

Terminological Problems in Academic Writing: A Study of Texts Written by University Students

Heli Katajamäki
Language Centre Linginno
University of Vaasa

This study focuses on terminological problems, which students encounter in academic writing. In the academic writing course Academic Writing in Finnish (5 ECTS), students perform an argumentation analysis, which is reported by writing a short academic text, called a mini-thesis. For the argumentation analysis, students analyse a Master's thesis written by some other student based on the theoretical background given during the course. In this paper I will describe terminological problems encountered by ten students in this task. The aim is to illustrate that students may have a conceptual understanding of the concepts (argument, main claim, claim, reason, background assumption) required for the assignment but still resort to using term-like words vaguely, ambiguously or sometimes even wrongly. The results of a genre and discourse analysis show that this is the case in some respects. Terminological problems illustrate how the terminological chain from the sources of the assignment to the assignment and further to the mini-thesis might be broken, and as a consequence, the intelligibility of the mini-thesis can be put at risk. However, some students use the term-like words consistently and even show some development if compared with the terms given in the theoretical background. The results may have pedagogical use in shedding light on how consistent use of terms strengthens intelligibility.

Keywords: academic writing, mini-thesis, terminological problems, term-like words, genre chain

1 Introduction

For novices, such as university students, academic writing is a challenge, because they are just getting acquainted with the genres, their structure, functions and linguistic features (see Swales 1990). Besides learning what types of genres they need to master, the university students acquire domain specific knowledge, including new concepts and terms, which is a demanding task (see Evergreen, Cooper & Loughran 2016). Concepts can be defined as items of knowledge within special subject fields, whereas terms are linguistic expressions that designate specialized concepts (Nuopponen 2003; L'Homme 2020: 5). Even though field-specific concepts and terms might be harmonized to a degree in some subject fields, it should be pointed out that scientific knowledge is not or does not strive to be monotonous, but rather diversified and progressing, and thus, concepts and terms evolve continuously in accordance with the process (see Pyritz, King & Sueur 2011; Myers 2018). Moreover, university studies as a whole, and often also individual courses, strive to give the students a rather holistic and diversified view of how the phenomena are approached. However, there are often a lot of new concepts and terms to learn in a short time, so even though they would be used consistently during a university course and an assignment is given on this subject, students might still show a lack of terminological accuracy and consistency in their texts.

The aim of this paper is to describe how students' choices of words in a written assignment correspond, or do not correspond, to the terms they have been taught during the

course to be used as a basis for the assignment. Thus, this study sheds light on the types of terminological problems that appear when students try to cope with terms and concepts at least partly unfamiliar to them. Terminological problems can be viewed as signs of indeterminacy in language use, which has quite recently been acknowledged as a useful starting point in LSP studies and in new approaches within terminology (Antia 2007: 15; L’Homme 2020: 18). Such problems can be used as a starting point for studying texts from the terminological point of view (see Andersen 2007; Rogers 2007). The results of this study can be used for developing teaching, e.g. to illustrate to students the idea and purpose of terminological clarity in scientific and professional contexts.

This study represents the field of Language for Special Purposes (LSP). In LSP studies, variation in language use within a subject-field is in general explained using three factors: ontological-epistemic variation, which is connected to the field, functional variation, which is connected to the purpose of language use and social variation, which is connected to the audience (Koskela & Isohella 2018). In LSP studies, the focus is on the language use of experts for whom the standardization of communication in specific fields is a preference. In this study, by contrast, I focus on novices’ language use. Moreover, in this study, the subject field in question, the purpose of the text and the audience are treated as constant factors. This again leaves the writers, that is, the students at different stages of the learning process, as the most plausible source of variety. Through the variety of their language use, this study sheds light on different kinds of writing abilities of students, but also reveals strengths and weaknesses in teaching and provides ideas for developing it. Therefore, this study also represents research of teaching in higher education. For example, Duff (2010: 170) states that finding effective ways to support students in adopting the discourse practices of their academic communities needs to be studied further.

Theoretically, this study approaches language use in academic writing through the lenses of **genre studies** (Swales 1990; Duff 2010), the lenses of **discourse analysis** (Martin & White 2005) and **traditional terminology research** (Wright & Budin 1997; Nuopponen 2003). Firstly, genre studies provide the theoretical frame for approaching students’ academic writing as social activity occurring within a discourse community. Secondly, discourse studies provide a background for illustrating how the language is used. Thirdly, traditional terminology research provides a background that sets a theoretical frame for language use in professional communities, highlighting the importance of using accurate terminology for communicating expert knowledge (see L’Homme 2020: 7–11).

2 The Use of Special Language in a Scientific Discourse Community

Academic writing can be approached as a social activity of a scientific discourse community. The term *scientific discourse community* refers to people who are united through writing and reading texts within a subject/disciplinary field. In discourse communities, texts representing certain genres are written based on conventions that tend to restrict linguistic choices. Writers must adapt to the social role of scholars, including their values, ideologies and norms, and write as is expected of them. In order to do this, academic writers need to gain genre knowledge through participating in their field’s knowledge-producing activities (Swales 1990; Berkenkotter & Huckin 1993; Hyland 2002; Tardy 2009).

In discipline-specific scientific discourse communities, the use of a special language is a resource for maintaining the production of knowledge. The term *special language* refers to language patterns used by experts of a field and includes, among others, lexico-grammatical patterns, such as terms and grammatical metaphors (Antia 2007: 13–14; Martin & White 2005: 33–35; Hao 2020). In terminology studies, such as Laurén and Nordman (1987: cp. 3), narrowing down the disciplinary field to be analysed, is described with the terms *technolect*, *minilect* and *microlect*. A special language, such as the language of one professional discipline, can be divided into technolects based on restrictions of the semantic content (or field of knowledge) and the use of terms and words in texts. With the same criteria, a technolect can be divided according to smaller sub-fields into minilects, often used by a small group, or even further into microlects (Laurén & Nordman 1987: cp. 3).

Each scientific discourse community is governed by its expert members, as they have the power to maintain or change the established discourse practices. Unlike expert members of academic discourse communities, university students are novices who study to become members of a discourse community (Swales 1990). Socialization into academic communities means learning how to participate successfully in the different practices of the discourse community. It means adapting to a social position from which a student is capable of creating an authorial identity that is appreciated and convincing within the community (Hyland 2002; Duff 2010: 169–170; Katajamäki & Koskela 2018). While the use of a special language in order to maintain the production of knowledge carries the ideational (referential) function of language, it also has other functions. The use of special language also carries on the interpersonal function via “the meanings of involvement”, and thus it is an essential tool for enforcing one’s affiliation into the discourse community (Martin & White 2005: 33–35).

In discourse analysis, language use is approached as a contextual phenomenon, and as such, academic texts written by students belong to the context of a university course, including teaching, assignments and other course work. However, academic texts are also a part of an institutional setting. Beside this, words and utterances used in texts are parts of the discourse of a specific field (Fairclough 1992). The concept of **intertextuality** can be used to describe how meanings in a text are contextual and connected to texts written before. The cases in which the meanings in a text are explicitly linked with other texts, represent the so-called *manifest intertextuality*. Unlike manifest intertextuality, *interdiscursivity* is implicit, with no marked traces of another text in a text (Fairclough 1992; Solin 2001). As all words in texts are intertextually connected with previous texts, tracking all connections is not possible. However, when intertextuality is not manifest, tracking it is possible for example by comparing a text with texts belonging to the same genre chain (Katajamäki 2009). The term *genre chain* refers to texts that are known to be linked together in some context (Swales 2004: 18). In addition, as parts of the text, meanings are not only contextual, but also cotextual. Thus, also terms as designations of a concept are tied together cohesively within a text (see Rogers 2007).

Whereas discourse analysis is focused on interpreting language use that construes meanings in each situation, terminology research approaches language use from the point of view of concepts (Nuopponen 2003). In other words, while discourse analysis is based on

a socio-constructionist approach theory of knowledge, terminology research follows a cognitive approach. Nuopponen (2003: 225) defines concepts as follows: “units of thought formed by abstraction, or as units of knowledge. Concepts consist of *characteristics* based on properties observed in a (material or immaterial) *object* or in its relation to other objects.” Concepts are defined based the characteristics of the concepts, and defined concepts generally are designated by terms. Concepts exist as part of concept systems, in which concepts are not distinct elements but related to each other. (Nuopponen 2003) Concepts within concept systems are differentiated from each other based on their **intension** (the set of characteristics that constitutes the concept) and their **extension** (the totality of the objects to which the concept refers) of concepts (Nuopponen 1994: 62–63; Wright & Budin 1997: 339).

Synonymy is seen as a relationship between terms (here: linguistic designations) referring to the same concept in a language. **Polysemy** again is defined as a relationship between a term (linguistic designations) in a language and a concept in situations, in which the same term refers to two or several concepts that have some common concept characteristics. **Homonymy** is a relationship of terms (linguistic designations) and concepts, where two or more similar linguistic designations refer to different concepts. (TSK 2020) In terminology research, total synonymy is seen as possible, unlike in semiotics, which sees synonymy as a gradable phenomenon. In terminology research, synonymy and polysemy are approached by analysing differences between concepts, while in semantics the point of departure lies in words and their meanings. However, only in terminology research are synonymy and polysemy approached from the point of view of looking for unanimous views of how the concepts should be defined and terms used, so that language use is as precise as possible (Nissilä & Nuopponen 2013: 246; L’Homme 2020: 11, 17, 152–153.). In terminology research, concepts and terms are approached from the perspective of professional and scientific communities. From this perspective, referring to a concept by using other words than the expected term could in certain contexts be viewed as unprofessional use of language. This means for example, according to Rogers (2007: 16), avoiding the use of synonyms or hyponyms, because: “for every textual reference in a particular text to a particular object or a representation of a standardised set of objects in the real world, we might expect the same linguistic or non-linguistic signifier”. An opposite of precise language use might be indeterminacy, if words (lexical items) in texts are used in a vague or ambiguous manner. Andersen (2007: 5) defines vagueness as the difficulty of determining the extension of the term, and if this is the case, deciding if a referent or object should be included in its extensional class as a member or not also poses problems. Ambiguity is in question when a term has two or more extensions which exclude each other, but can be in many cases interpreted based on context and domain specific knowledge (Andersen 2007: 5). Andersen (2002) treats homonymy and polysemy as types of ambiguity.

3 The Context, Data and Methodology

In this paper, I describe terminological problems encountered by students within a text written on a course *Academic Writing in Finnish* (5 ECTS) at the University of Vaasa. As part of the course, students have an assignment where they report the analysis of argumentation. Argumentation analysis is a text analysis aiming at identifying, based on the

content of a text, the main claim and how it is justified. In the instructions for the assignment, students are asked to analyse the argumentation of an accepted Master's thesis written by some other student in the same discipline. Based on the argumentation analysis, students write a short (2–3 pages) academic text, called a *mini-thesis*. The communicative function of the mini-thesis is to report the argumentation analysis of a Master's thesis based on the theoretical background given in the course. Moreover, it is expected that in the genre of mini-thesis, a student is able follow the conventions of the genre, such as the thesis structure (IMARD) explained at the beginning of the course, and scientific language, such as accuracy and consistency (see Rogers 2007: 16; Tardy 2009). Pedagogically, the analysis assignment is based on the ideas of constructivism as it combines learning by analysing (reading analytically) and writing. The learning outcomes are set to be increased awareness of argumentation and how it is produced through language use, and in this way, to achieve the attainment of metacognitive genre knowledge (including genre and language awareness) and, through these, the student's personal development as an academic writer (see Negretti & Kuteeva 2011; Katajamäki 2020).

At first, the students were asked to familiarize themselves with the requirements for the argumentation analysis as well as with the theoretical background which provides its conceptual framework. The requirements were given in a video lecture and in the form of PowerPoint slides. In order to do the argument analysis, the students were given the following theoretical background: At a general level, **an argument** (*argumentti*) is defined as the combination of **a claim** (*väite*), **a reason** (*perustelu*) and **a background assumption** (*taustaoletus*). A claim states what proposition is being set forth to be verified, a reason justifies a claim, and a background assumption acts as a link between the claim and the reason, explaining in what way the reason supports the claim. In the analysis of argumentation, the aim is to identify the main claim. The main claim in an analysed text is the claim that is justified by reasons that are given, but does not itself function as a reason for any other claim in the text. Each reason might nonetheless be a claim in its own right which in turn is justified in the text. At first, the reasons are more believable than the claim. Thus, other claims (but not the main claim) are something that are justified by reasons but also can function as being a reason for other claims. In conclusion, the terminology is changeable depending on whether it is approached at a general level or aiming at identifying the main claim, and the terms *claim* and *reason* are polysemous. This terminologically unideal situation (see Nuopponen 2003) is at least partly solved in Kakkuri-Knuuttila (2007: 100), in which a claim that functions simultaneously as both 'claim' and 'reason' is named as *a middle claim* (*väliväite*) and a reason that functions as both 'reason' and 'claim' is named as *a middle reason* (*väliperustelu*). Unfortunately, these two terms were not given to the students in the course materials. However, even when not explicitly stated, university students are permitted to develop the theoretical frame by adding concepts and terms and altering something by themselves. In these cases, students should report if they have done any theoretical development and define the added or altered concepts. However, this is out of the scope of the course's learning outcome, and the highest grade (5) is achievable by using the given theoretical frame and applying it to the analysis.

In this study, I concentrate on the core concepts and terms of the theoretical framework that form the basis for analysing the texts and reporting within the mini-theses. The terms

introduced to the students within this course context can be viewed as a part of a microlect that sets the conventions for the use of concepts and terms, even though the presentation of the theoretical background and the discussion of terms and concepts are brief. However, when approached from a terminological point of view, the core words the students use in their texts might not be classified as terms, especially if they are not treated as such. Thus, I use the term *term-like words* to refer to the words used by students¹. The variety of uses of term-like words offers a possibility to illustrate how the lexical chain – consisting of term-like words trying to refer to an object (see Rogers 2007: 17) – from the sources of the assignment to the assignment and further to the mini-thesis might be broken, and how as a consequence, the intelligibility of the mini-thesis can be put to at risk.

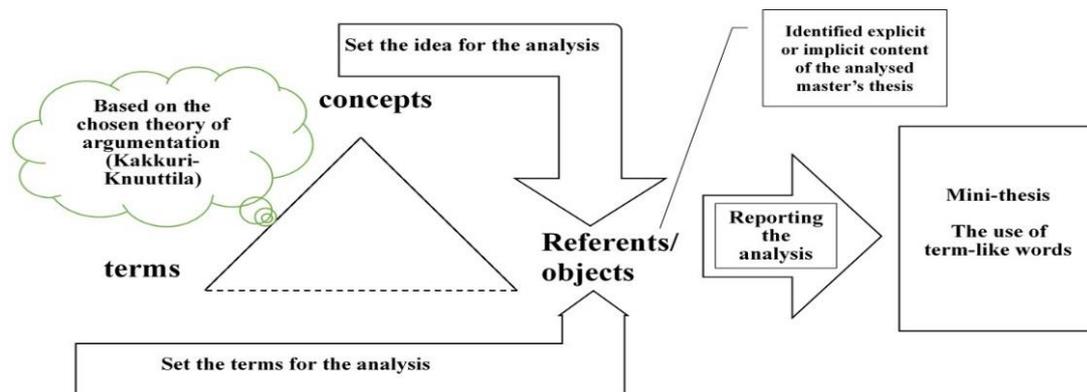


Figure 1. The process from the course assignment to the reported mini-thesis

This study approaches language use from the perspective of discourse analysis, although it applies some ideas of terminology research. Discourse analysis is a method that is used to describe how language is used in social settings, and usually without paying attention to whether the usage is correct. In this study, I analyse lexical items that are semantically linked with the concepts of argumentation analysis. Moreover, terminological problems that arise due to the use of the term-like words are defined to be problems that can be interpreted by comparing the students' choice of words to the terms suggested in the theoretical background, where the intension of the concepts is defined. This comparison forms a basis for evaluating their extension. The problems of intension or extension are detected within the boundaries of discourse analysis. In other words, focusing on the term-like words used by students in their argumentation analysis means focusing on lexical items, which have a linguistic form and construe meanings in the context. It is possible to interpret meanings of lexical items intertextually by comparing them with the meanings of the genre chain, but also intratextually, analysing lexical items within a lexical chain that consists of “cohesive ties sharing the same referent, lexically rather than grammatically expressed” (Rogers 2007: 17). In this study, comparisons within the genre chain are approached from the perspective of the theoretical background used in the argumentation analysis. Methodologically, this means that the meanings of words are interpreted as part of texts, but not compared with immaterial objects (referents). In this case, it would have

¹ L’Homme (2020: 55–66, 72–78) discusses terms as relative notions and how terms are identified. The term *word* is used in this study as synonymous with the term *lexical unit* that L’Homme (2020: 56–58) defines as linguistic expression that has autonomy in a sentence and semantically corresponds with a studied meaning also paradigmatically.

meant cross-checking the analysis of argumentation made by students and the argumentation of the analysed Master's theses. One reason for being able to omit this is that in scientific writing, the thesis should be written in a persuasive manner, which means being so precise that construed meanings of words do not invite the reader to distrust the analysis.

In this paper, the results based on the analysis of 10 texts are reported. The data is gathered from two groups from the courses given in the spring of 2019 and 2020, which had altogether 40 students. In 2019, 6 students did the argumentation analysis and gave their permission to use it as a research material. In 2020, the data was supplemented by the argumentation analysis of 4 students. The analysis of texts proceeded in two phases. First, a genre analysis was carried out, in which texts were grouped based on whether they fulfilled two functions that seemed to vary between texts. The functions were to state the aim of the analysis and to introduce the concepts and terms via sources. Second, the discourse analysis was implemented. It concentrated on ideational meanings that were related to the theoretical background of argumentation analysis. Analysis of meanings operated on the level of discourse-semantics (see Martin & White 2005: 163–164), which means that the interpretations of meanings are not based only on the words in question, but also on the cotext. Moreover, some explanations needed to be interpreted using contextual knowledge available through the genre chain and the teacher's knowledge.

4 Results of the Genre and Discourse Analysis

In the genre analysis, I divided the texts into three groups, Type 1, 2 and 3, based on how the concepts of the theoretical background are introduced by using sources (see Table 1). Type 1 is the *in medias res* -type in which the aim of the analysis is not stated or the concepts and terms are not introduced. As opposite to Type 1, in Type 2 the aim is stated and the concepts are introduced at the beginning of each text (but not necessarily defined). Type 3 falls in between the other types because in these texts the aim is not stated but the concepts are introduced either at the beginning or at the end of the text. In the cases when the terms are defined, the definitions are brief.

Table 1. Data of the study

Writer/coding	T1TM*	T1RM	T1KM	T1MF	T2TM	T2RF	T2JM	T2OF	T3TF	T3VM
Type	Type 1	Type 1	Type 1	Type 1	Type 2	Type 2	Type 2	Type 2	Type 3	Type 3
Length as words**	501	648	491	574	480	646	581	601	649	389
Paragraphs	8	10	9	8	10	7	10	9	9	9
Sources (referenced in texts and listed in bibliographies)	-	-	-	-	Kakkuri-Knuuttila	Kakkuri-Knuuttila	Kakkuri-Knuuttila	Course material + webpage (of an university)	Kakkuri-Knuuttila & Heinalahti	Gaugh + webpage (of an university)
A brief definition of an A,M,C,R,BA***	-	-	-	-	M	A, M, R, BA	M	A, M, C (vague)	A, C, R (vague)	C, R, BA (vague)
Use of a figure or a list that summarizes 'claims'	Figure	-	-	-	-	-	A list in the appendix	-	A list in the text	Figure

* Students' names are shortened in following way: Type of the text, initial letter from the first name + male/female. ** Not included in figures/sources/appendices. *** Argument A, a main claim M, a claim C, a reason R, a background assumption BA.

As can be noted based on Table 1, in the Type 1 texts the analysis was reported without naming any sources, and the students' argumentation analysis was probably based only

on the material given by the teacher. However, the lack of manifest intertextuality in reality might also be due to not embracing the genre expectations of (mini)thesis as an academic text, such as the thesis structure (IMARD). In most cases, in the Type 2 texts, the students have based the introduction of the concepts on the course material or the same source (Kakkuri-Knuutila) that is used as the basis for the course material. One student who used the course material as a source, also used a webpage that describes the pragma-dialectical approach to argumentation. In the Type 3 texts, other sources were used, one being co-written by Kakkuri-Knuutila.

The discourse analysis aims to describe how the concepts and the terms introduced to the students as the theoretical frame for their argumentation analysis were used in the data. In this analysis, I concentrate on five main concepts and the terms used to designate them in the argumentation analysis. These are: **the argument, the main claim, the claim, the reason and the background assumption**. Table 2 illustrates the lexical items of the term-like words of argumentation analysis used in the data. Besides the lexical items that correspond with these five terms, other lexical items related to concepts of argumentation analysis are interesting, because the meanings of these might be overlapping with the ones I focus on in this analysis. These term-like words are listed in the second last row of Table 2. Even though verbs can also be considered as terms (Andersen 2007; L’Homme 2020: 28, 63), I restricted my analysis to nouns, because the meanings of term-like verbs seemed to be even more ambiguous (listed in the last row of Table 2). Table 2 also includes the Finnish originals of the term-like words, which are translated into English.

Table 2. The term-like words of argumentation analysis used in the data

Writer/coding	T1TM	T1RM	TIKM	T1MF	T2TM	T2RF	T2JM	T2OF	T3TF	T3VM
Type	TYPE 1	TYPE 1	TYPE 1	TYPE 1	TYPE 2	TYPE 2	TYPE 2	TYPE 2	TYPE 3	TYPE 3
Argumentation, arguing (argumentaatio, argumentointi)		1 + 1 (sh**)			2	3+2(sh)		4+1(sh)	1 + 1(sh)	5
An argument* (argumentti)	2	1 (sh)			5	1	1	4	5+1(sh)	
A claim (väite)	3	1	5	5+1(sh)	5	2	10	6+1(sh)	4	5
A main claim (pääväite)	1			10	5	7	8	9+1(sh)	1	7 + 1 (sh)
A reason (or gave a reason) (perustelu, a verb + perustelu)		2		21+1(sh)	4	6	12	8+2(sh)		5 + 1 (sh)
A background assumption (taustaoletus)				4+1(sh)	4 + 1 (sh)	3	1	5+1		3 + 1 (sh)
Other term-like words used in the data	An assumption/oletus, olettama [in sum 5 instances that situates in 4 texts] A counter-claim/vastaväite tai vastustava väite [6/5], a counter-argument/vasta-argumentti [3/1], disagreeing opinions/eriävät mielipiteet [2/2], a conclusion/johdopäätös [4/3], a main thesis/pääteesi [1/1], a main aim/päätaivoite [1/1], a main statement/pääväittäjä [1/1], a thesis/teesi [1/1], rhetorical means/retorisin keinoin [1/1], types of arguments/argumenttikeinot [1/1], rhetorical reasons for the claim/retorisia väitteiden perusteluja [1/1], a middle claim/väliväite [12/1], outspoken reason/julkilausuttu perustelu [1/1], argumentation structure/argumentaatorakenne [2/1], a middle reason [1/1], skill of reason [1/1], a premise/premissi [1/1] and (circle of) deductive reasoning/deduktiivinen päättely(kehä) [2/1].									
Term-like verbs used in the data	To argument/argumentoida [in sum 3 instances that situates in 1 text], to claim/väittää [2/2], to justify/perustella [15/8], to take a stand/ottaa kantaa [2/2], to support/tukea [21/8] and to refute/kumota [6/5], to assume/olettaa [2/2].									

* Beside singular forms, plural forms were also taken account. **sh = subheading.

During the analysis, it became evident that the identified type of genre was in most cases a factor that seemed to be connected with the terminological problems. However, each

type of genre encompassed a considerable amount of variety. In the assignment it was advised that the students should first identify the main claim and next the reasons and the reasons for the reasons. *The main claim* was reported to have been identified in 8 of 10 texts. In most cases, identifying the main claim was clearly reported by using the term-like word *main claim*. After that the students continued to state the interpreted referent (Examples 1–2). In one case, the student also reported where the referent was situated in the Master's thesis (Example 3). In two texts (T1RM, T1KM), the main claim was not stated. In these cases, it seems that the idea of the analysis had not been understood; if the main claim was not stated, the description of the analysis focused on describing the content of the Master's thesis, such as re-citing the aim or the research questions. Although the term-like words *a claim* and *an assumption* were used in some sentences, they were not connected to the main claim of the Master's thesis. Therefore, it was not possible to interpret the meanings of these term-like words to be referring to a concept as they should. This interpretation was not even possible based on the cotextual and contextual knowledge and consequently the term-like words are very vague. In these two cases, the descriptions seemed to be too general and the analysis was not explained sufficiently to the reader. As the texts are of Type 1, it seems that the students had not familiarized themselves sufficiently with the theoretical background or even with the assignment, and consequently, they had not learned the concepts or the terms.

- (1) I chose as **the main claim** - - / Valitsin **pääväitteeksi** - - (T1MF, par. 3)
- (2) The main claim of the thesis is that -- / Tutkielman **pääväite** on, että --. (T2RF, par. 2)
- (3) The main claim is formulated in the introduction part of the thesis and is - - / Tekstin pääväite on muotoiltu tutkielman johdanto-osassa ja kuuluu seuraavasti... (T3VM, par. 2)

In one of the Type 1 texts, the student used three different term-like words of his own for the concept of **main claim**. These were *a main statement (pääväittäjä)*, *a main thesis (pääteesi)* and *a main aim (päättäväite)*. None of these was mentioned in the given material. Therefore, it seems that recognizing a term and remembering it seemed to pose a challenge for the student (T1TM). Although several of the term-like words used by the student are familiar from other frameworks of argumentation analyses, for example, the large variety of synonymous expressions negatively affected the readability of the student's text. Moreover, when he used the term-like word *main claim*, he used it in a plural form (see Example 4) and gave examples in a figure, in which there were 16 sentences. This can be interpreted as an error when the meaning of it is compared to the intension of the concept of **main claim**. Thus, it seems obvious that the student had done argument analysis, trying to find and interpret the main claim and the claims supporting it. However, the fact that he mixed the terms in this way clearly indicates that the student either did not concentrate on accuracy and consistency in the use of terms, or was unaware of the importance of these. Even though the lack of describing the theoretical background seemed to be related to indeterminacy in the use of term-like words, one student (T1MF) managed to write a quite consistent text. Example 5 shows that her strategy (used in four paragraphs) had been to use word repetitions, thematic consistency and metatextual lexical items (*first, first, moreover, second*). Her strategy resulted in a text, in which the meanings of term-like words seemed to correspond well to the conceptual ideas presented in the course materials. It seems that she had adopted the main ideas of argumentation analysis and been able to solve the terminological indeterminacy of the given terms *claim* and *reason* quite well. However, her strategy demanded a high level of focus from the

reader because the use of the term-like word *reason* was repetitious, even though cohesive ties aided interpretation.

- (4) Below the "argument analysis" done by Coggle- program of the **main claims** of the thesis is presented. / Alla esitettyinä Coggle- ohjelmalla tehty "argumentaatioanalyysi" tutkielman **pääväitteistä**. (T1TM, par. 5)
- (5) For the **main claim** it was **given** extremely plenty of **reasons** in the Master's thesis. - - The **first** of **given reasons** is that --- and **a reason given** to this is --. **Moreover**, as a **second given reason** for **the first reason** is -- / **Pääväitteelle** on annettu pro gradu -tutkielmassa erittäin paljon **perusteluita**. -- **Ensimmäisenä perusteluna** on, että -- ja tälle **perusteluna** on --. **Lisäksi toisena perusteluna ensimmäiselle perustelulle** on, että --. (T1MF, par. 4)

In the Type 2 texts, the theoretical background was described at the beginning. All 4 students used the term-like words *a main claim*, *a claim*, *a reason* and *a background assumption*, but only one defined the concepts behind all of these (T2RF). Even in cases in which the term-like words were not given any explanations, they seemed to be used accurately and fluently for the most part. However, as in Example 6, the fluency of description might be partly achieved by successfully avoiding to connect the terms *main claim* and *claim*, as *the claims* were brought to the text selectively by appraising them as *essential*, and *moderate and cautious*. Thus, even though the connection between the term-like words was explained in the description of the theoretical background, connecting them in practice was avoided. Likewise, either out of neglect or because of a lack of awareness of the necessity to signify the interpreted 'claims' from the Master's thesis as *claims* in order to write a mini-thesis that functions independently, one student (T2RF) described her findings under the sub-headline "Argumentation analysis of Master's thesis" (*Argumentaatioanalyysi pro gradu -tutkielmasta*) in paragraphs 3–6 by using term-like words only once, and thus the student was not signifying clearly the interpreted 'claims' from the Master's thesis as *claims*. One student (T2JM), whose description of the theoretical background was the most extensive, had obviously read the original source (Kakkuri-Knuuttila) in a thorough manner. From the source, he had also found the term, *a middle claim*, which helped him to report the hierarchies of the claims (the main claim, middle claims, claims), as Example 7 illustrates. At least in his mini-thesis, the frequent use of the term-like words (in sum in total 59 instances, including verbs) correlated with precise writing in which all the observations are clearly signified.

- (6) As **the main claim** of Varelius's thesis may be held – **As other essential claims** may be kept for example that -- Overall **the claims** of the thesis including in **the main thesis** are moderate and cautious. / Vareliuksen (2016) tutkielman **pääväitteenä** voidaan pitää -- Muina olennaisina **väitteinä** voidaan pitää esimerkiksi sitä, että --. Kaiken kaikkiaan tutkielman **väitteet** mukaan lukien sen **pääväite**, ovat melko maltillisia ja varovaisia. (T2TM, par. 3)
- (7) **Argumentation** for the main claim is strong enough in order to be able to consider the study to be convincing. The linkage between **reasons**, **middle claims** and **the main claim** is clear, and thus **the main claim** can be accepted. / **Argumentaatio** pääväitteen puolesta on riittävän vahvaa, jotta tutkielmasta voidaan pitää vakuuttavana. Linkki **perustelujen**, **väliväitteiden** ja **pääväitteen** välillä on selkeä, jotta **pääväite** voidaan hyväksyä. (T2JM, par. 8)

In Type 3 texts, the theoretical background was described with additions to the course material. However, the definitions of concepts were vague, and for example two definitions based on added sources for the concept behind the term-like word *argument* were given, but without stating which one was adopted. The main claim was not defined. In the text, the student (T3TF) used the term-like words *main claim* and *claim* synonymously

and referred with the term-like word *argument* to ‘claims’ of the Master’s thesis. In general, the term *argument* was used to refer to argumentation in a more holistic way, as the concept of **argument** was defined in the course material to cover a claim, a reason and a background assumption. Thus, the usage of the term as synonymous with the term *claim* was ambiguous unless clarified. Added sources also seemed to strengthen the tendency to use term-like words ambiguously. This was the case in the text (T3VM) in which the term-like words *reason* and *background assumptions* (from the course material) and *circle of deductive reasoning, premise, assumptions, conclusions* (from the new source) were used without describing the connections between the concepts. Example 8 shows how the conceptual perspective was transferred, connecting only the perspectives with the term-like word *argumentation*, which was too general a concept to solve definitional inaccuracy, and the word *also*. Beside this, there was a figure in which the analysed ‘claims’ from the Master’s thesis were given. However, the figure did not include any term-like words or their connections, and because of this it did not function as a solution to the terminological problems. In conclusion, widening a conceptual framework might lead to terminological problems, unless the concepts and the terms are synthesized.

- (8) **The argumentation** of the thesis **also** forms a **circle of deductive reasoning**. / Tutkielman **argumentaatio** muodostaa **myös** ohessa esitetyn **deduktiivisen päättelykehän**. (T3VM, par. 9)

Five students (T1MF, T2TM, T2RF, T2JM, T2OF) used the term-like word *a background assumption*, three students (T1TM, T1RM, T1KM) the term-like word *an assumption*, one (T3VM) used both and one (T3VM) used neither. In the assignment, background assumptions were defined as explanations why the reason supports the claim and besides this, a few examples were given. Thus, such a brief background introduction to a complicated issue might explain why the term seemed to be the most challenging of the terms of the argumentation analysis. However, some of the students who had strengthened their mini-thesis (Type 2 or 3) by using other sources were able to make an interpretation and give an example from the Master’s theses (T2TM, T2JM, T3VM). Nevertheless, many students struggled with the term. They (T2RF, T2OF, T3TF) seemed to avoid it by referring to it briefly for the first time in the last paragraph of their text (Example 9) or by not mentioning it at all. In the Type 1 texts, one student (T1MF) seemed to use the term *background assumption* correctly in places, but some of her expressions revealed that she had not really understood the concept (Example 10). Rather than vagueness or ambiguity, this can be seen as an error in interpreting the intension of the concept, which obviously leads to misinterpretation. Three students used only the term-like word *assumption*. In two texts, it is possibly used to refer to the right referent, because a believable example from the Master’s thesis is presented. However, this impression was destroyed at least in one of the two texts (T1TM, T1RM) in the following sentence (Example 11), in which *an assumption* was presented as synonymous with *the main statement*. In one text (T1KM), the term-like word clearly had a different meaning than the extension of the concept **background assumption** allows, because it was referring to ‘assumptions that are made by people in general’. Thus, from the point of view of the assignment, analysing the background assumption was forgotten.

- (9) The main claim of Ekola’s thesis was supported by reasons and background assumptions that were presented before the main claim and functioned as support for it. / Ekolan tutkielman pääväitettä tukevat perustelut ja **taustaoletukset** tulivat ennen pääväitettä tekstistä esiin ja toimivat sen tukena. (T2OF, par. 9)

- (10) A background assumption for the main claim is that this claim holds true. / **Taustaoletuksena** pääväitteellä on, että kyseinen väite (merkityksessä pääväite) pitää paikkaansa. (T1MF, par. 3) – In the main claim and reasons prevail the background assumptions, which -- / Pääväitteessä ja peruste-luissa vallitsee **taustaoletukset**, jotka --. (T1MF, par. 8)
- (11) In the thesis it is held as **an assumption** that JPM influences positively the motivation and job performance --. **This main statement is supported by several arguments**, partly founded on the theory and partly the results of interviews. / Tutkielmassa pidetään oletuksena, että JPM vaikuttaa positiivisesti -- motivaatioon ja työsuorituksiin. Tätä pääväittämää on tukemassa useita argumentteja, joista osa pohjautuu teoriaan ja osa haastattelutuloksiin. (T1TM, par. 2)

Based on the analysis, the preferable strategy is to follow the conventions of the genre. In this way, by stating the aim of analysis, introducing the terms used and describing the theoretical background, the students show that they have familiarized themselves with the assignment and/or the theoretical background. Moreover, by defining the core concepts both writing accurately and analysing becomes easier, if students adjust their analysing according to the definitions. Thus, defining the concepts carries a clear communicative purpose for the readers, but also for the writers who are conducting an analysis.

It seems that, overall, the students did understand what they were required to do, at least at some general level, but many of them had difficulties with reporting their observations especially using such term-like words that highlight the analysis of argumentation. Moreover, whether the assignment is understood fully or only partly, in scientific texts accuracy is clearly connected with persuasiveness: the more indeterminacy with terms, the less persuasive the text is, because it gives an impression that the writer has not familiarized her/himself with the background theory and thus the analysis is not thoroughly credible. However, even though indeterminacy is quite a typical feature in the mini-theses, the reports themselves indicate that students do familiarize themselves with the background and theory of the analysis of argumentation and carry out the analysis. This is also stated in the feedback the students give about the assignment. Based on the feedback on the course, students in general are also very motivated and have a positive attitude towards improving their writing. In conclusion, it could be argued that indeterminacy in mini-theses is mainly due to insufficient reading and/or writing competencies that are related to awareness of terminological ideals.

5 Conclusions

In this study, my own knowledge as a teacher gave me a specific reading position for interpreting terminological problems. Identifying the equivalency or the lack of it in the relations between the term-like words and terms was mainly based on intertextual relations between the meanings conveyed in the genre chain. However, also intratextual relations within the mini-theses, such as connections of different term-like words in the texts, paragraphs or sentences, construe meanings that avail interpreting terminological problems of meanings in mini-theses. In some cases, the identification was based on ideational (relational) meanings between the term-like words and the ideational meanings, which represented interpretations of the content of the Master's thesis, thus excluding a referent, the content of the Master's thesis *per se*.

This study illustrates terminological problems in mini-theses written by students in a specific context. The results show that meanings of term-like words vary considerably because of different linguistic choices made by students. Based on the settings of the study, the variety of meanings can be understood as social variation (see Introduction). Some term-like words are used according to the theoretical background, and thus, may be considered as terms. However, from the point of view of the assignment, some term-like words were used vaguely, ambiguously or to refer to the wrong concepts. In conclusion, terminological problems were often cases of indeterminacy, but in some cases, also more severe errors in language use. As a result, students' texts were often inaccurate and inconsistent. The fact that the students did not manage to fulfil the ideals of scientific writing, such as accuracy and consistency, might be partly explained by the content of the course. It should be noted that the importance of definitions or consistency was not emphasized in the teaching, which might have had an impact on the students' way of writing. Moreover, in this study, the course material that offered the theoretical background could have been terminologically more precise and determined, and maybe even using a theoretical background, in which the concepts and terms have definitions closer to the terminological ideals (see Nuopponen 2003), would help. In any case, more thorough planning might be beneficial in further studies, which are needed in order to illustrate the reasons behind and the pedagogical ways of preventing terminological problems in a more detailed manner.

In the academic writing course, from the constructionist point of view, the terminological problems encountered by students in their own writing, might be seen as possibilities for reflection and for strengthening language awareness and the awareness of the concepts, definitions and the use of terms. Doing this requires illustrating the problems and their consequences, in which the results of this study might be helpful. After identifying one's own strengths and weaknesses, students are more easily motivated to adopt new modes of expression and to learn new tools, such as concept analysis (Nuopponen 2020), in order to do this also in other contexts. An academic writing course might become a course in which the aim is to teach the principles of terminology as a sort of metalinguistic frame. By understanding the metalinguistic principles in relation to language use, a student might gain language awareness which could then be transferred to new situations, even though the context, discipline or even the language changes. As Koskela and Isohella (2018) argue, LPS teaching might aim for goals that are not language-specific. Furthermore, if gaining language awareness is combined with gaining metacognitive genre knowledge, a student's abilities to create authorial identities like experts might be supported.

Sources

- Andersen, Ø. (2002). Terminology and pragmatics. In: M. Koskela, C. Laurén, M. Nordman & N. Pilke (Eds). *Porta Scientiae I. Lingua specialis*. Vaasa: Proceedings of the University of Vaasa. 136–147.
- Andersen, Ø. (2007). Indeterminacy, context, economy and well-formedness in specialist communication. In: Basseys Antia (Ed.). *Indeterminacy in Terminology and LSP: Studies in honour of Heribert Picht*. Amsterdam/Philadelphia: John Benjamins Publishing Company. 3–14.
- Antia, B. (2007). Introduction – LSP studies: Factoring in indeterminacy. In: Basseys Antia (Ed.). *Indeterminacy in Terminology and LSP: Studies in honour of Heribert Picht*. Amsterdam/Philadelphia: John Benjamins Publishing Company. XIIV–XXII.
- Berkenkotter, C. & Huckin, T. (1993). Rethinking Genre From a Sociocognitive Perspective. *Written Communication* 10(4), 475–509.

- Duff, P. A. (2010). Language Socialization into Academic Discourse Communities. *Annual Review of Applied Linguistics* 30, 169–192.
- Evergreen, M., Cooper, R. & Loughran, J. (2016). Investigating the use of term recall and recognition tools in learning terminology and concepts in a senior biology classroom. *Asia-Pacific Forum on Science Learning & Teaching* 17 (2), 1–26.
- Fairclough, N. (1992). *Discourse and Social Change*. Cambridge: Polity Press.
- Hao, J. (2020). Nominalisations in scientific English: A tristratal perspective. *Functions of Language* 27(2), 143–173. <https://doi.org/10.1075/fof.16055.hao>
- Hyland, K. (2002). Authority and invisibility: authorial identity in academic writing. *Journal of Pragmatics* 34(8), 1091–1112.
- Katajamäki, H. (2009). An Editorial and its Intertextual Links. Case Study of a Finnish Business Newspaper. In: M. Enell-Nilsson & N. Nissilä (Eds). *Käännösteoria, ammattikielet ja monikielisyys. Vakki-symposiumi XXIX. Vaasa 13.–14.2.2009*. Vaasa: VAKKI 36. 204–215.
- Katajamäki, H. & Koskela, M. (2018). Lexical metaphor as judgement: attitudinal positioning of editorial writers in business newspapers. *Fachsprache: Journal of Professional and Scientific Communication* 40, 140–160. <https://doi.org/10.24989/fs.v50i3-4.1479>
- Katajamäki, H. (2020). Käsitteiden analysointi tieteellisen kirjoittamisen oppimisen menetelmänä. In: H. Katajamäki (Ed.). *Tieteellinen kirjoittaminen tiedeyhteisössä*. Vaasa: VAKKI 11. 12–39.
- Swales, J. M. (2004). *Research Genres: Explorations and Applications*. Cambridge: Cambridge University Press.
- Koskela, M. & Isohella, S. (2018). Teaching LSP to technical communicators. In J. Humbley, G. Budin & C. Laurén (Eds). *Language for Special Purposes: an International Handbook*. 96–110. Boston/Berlin: Mouton De Gruyter. <https://doi.org/10.1515/9783110228014-005>
- Laurén, C. & Nordman, M. (1998) [1987]. *Från kunskapens frukt till Babels torn. En bok om fackspråk*. Vaasa: Vaasan yliopiston kirjasto. Available at <http://urn.fi/URN:ISBN:951-683-711-5>
- L’Homme, M.-C. (2020). *Lexical Semantics for Terminology. Introduction*. Amsterdam/Philadelphia: John Benjamins Publishing Company.
- Martin, J. & White, P. (2005). *The Language of Evaluation. Appraisal in English*. Hampshire/New York: Palgrave Macmillan.
- Myers, M. J. (2018). LSPs As Instruments For Science Communication. In J. Humbley, G. Budin & C. Laurén (Eds). *Language for Special Purposes: an International Handbook*. 406–434. Boston/Berlin: Mouton De Gruyter. <https://doi.org/10.1515/9783110228014-005>
- Negretti, R. & Kuteeva, M. (2011). Fostering metacognitive genre awareness in L2 academic reading and writing: A case study of pre-service English teachers. *Journal of Second Language Writing* 20, 95–110. <https://doi.org/10.1016/j.jslw.2011.02.002>
- Nissilä, N. & Nuopponen, A. (2012). Terminologin näkökulma synonymiaan. In: N. Nissilä & N. Siponkoski (Eds). *Languages in Motion. VAKKI-symposiumi XXXII 11.–12.2.2012*. Vaasa: VAKKI Publications 1. 219–229.
- Nuopponen, A. (1994). *Begreppssystem för terminologisk analys*. Vaasa: Acta Wasaensia 38.
- Nuopponen, A. (2003). Terminology. In: W. Frawley (Ed.). *The International Encyclopedia of Linguistics*. 2ND edition. Oxford: Oxford University Press. 225–227.
- Nuopponen, A. (2020). Systemaattinen käsiteanalyysi tutkijan työssä. In: H. Katajamäki (Ed.). *Tieteellinen kirjoittaminen tiedeyhteisössä*. Vaasa: VAKKI 11. 94–122.
- Pyritz, L.W., King, A.J., Sueur, C. et al (2011). Reaching a Consensus: Terminology and Concepts Used in Coordination and Decision-Making Research. *Int J Primatol* 32, 1268–1278.
- Rogers, M. (2007). Lexical chains in technical translation. A case study of indeterminacy. In: Bassege Antia (Ed.). *Indeterminacy in Terminology and LSP: Studies in honour of Heribert Picht*. Amsterdam/Philadelphia: John Benjamins Publishing Company. 15–36.
- Solin, A. (2001). Intertextuality as mediation. On the analysis of intertextual relations in public discourse. *Text* 24(2), 267–296.
- Swales, J. (1990). *Genre Analysis. English in Academic and Research Settings*. Cambridge: Cambridge University Press.
- Tardy, C. M. (2009). *Building Genre Knowledge*. West Lafayette: Parlor Press.
- TSK = Finnish Terminology Centre TSK (2020). TEPA Term Bank. Available at <https://termipankki.fi/>.
- Wright, S. E. & Budin, G. (1997). *Handbook of Terminology Management: Volume 1: Basic Aspects of Terminology Management*. Amsterdam/Philadelphia: John Benjamins Publishing Company.