests). This indicates that their intention is to make a valuable contribution to their academic community. Similarly, a student mentioned that their academic writing in English is like *a burden*, which may imply that their abilities in EAW are limited; however, the reason why the respondent chose this metaphor (*a burden*) was not the limitations in their EAW abilities (*"I do not like it even though, I am good at it."*). This could be interpreted as the student's facilitating anxiety leading to better performance. Overall, the metaphor analysis showed that students were confident about their abilities, although not all enjoyed the process, or were pleased with their experiences. This general result is in line with the quantitative analysis of the questionnaire data [55]: students' self-assessed scores on their EAW ability at the current point of their PhD studies ($M = 4.7$, $SD = 0.96$) was higher than the scores of their EAW ability at the start of their PhD ($M = 3.06$, $SD = 1.42$).

An additional remarkable finding is that only four students gave metaphors with extreme negative connotations (e.g., torture, nightmare, hell). Although the exact metaphor of *hell* was not found in any of the seven reviewed studies, *nightmare* had a similar connotation in Refs. [33,37] and *torture* was found in Ref. [37]. There are other metaphors that also convey negative meaning, they concerned the EAW experience throughout the PhD program. For example, the metaphor "trying to not sink with the ship" offers a vivid picture of what it is like to struggle as a non-native-English-speaking student in a publish or perish situation (similarly to the complex challenge reported in the Jenga tower metaphor). The metaphors we analyzed in this study offer new knowledge on students' cognition, emotions, and other aspects of their lived experiences as doctoral students writing academic texts in English.

6. Conclusions and implications

In sum, we found that most students' metaphors offered important insights into their lived experiences related to EAW. Apart from four negative examples, the wide range of metaphors represent the complexity of students' perceptions, ranging from positive, creative, and humorous images to more demanding and challenging aspects of the EAW process for graduate students who use English as a lingua franca. The conceptual domains and the metaphors of English academic writing in the present study are in line with the findings of previous inquiries conducted in other educational contexts [33,37–40,42,43], but some unique ones were also found. They all offer vivid insights into the emic perspectives of the students' lived EAW experiences. Moreover, the results underpin the claim that metaphors can explain unfamiliar and abstract concepts and ideas of educational phenomena when used as a research instrument in educational contexts [56].

The implications of the exploratory study are manifold. Metaphor analysis, a well-established type of inquiry, is a useful way of investigating how students perceive their English academic writing experiences. Even though metaphor analysis does not have a direct link to solving problems or therapy, this kind of exploration can help diagnose problems. It is important to understand students' thoughts and feelings, as they impact not only how they write, but also how good their texts can be. We believe that stakeholders (supervisors, professors and other doctoral students) can gain important insights from metaphor analysis to understand what it is like to write publishable texts in English, how to support NNES candidates and how peers can scaffold one another in the learning process. Academic writing courses are not likely to be offered in all PhD programs. However, the experiences of these students in the study clearly indicate that many would benefit from an EAW course as part of their studies.

7. Limitations and suggestions for further research

The dataset of metaphors in this study came from a convenience sample of 255 doctoral students studying in Hungary in the academic year of 2021–2022. The analysis is based on the responses of volunteers; therefore, despite the largest sample size among the studies eliciting metaphors on EAW, the results cannot be generalized to all other doctoral students in the country, let alone to graduate

students in other contexts. All respondents were non-native speakers of English. Their interpretation of their EAW experiences may not reflect the experiences of doctoral students using English as their first language. The study was cross-sectional; therefore, it cannot reveal how students' perceptions changed over time.

Further studies are needed to examine graduate students' EAW experiences through metaphors in other educational contexts. It would also be useful to explore how metaphors could be utilized in tasks in EAW courses. Such studies could reveal how students can benefit from working with metaphors representing other novice authors' emic perspectives and raise their awareness towards what EAW feels like and what strategies might be helpful to overcome challenges and to maintain engagement with academic writing tasks. Longitudinal studies could reveal how metaphors change over time and how they reflect students' development in their EAW as well as coping strategies. Such feedback data could be helpful as diagnostic assessment. Finally, metaphor analysis can be used for triangulation of datasets gained with other instruments.

Author contribution statement

Wai Mar Phyo: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Nikolov Marianne; Ágnes Hódi: Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

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Data availability statement

Data included in article/supp. material/referenced in article.

Declaration of interest's statement

The authors declare no conflict of interest.

Appendix A. Supplementary data

Supplementary data related to this article can be found at <https://doi.org/10.1016/j.heliyon.2023.e13293>.

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