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Integrating Terminological Methods
into Teaching English for Specific Purposes

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TIIVISTELMÄ

Tutkimuksen tavoitteena oli selvittää, miten korkeakoulutasoista ammattienglannin opetusta voidaan kehittää integroimalla terminologisia menetelmiä osaksi opetusta ja oppimistehtäviä. Viitekehys muodostuu systemaattisesta käsiteanalyysistä ja siinä käytetyistä yleisimmistä käsitesuhdetyypeistä sekä lisäksi ammattienglannin (English for Specific Purposes, ESP) ja terminologisten menetelmien opetukseen liittyvistä menetelmistä ja tutkimuksesta.

Tutkimus toteutettiin toimintatutkimuksena Lahden ammattikorkeakoulussa (nyk. LAB-ammattikorkeakoulu) liiketalouden ja matkailun alan ammattienglannin opintojaksoilla. Osana tutkimusta laadittiin terminologisia menetelmiä englanniksi käsittelevä luentoaineisto ja oppimistehtävä, joita käytettiin neljällä opintojaksolla. Opiskelijat laativat oppimistehtävässä erilaisiin ammattiaiheisiin liittyviä käsitejärjestelmiä kuvaavia graafisia esityksiä eli satelliittimalleja ja kirjoittivat käsitteiden määritelmiä englanniksi. Satelliittimallit ja käsitteiden määritelmät luokiteltiin tutkimuksessa neljään kategoriaan. Näin selvitettiin, miten hyvin opiskelijat osasivat soveltaa menetelmiä. Lisäksi opiskelijat vastasivat kyselyyn, jolla selvitettiin näkemyksiä luentoaineistosta, oppimistehtävästä ja sovelletuista terminologisista menetelmistä. Kyselyn vastaukset analysoitiin ja luokiteltiin.

Tutkimus osoitti, että ammattienglantia opiskelevat korkeakouluopiskelijat osaavat laatia satelliittimalleja ja määritellä käsitteitä englanniksi, vaikka osa opiskelijoiden palauttamista tehtävistä olisikin voinut olla yksityiskohtaisempia. Moni kyselyyn vastannut koki käsitellyt menetelmät hyödyllisiksi ja opetusaineiston ymmärrettäväksi. Toisaalta vastauksista ilmeni lisämotivoinnin tarve, joten opettajan kannattaa painottaa terminologisten menetelmien hyötyjä. Lisäksi vastauksista ilmeni, että opettajan antama lisätuki oppimistehtävän työstämiseksi on tärkeää. Oppimistehtävän ohjeistuksen pitää olla selkeä, sillä osa koki aineistot vaikeaselkoiseksi. Kaiken kaikkiaan toimintatutkimus tuki ajatusta siitä, että korkeakoulutasoista ammattienglannin opetusta voidaan ja kannattaa kehittää integroimalla opetukseen terminologisia menetelmiä ja näiden soveltamiseen ohjaavia oppimistehtäviä.

AVAINSANAT: ammattienglanti, ESP, systemaattinen käsiteanalyysi, käsitesuhteet, satelliittimalli, terminologinen tutkimus, terminologiset menetelmät, toimintatutkimus

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ABSTRACT

This study aimed to develop university-level English language teaching by examining the integration of terminological methods into English for Specific Purposes (ESP) language teaching. The research framework is based on systematic concept analysis and common concept relation types as well as ESP language teaching practice and teaching terminological methods.

The study was conducted as an action research project at Lahti University of Applied Sciences (now LAB University of Applied Sciences), Finland, in the Faculty of Business and Hospitality Management. To integrate terminological methods into ESP language teaching, a set of lecture materials and a course assignment were created. These were used on four ESP language courses. The students created graphical representations, satellite models, of concept systems related to professional topics and wrote concept definitions in English. To find out how well the students had managed to use the methods, the submitted satellite models and concept definition documents were categorized into four evaluative categories. In addition, the students answered a questionnaire whose objective was to find out their views on the lecture materials, the course assignment, and the applied terminological methods. The answers were analyzed and categorized.

The results showed that university-level students on ESP language courses can create satellite models and write concept definitions in English, although some of the created assignment products could have been more detailed. Many of the respondents considered the methods as useful and the teaching materials easy to understand. On the other hand, some answers revealed a need for additional motivating, so it is recommended to emphasize the benefits of terminological methods. In addition, the answers revealed that it is important to get more help with the course assignment from the teacher. Moreover, the course assignment instructions should be clear since some respondents considered the materials difficult to understand. Overall, this action research project supported the idea that it is possible and recommended to develop university-level ESP language teaching by integrating terminological methods and related coursework into its teaching practices.

KEYWORDS: action research, concept relations, ESP, English for Specific Purposes, analysis, terminology science, terminological methods, the satellite model

1 INTRODUCTION

It is sometimes thought that the vocabulary, terminology, used in a professional field is what defines communication in that field. Gollin-Kies, Hall and Moore (2015: 13–14), note that this is a superficial view and sometimes taken by, for instance, novice language teachers who may design special-language courses by focusing on vocabulary-building exercises. While vocabulary is a key feature, successful professional communication requires more. Learning to apply the communicative practices of a professional field is a challenge. In addition to linguistic proficiency, professional communication depends on understanding work-related and disciplinary concepts and entire concept systems that organize knowledge structures (see Basturkmen 2006: 137; Nuopponen 2018: 453–454).

Regarding special-language teaching, modern English for Specific Purposes (ESP) language teaching does its best to meet the challenge. According to Basturkmen, it aims to teach background knowledge, disciplinary concepts, and ways of thinking in professional situations. Another key aim is to develop strategic competence to let learners have control over the knowledge they already have of the specific field. Even if such knowledge is conscious, it might be latent so that learners may not have full control over it. (Basturkmen 2006: 137–139.) Regarding ESP language teachers, meeting such aims may seem to require in-depth subject knowledge, which poses a dilemma and has caused debate (see Gollin-Kies et. al 2015: 195–197; Lesiak-Bielawska 2015: 3–5, 10–11).

To help EPS language teaching meet the challenge and aims, introducing methods designed for terminology work can prove useful since these are used for analyzing concepts, they are used for creating concept systems (i.e. knowledge structures), and they are used for making these apparent. Pilke (2008: 14) has noted in the context of Swedish for professional purposes language teaching that, by using terminological methods, learners become familiar with disciplinary knowledge, analyze knowledge structures by examining concept relations, and present their findings as concept systems. Drawing on the idea that terminological methods can help develop ESP language teaching, I present here a teacher-initiated action research project in which I introduced and tested teaching terminological methods in the context of ESP language courses.

1.1 Research aim

The aim of this study is to develop ESP language teaching to better meet its aims by examining the integration of terminological methods into English for Specific Purposes (ESP) language courses. The courses in question are aimed at university-level students studying to become future business and other professionals. The practices I present in this study are based on the methods and principles of *systematic concept analysis* as described by Nuopponen (e.g. 2010a; 2011) and certain principles of writing concept definitions.

Systematic concept analysis focuses on clarifying concepts by establishing their locations in concept systems (Nuopponen 2010a: 5) and uses the so-called *satellite model* to visualize concept relations and concept systems (see e.g. Nuopponen 2011; 2016; 2018). Writing *concept definitions* is another key element I adapted from terminology work for this study. In general, concept definitions are descriptions that distinguish the defined concept from others in a specific concept system (Suonuuti 2001: 19; ISO 1087 2019: 3.3.1). Finally, I use the expression *terminological methods* to cover both creating satellite models and writing concept definitions.

To meet the research aim, the study has two research questions. The first one takes the teacher's perspective and focuses on learners' ability to create satellite models and concept definitions in coursework that draws on systematic concept analysis:

1. What kinds of satellite models and concept definitions can ESP language students produce in the assigned coursework to identify and define professional concepts in English?

Paraphrasing Hutchinson and Waters, Basturkmen (2006: 137; italics added for emphasis) explains that ESP language teaching “should focus on developing students’ *knowledge of [...] disciplinary concepts* as well as their language skills.” My attempt to integrate the use of terminological methods into ESP coursework is a step further. In addition to developing knowledge of concepts, ESP language learners can start using the methods to examine and define professional concepts themselves in English for various communicative purposes. They may then continue to use the methods in their future work

as business professionals or others. Knowing about terminological methods would, in fact, be a good addition to any future professional's skillset (see Nuopponen 2003a: 21).

The second research question takes the learner's viewpoint to find out ESP language students' views on the introduced terminological methods and the related teaching materials:

2. What are the participating ESP language students' views on systematic concept analysis, the satellite model, and the related teaching materials and assignment?

In ESP language teaching, it is common practice to do needs analysis to design courses but also to revise courses (Basturkmen 2010: 17–19; 25–26). In this study, as these new elements (i.e. terminological methods) are integrated into the context of university-level ESP language teaching, it is even more important to examine learners' views to find out how to revise teaching practice and the created materials for future use.

In general, the ideas and findings presented in this study may benefit ESP language teachers, especially those who might be struggling with the question of how much and what kind of subject knowledge is needed to teach ESP language courses. Lesiak-Bielawska (2015: 3) notes that there is no obvious answer to the following question: “[W]ho will be a better ESP teacher: a philology graduate with discipline-specific background, [a] qualified specialist, e.g. a lawyer, with qualifications for language teaching or an EGP teacher with some general knowledge of a given field and its discourse?” This remains unanswered and is also outside my scope in this study. However, as I maintain here, from a practicing ESP language teacher's perspective, teaching terminological methods can be useful in the context of university-level ESP language teaching. Instead of struggling with the above question and such, an ESP language teacher can teach terminological methods and create related course assignments, at least in higher education settings, so that ESP language learners themselves can start identifying professional concepts and acquiring related professional knowledge in English.

As the above indicates, this study is at the intersection of modern ESP language teaching, terminology training, and methods used for terminology work (i.e. terminological methods). Figure 1 presents the research context of the study.

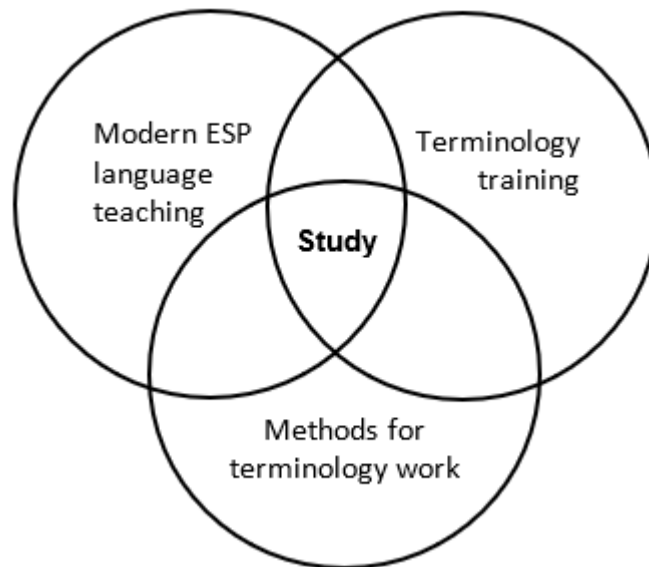


Figure 1. Research context

Terminology-related training is offered in various settings. For example, it is sometimes an integral part of the curricula of translation studies and other degree programs at universities. (See Picht & Acuña Partal 305–308; Nuopponen 2019.) Korkas et al. (2005: 2–3) introduce the learning objectives of the courses offered in a master’s degree program at the University of Surrey:

1. To familiarize students with the special language [...] employed in different fields and genres [...], at different levels of specialization, in both source and target language, so that they may convey the pertinent information accurately, clearly and succinctly [...].
2. To provide students with a good grounding in the specific terminology encountered [...] as well as the issues and concepts to which they relate.
3. To enable students to recognize and solve terminological problems.
(Korkas et al. 2005: 2–3.)

While these objectives are designed for courses that train future language professionals, they are also relevant to university-level ESP language courses. Namely, (1) familiarizing ESP language learners with the special language of a specific field and (2) giving them some grounding in the terminology of their field are, of course, also part of ESP language

teaching. However, teaching (3) how to solve specific terminological problems (e.g. synonymy, polysemy, or finding equivalent terms) is somewhat outside the scope of most ESP language courses. Regarding terminology training, Picht and Acuña Partal (1997), for example, have listed certain key elements usually taught and didactic methods often used in terminology training. I discuss these in chapter 3.

ESP language teaching helps ESP language learners acquire professional communication skills in English because being able to communicate with clients, experts, and colleagues is important for any future professional. Tarnopolsky (2012; 2015) has described an approach that helps ESP language learners acquire such skills. The related activities are interactive and simulate professional situations that require learners to use outside resources (e.g. the Internet) to find information in English. This approach draws on *the experiential learning theory* created by David Kolb (1984; also e.g. David & Alice Kolb 2005; 2017), which theorizes learning to be based on experience and reflection. The course assignment I created to integrate terminological methods into my ESP language courses relates to experiential learning. Chapter 2 discusses ESP and experiential learning in more detail.

The course assignment requires students to visualize concept systems. This makes knowledge structures visible and may improve learning. Davies (2011: 280), for example, maintains that it has been established, and there is empirical evidence of this, that manipulating information relations in a visual format may enhance learning. Mind maps can be good for representing free associations between ideas, whereas concept maps help in understanding relations between concepts. Kankkunen (1999: iv, 64) points out that concept maps may improve the learning process and help different kinds of learners in learning concepts and their meanings. The satellite model, although it was developed independently, reminds mind maps and concept maps (Nuopponen 2016: 190). It is a versatile visualization tool but also has a more defined use: to visualize concept systems. The satellite model was developed by Nuopponen as part of her terminology courses and research. (See Nuopponen 2011; 2016.) Chapter 3.5 discusses mind maps, concept maps, and the satellite model.

Regarding terminology work and analyzing concepts, concept analysis helps in creating conceptual clarity. Systematic concept analysis, as described by Nuopponen, combines terminological concept analysis with certain more research-focused concept analysis methods (Nuopponen 2010a: 5–6). The analysis process has several steps as Nuopponen (2010a) presents in her article “Methods of concept analysis – Towards systematic concept analysis”. I introduce systematic concept analysis here in more detail in chapter 3.6 and explain how the analysis process is integrated into my course assignment instructions and in doing the course assignment.

Finally, I should note some reservations in brief. Namely, Nuopponen (2018: 454) explains that “terminological methods [...] were developed in the first place for normative terminology work and standardization.” In addition, the satellite model, as Nuopponen (2016: 196) notes, was “born in an educational context [...] as a general concept analysis tool for terminology work and projects in any knowledge domain.” In other words, systematic concept analysis, writing concept definitions, and the satellite model were first developed with professional terminology work in mind. Nuopponen (e.g. 2010a; 2010b; 2011: 2020) has, however, been extending their use, for example, for research purposes. This study is an attempt to extend their use for university-level English for specific purposes language teaching.

1.2 Research project

I started the study as an action research project at Lahti University of Applied Sciences (Lahti UAS) in the autumn of 2018. According to Burns (2010: 2; original italics), the key idea “of the *action* part is to [...] bring about changes and, even better, improvements in practice.” Moreover, as Burns (2005: 241–242) outlines, the following four characteristics define action research: (1) research questions arise from practice, and the participants (e.g. teachers and students) are participating in the process; the aim is (2) to develop teaching practice and (3) to provide new theoretical viewpoints; (4) and the aim is to introduce change. All these characteristics are also present in this study.

Because I work as a senior lecturer in English language and professional communication and teach ESP language courses to bachelor's degree students, (1) this study and its research questions draw on my background and experience as an ESP language teacher. (2) My attempt in this study is to develop ESP language teaching practice by integrating terminological methods into ESP language courses and coursework. (3) The study provides a new theoretical viewpoint by combining terminology science with ESP language teaching, and (4) the study suggests a change to ESP language teaching so that it could start taking advantage of terminological methods.

Action research has gained ground in researching English language teaching practice since the 1990s, and two types of action research projects are especially common: (1) action research reported by researchers who have introduced it in university-level degree programs that train English language teachers; (2) action research carried out by teacher-researchers for tertiary qualifications. The third type is (3) action research carried out for professional development and often as part of collaborative projects. (Burns 2005: 245, 248.) The research project reported here is a combination of the second and third type with the difference of this being an individually conducted, not a collaborative action research project. In other words, after identifying the research niche at the intersection of ESP language teaching, terminology training, and terminological methods, I conducted the research project as a practicing ESP language teacher to fulfill the requirements of a master's degree program focusing on technical communication and terminology science (2) and also for personal professional development (3). Regarding professional development, I should add that, in addition to personal professional development, the study aims to serve a more general purpose.

Action research projects usually have certain phases. Burns (2010: 8) identifies the following four based on Kemmis and McTaggart (1988): 1) planning, 2) action, 3) observation, and 4) reflection. In phase 1, the teacher identifies a problem and designs a plan to introduce improvements. In phase 2, the teacher introduces interventions in teaching situations over a certain period. In phase 3, the teacher observes the effects the action has and documents data (e.g. opinions of those involved). In phase 4, the teacher

reflects on, evaluates, and describes the action and its results. Figure 2 outlines the action research project reported here based on the four phases.

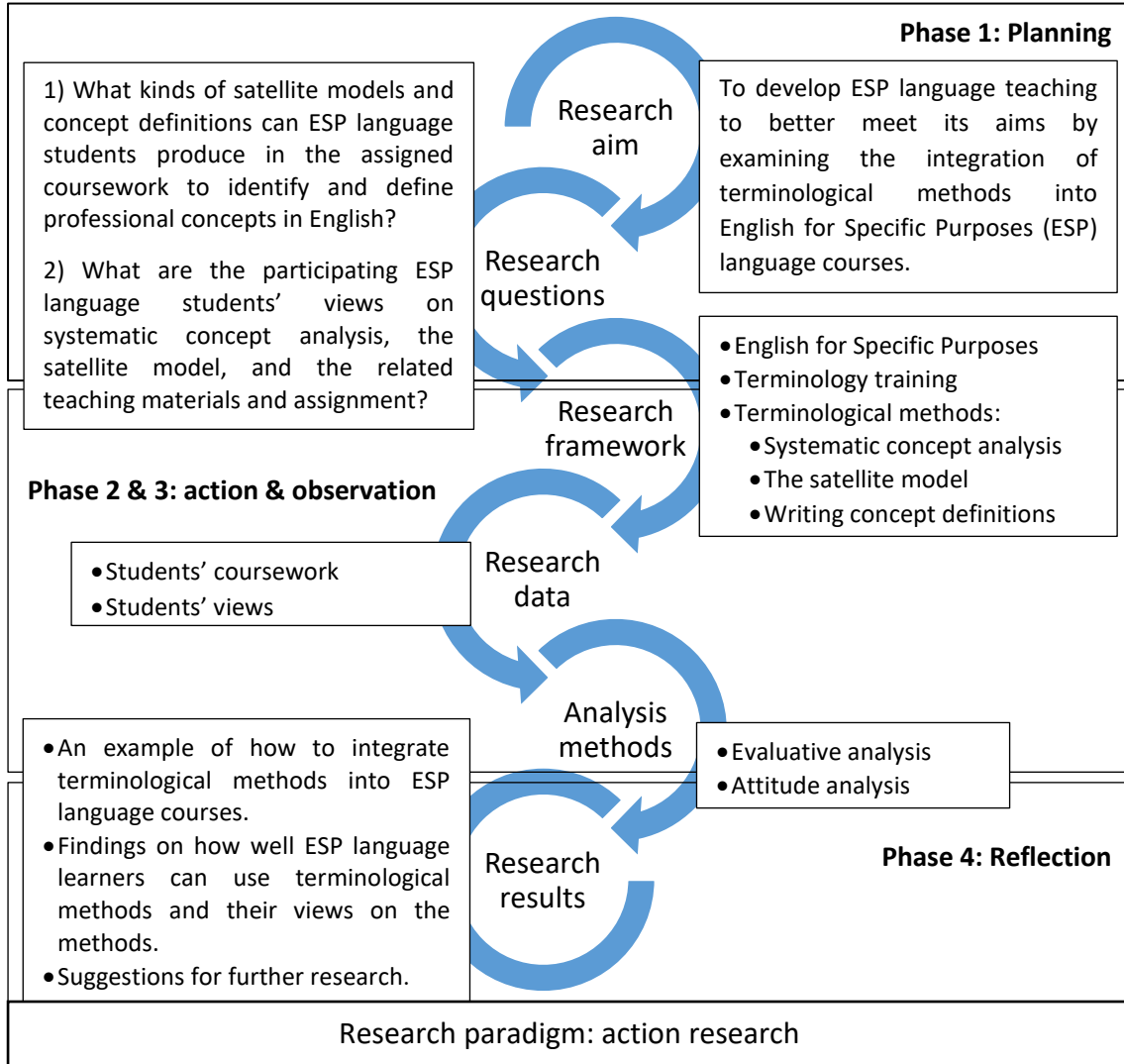


Figure 2. Phases of the research project

In phases 1 and 2, I created a plan and materials to integrate terminological methods into my ESP language courses. I gave a lecture to explain the background (e.g. concept relation types) and instructed the course assignment. In the course assignment, my students examined a professional topic by applying systematic concept analysis and created satellite models to visualize concept relations and concept systems. They then wrote concept definitions in English. Finally, phase 3 and 4 involve collecting and analyzing data and writing this thesis (i.e. reflecting on, reporting, and presenting results).

1.3 Research data and analysis methods

Lahti UAS became part of the LUT Group with Lappeenranta University of Technology and Saimaa University of Applied Sciences. In January 2020, the two universities of applied sciences then merged and formed a new organization, LAB University of Applied Sciences. (LAB 2019a; LUT 2019.) Since I started the research project in the autumn of 2018 at Lahti UAS, the thesis refers only to Lahti UAS. Moreover, at the time of finalizing the work in the spring of 2020, most organizational practices and structures at LAB UAS in Lahti were still mostly based on those of Lahti UAS.

I carried out the research project on the following four ESP language courses: *English for Work (IT)*, *English for Work (BIT)*, *English for Work (TOURISM)*, and *Global Communication in Business*. *English for Work* is a first-year course offered in the first semester of studies. It is compulsory in all faculties. In the Faculty of Business and Hospitality Management, the course focuses on general business themes (with IT students also IT topics) and working-life themes. *English for Work (IT)* is for IT students enrolled in a degree program taught in Finnish, *English for Work (BIT)* is for IT students studying in English, and *English for Work (TOURISM)* is for tourism and hospitality management students studying in Finnish. *Global Communication in Business* is a third- or fourth-semester course (i.e. second year) and compulsory in most programs in business. It focuses on professional speaking and writing skills (e.g. conducting meetings and writing business messages in English in global settings). The names of the courses are abbreviated here as follows: *EfW IT*, *EfW BIT*, *EfW TOUR*, or simply *EfW*, and *GLOBAL*.

Regarding coursework, the data included 43 satellite models and 40 concept definition documents. At the end of each course, I administered an online questionnaire to collect the students' views on the teaching materials and terminological methods. The questionnaire collected background data and included nine statements answered on a scale of 1 (strongly disagree) to 5 (strongly agree). It was available in Finnish and English and was answered anonymously. While some examples of the students' assignment products are available and discussed in chapter 4, screenshots of the questionnaire are

available in Appendix 1 (in Finnish) and Appendix 2 (in English). Table 1 summarizes the collected data.

Table 1. Research data summarized

Course	Enrolled Students	Satellite Models	Concept Definition Files	Questionnaire Respondents
<i>English for Work (IT)</i> • <i>EfW IT</i>	39	11	11	31 (FIN)
<i>English for Work (BIT)</i> • <i>EfW BIT</i>	10	7	7	5 (ENG)
<i>English for Work (Tourism)</i> • <i>EfW TOUR</i>	40	9	8	35 (FIN)
<i>Global Communication in Business</i> • <i>GLOBAL</i>	29	16	14	24 (18 FIN/ 6 ENG)
Total	118	43	40	95 (81%)

I chose a mixed-methods approach to analyze the data. Mixed methods research generally combines qualitative and quantitative methods, or the analyzed data is quantified or qualitized (Dörnyei 2007: 44–45). Here, the applied analysis methods are *evaluative analysis* and *attitude analysis*.

Evaluative analysis is a type of systematic qualitative data analysis. Kuckartz (2014: 88; original italics) explains that it “involves *assessing, classifying, and evaluating content*.” Here, it relates to the first research question. That is, I applied the method to examine the satellite models and concept definitions my students created; my analysis divided these into two: *Category 1: quality of satellite models*; *Category 2: quality of concept definitions*. I then assigned the following levels to each assignment product: *Level 3: thorough to extensive use of terminological methods*; *Level 2: some to thorough use of terminological methods*; *Level 1: some use of terminological methods*; *Level 0: very little use of terminological methods or cannot be classified*. This produced both quantified and qualitative results. I have summarized the results in charts and discuss examples belonging to each category and level.

The questionnaire data represents my students’ views on the lecture materials, the course assignment, and systematic concept analysis and the satellite model. This relates to the

second research question. I divided the data into two based on the nine statements in the questionnaire: *Group 1: views on the topic and the materials (statements: 1–4)*; *Group 2: views on the two terminological methods (statements 5–9)*. I then collected and summarized the results in tables by presenting frequency counts but also relative frequencies (percentages) in parentheses. As the questionnaire applied a Likert-type response format commonly used to examine attitudes and opinions, I have decided to call this analysis method *attitude analysis* (cf. Jelovčić 2010). This mostly produced quantified results.

2 ENGLISH FOR SPECIFIC PURPOSES (ESP)

As this study is at the intersection of terminology studies and English for Specific Purposes language teaching, this chapter discusses English for Specific Purposes (ESP). To provide background, I first discuss ESP in relation to Language for Specific/Special Purposes (LSP) and then in further detail. In addition, I discuss the so-called experiential learning in this chapter since most university-level ESP language teaching and some terminology training draw on this or related ideas (see e.g. Picht & Acuña Partal 1997; Tarnopolsky 2012, 2015). Moreover, as I already briefly noted in chapter 1.1, the course assignment I created draws on experiential teaching practices.

2.1 Language for specific purposes

The term *Language for Specific Purposes* (LSP) is polysemous because it may refer to the language varieties used in specific professional or other (e.g. academic) settings but also to teaching and researching these varieties. These different meanings of the term have been explained, for example, as follows: “LSP as a description of a language variety and LSP as a curriculum/pedagogic variety” (Gollin-Kies, Hall & Moore 2015: 14). The latter can, for instance, refer to settings where students studying to become professionals acquire concepts and knowledge of the field during their training, or to situations where translators need to acquire special-field knowledge (Varantola 1986: 13). In addition, the term ESP is often used synonymously with LSP in English-dominated contexts. For example, while noting that LSP extends to other languages, Gollin-Kies et al. (2015: 11; original italics) maintain that “[w]hen people speak of *Language for Specific Purposes*, they generally think about English for Specific Purposes [...]” Although not synonymous with LSP, ESP is rooted in and part of LSP.

As a language variety, LSP exists in a profession or field when people in discourse communities communicate with each other. *Discourse communities* refer to groups whose members have shared goals and who actively communicate to achieve these goals. (Borg 2003: 398.) LSP as a pedagogic variety, on the other hand, exists in educational settings

where the aim is to train future language specialists, such as terminologists and translators. Alternatively, it exists in settings where the aim is to teach future business and other professionals to become effective communicators in specific fields. The research context of the thesis falls into this second type.

LSP teaching is pedagogically motivated with the aim to create language teaching materials and learning activities, whereas LSP research often emphasizes research on language varieties used in professional settings. Such research examines social relations and therefore relates to sociology, anthropology, and political science. (McGroarty 2010: 319–320.) Indeed, LSP research is interdisciplinary and also draws on terminology science and translation studies; much research is done especially in technical terminology (Gollin-Kies et al. 2015: 8, 12–13).

I see ESP, as a part of LSP, from the narrow, pedagogically motivated perspective. In other words, I see it through a pedagogical prism and discuss it here from the perspective of a specific kind of English language teaching: English language teaching aimed at university-level students who are studying to become business and other professionals. To avoid ambiguity, I use the expression *ESP language teaching* throughout the thesis rather than the term *ESP*. Generally, ESP language teaching aims to provide communication skills and tools that help students succeed in their future professional settings (i.e. discourse communities) in English. I consider systematic concept analysis, the satellite model, and defining concepts as part of the skillset.

2.2 ESP and its common varieties

ESP language teaching is said to differ from teaching general English. For example, Basturkmen (2006: 9; 2010: 3) explains that ESP language teaching is goal-oriented and focuses on work- or study-related needs. Dudley-Evans and St John (1998: 4) note that it uses a methodology different from teaching general English. In ESP language teaching, the interaction between the learner and the teacher is different; an ESP language teacher is sometimes “like a language consultant, enjoying equal status with the learners who

have their own expertise in the subject matter” (Dudley-Evans and St John 1998: 13). The more specific the content, the more the ESP language teacher may need to draw on learners’ existing knowledge.

Although ESP language teaching comes in various forms, there are shared characteristics. To define it, Dudley-Evans and St John have provided an often-quoted list of absolute and variable characteristics (e.g. Basturkmen 2010: 13; Alssen 2012: 38; Abedeen 2015: 47–48). Table 2 below presents the characteristics.

Table 2. Characteristics of ESP language teaching (based on Dudley-Evans & St John 1998: 4–5)

Absolute characteristics: ESP language teaching	Variable characteristics: ESP language teaching
<ul style="list-style-type: none"> • meets the specific needs of the learner. • uses the underlying methodology and activities of the disciplines it serves. • centers on the language (grammar, lexis, register), skills, discourse and genres appropriate to these activities. 	<ul style="list-style-type: none"> • relates to specific disciplines. • uses a different methodology from that of general English teaching. • is designed for adult learners at tertiary level institutions or in professional situations. It can, however, be used at secondary level. • is usually designed for intermediate or advanced students. It assumes basic knowledge of the language, but it can be used with beginners.

As the first of the absolute characteristics on the list in Table 2 notes, ESP language teaching aims to meet learners’ needs. The two other absolute characteristics relate ESP language teaching to a specific discipline and its communicative practices. Regarding the variable characteristics, ESP language teaching has to do with specific disciplines and differs from general English teaching. In addition, the target audience is described in the variable characteristics. It usually consists of, for example, university students with good English skills. At Lahti UAS, for example, it is expected that students taking ESP language courses have intermediate to upper-intermediate English skills. Likewise, Tarnopolsky (2015: 157) notes that, for ESP language learning to be effective, students should have at least intermediate level English skills, or B2 level skills according to the *Common European Framework of Reference for Languages* (see CEFR 2001). Finally, although ESP language teaching has usually been considered as part of English as a

foreign language teaching (e.g. Hutchinson & Waters 1987: 17), university-level ESP language courses may have native speakers on them. At Lahti UAS, native speakers (e.g. American, British, or Canadian students) are not automatically exempt from taking compulsory ESP language courses.

ESP language teaching is often divided into two main branches: *English for Academic Purposes* (EAP) and *English for Occupational Purposes* (EOP) (e.g. Dudley-Evans & St John 1998: 5–6). English for Academic Purposes focuses on the language skills needed for study purposes. As Alssen (2012: 34) explains, it mostly dates to the 1960s to Britain; it was part of English as a foreign language teaching and aimed to help non-native speakers manage in their studies. English for Occupational Purposes, then, refers to the language skills needed for non-professional vocational use, but it is also used when referring to the communication skills needed in professional contexts (e.g. in administration, business, technology, etc.) (Dudley-Evans & St John 1998: 7). The term *English for Professional Purposes* (EPP) is also used in literature to distinguish between occupational and more professional needs (see e.g. Basturkmen 2010: 6). Courses in English for Academic Purposes and English for Occupational Purposes can be divided according to the context and timing of the course. Figure 3 illustrates this.

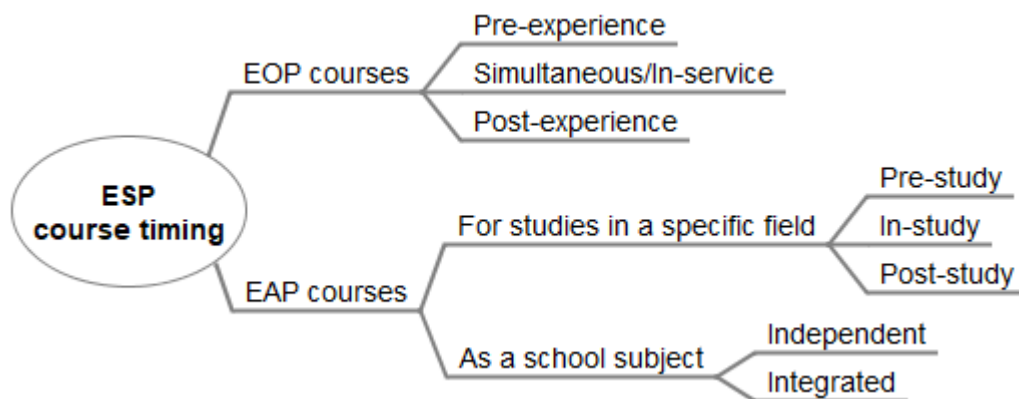


Figure 3. ESP course timing (based on Dudley-Evans & St John 1998: 66)

The context and timing of an ESP language course affect its specificity. A pre-experience course would rarely include in-depth domain-related content or require much professional knowledge. Some ESP language courses, however, may be integrated with domain-related courses and have more specific content. (Dudley-Evans & St John 1998: 6.)

Subsequently, the different varieties of ESP language courses are often divided further in terms of whether the focus is generic or specific. Figure 4 presents how ESP language teaching is sometimes divided into different types and sub-types depending on focus.

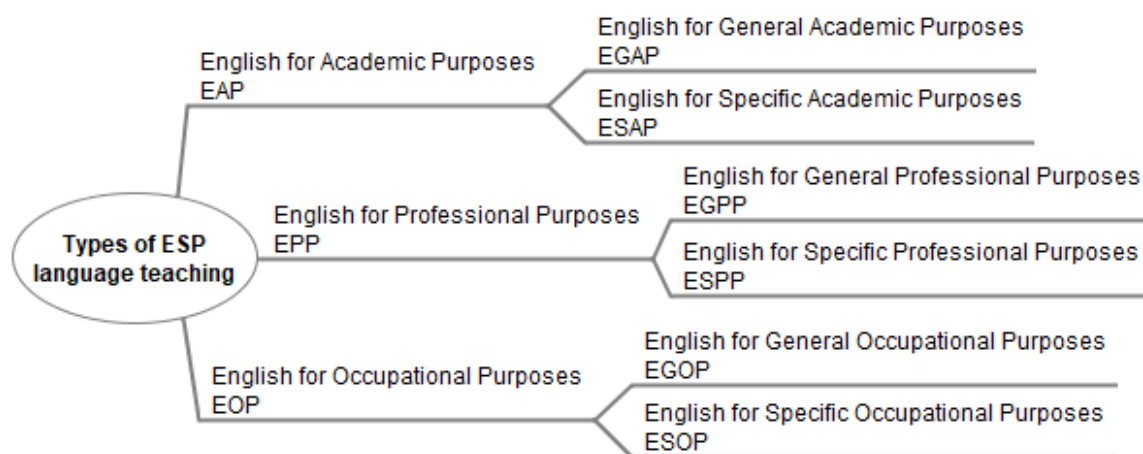


Figure 4. Types of ESP language teaching (based on Basturkmen 2010: 6)

At Lahti UAS, most ESP language courses can be categorized as being of the general variety. Some ESP language teaching, however, is occasionally integrated with subject-specific courses (e.g. information technology) taught in English. This can, for example, be in the form of joint assignments or even co-teaching by a subject teacher and an ESP language teacher. This can be seen as a variation of *Content and Language Integrated Learning* (CLIL) (see e.g. Gollin-Kies et al. 2015: 45–46). Integration is, indeed, one common answer to the question of how to teach English for specific purposes to learners studying highly specialized subjects (Lesiak-Bielawska 2015: 5–6).

Since ESP language courses should relate to learners' needs, any research on ESP language teaching should note needs analysis. Needs analysis identifies the language and skills needed, which further determine course content. It usually includes *target situation analysis* (what the learners need to know and should be able to do) and *present situation analysis* (what the learners know/do not know and can/cannot do). Needs analysis also aims to identify ways to learn the skills and the language needed in target situations. The information is then used for deciding the content and methods of the course. Finally, needs analysis is also used in refining already running courses. (Basturkmen 2010: 17–19; 26.) In this study, research question 2 relates to needs analysis.

Although the objectives of ESP language teaching have varied over the years, ESP language learners have been expected to acquire language and communication skills needed in professional settings and to learn to understand the linguistic features, genres, and concepts of the professional field in question (Basturkmen 2006: 5–6). That is, as was noted in the introduction, ESP language teaching aims “to teach underlying knowledge” and develop students’ “knowledge of [...] disciplinary concepts” (Basturkmen 2006: 137). This is where terminological methods can prove useful for ESP language teaching.

2.3 Experiential learning and ESP

Modern ESP language teaching relates to experiential and constructivist teaching practices. For example, the course assignment I designed to introduce terminological methods draws on the *experiential learning cycle*, which emphasizes the interrelation between action, reflection, experience, and abstraction in the learning process (Kolb & Kolb 2017: 10–11). Figure 5 illustrates the learning cycle and its four key components.

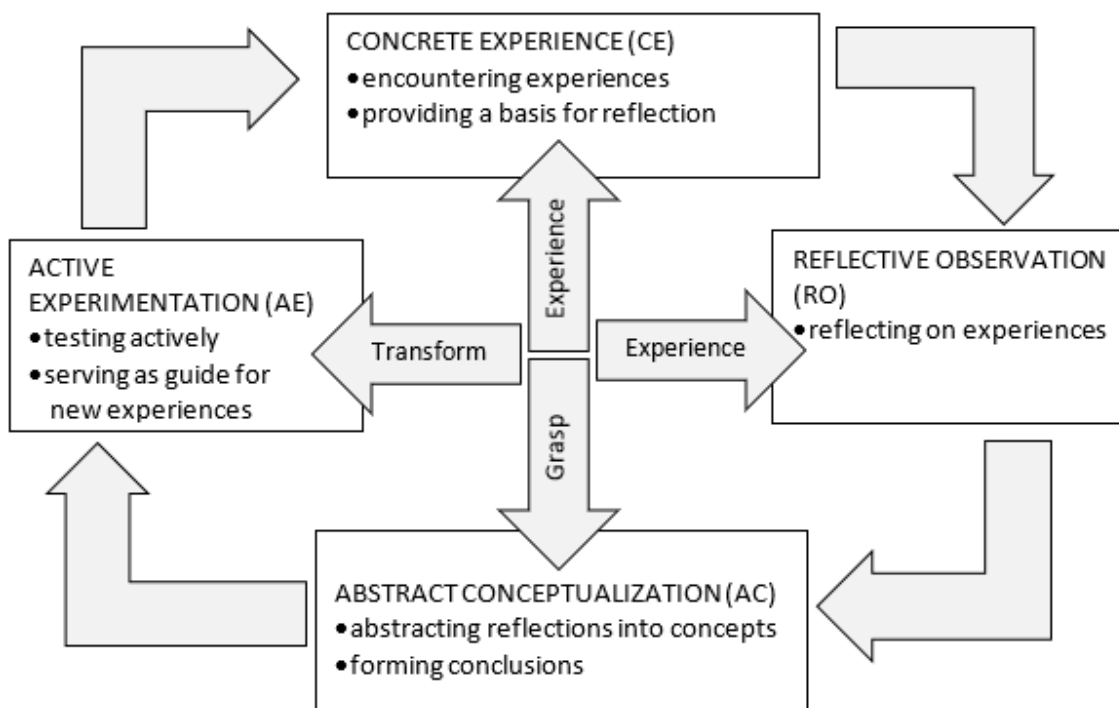


Figure 5. Experiential learning cycle (based on Kolb & Kolb 2017: 11)

The experiential learning cycle presents learning as an iterative rather than a linear process (see Kolb & Kolb 2017: 15). Learners experience something (CE) and reflect on it (RO). They then process what they reflected on and draw results (AC). Finally, they actively use the acquired knowledge and keep testing it (AE) and create new experiences. In this study, the entire cycle was experienced during the assignment process. To gain experience, my students first practiced how to use terminological methods to examine a professional topic and to give a presentation about it (CE). They then discussed and worked on the assignment in workshop sessions and, at the end of the course, answered an online questionnaire about the learned methods (RO). Finally, based on what they had learned (AC), they started using terminological methods (i.e. visualized concept systems and wrote concept definitions) and gave their presentations in English (AE).

Overall, the experiential learning theory is based on the work of David A. Kolb. Kolb (1984: 38; original italics) defines learning as “*the process whereby knowledge is created through the transformation of experience.*” Experiential learning, moreover, creates a relationship between the learner, the teacher, and the studied subject. This sometimes allows learners to question expert viewpoints, and the teacher, too, may become a learner in the process. (Kolb & Kolb 2017: 15–16.) This reminds the often noted approach adopted in ESP language teaching where the teacher is more like a facilitator, not a teacher-expert, and relies on learners’ existing knowledge (see e.g. Dudley-Evans & St John 1998: 13; Knutson 2003: 55; Tarnopolsky 2012: 8; Lesiak-Bielawska 2015: 10). More specifically, such ESP language teaching actively allows learners to use the subject-specific knowledge they already have and actualize this to learn English (Basturkmen 2006: 139).

Drawing on the idea of experiential learning, Tarnopolsky (2012:15) has introduced the so-called *constructivist blended learning approach* to ESP language teaching:

The constructivist blended learning approach to ESP teaching/learning at tertiary schools gives students opportunities of "constructing" themselves their own knowledge and communication skills in English through experiential and interactive learning activities [...]. [T]he idea [...] is the same as in learning by doing - teaching languages not through theory but through practical experience [...]. (Tarnopolsky 2012: 15, 20; original italics removed.)

Such ESP language course activities can simulate real interaction, and practicing (i.e. experiencing) this ideally results in language acquisition and learning communication skills in English. Tarnopolsky (2015: 158–161) has listed the following as examples of experiential learning activities: 1) role-playing professional situations, 2) brainstorming professional topics, 3) working on case studies about professional topics, 4) discussing professional topics, 5) giving presentations about professional topics, 6) searching for extra-linguistic information, 7) writing professional papers, and 8) doing project work. In this study, and the course assignment I created, especially 2, 4, 5, 6, and 8 apply.

Experiential-type ESP language course activities can be and are often organized as project-like coursework. Referring to experiential learning, Knutson (2003: 56–59), for instance, identifies the following phases in such tasks: “exposure, participation, internalization, and dissemination.” The exposure phase introduces the project and aims to activate previous knowledge. The participation phase focuses on the actual activity, the experience, of getting the project done. The internalization phase is about reflecting on the learning experience, and the teacher should help learners do this. The dissemination phase, then, connects the classroom experiences to real-world practices.

The course assignment I designed is a project-like task that draws on the idea of experiential learning. The exposure phase involves giving a lecture and introducing the assignment. The participation phase involves working on and finishing the project; that is, creating satellite models and writing concept definitions in English. The internalization phase is about reflecting on the project in workshop sessions during and at the end of the course. Finally, the dissemination phase is about connecting the project to real-world communicative practices, in this case giving a professional presentation in English. The assignment is introduced in detail in chapter 3.6

3 TEACHING TERMINOLOGICAL METHODS

Chapter 2 introduced English for Specific Purposes (ESP) to present the first half of the research framework. This chapter provides the second half. The aim is to create a basis for teaching terminological methods and related content in the context of ESP language teaching. The chapter discusses topics such as concept systems, concept relations, concepts definitions, and mind maps and concept maps, all relevant to the course assignment I designed. To connect all this with practice, the subchapters give examples of the teaching materials. Finally, in connection with systematic concept analysis, the last subchapter (3.6) introduces the course assignment.

3.1 Terminology training and its relevance to ESP language teaching

Before discussing the elements of terminology training, it is important to first define the concept of *terminology work*. ISO 1087 (2019: 3.5.1; original boldface) defines it as “work concerned with the systematic collection, description, processing and presentation of **concepts** (3.2.7) and their **designations** (3.4.1).” Its end products are terminological vocabularies, which can be mono-, bi-, or multilingual. Standardization to harmonize concepts and concepts systems is also a key activity. (Nuopponen 2003b: 226.) Terminology work is often organized as terminology projects, which include key steps such as identifying concepts, collecting and recording data, establishing term lists, mapping concept systems, writing concept definitions, selecting and forming terms, and visualizing concept relations (Suonuuti 2001: 33). Professional terminology work, evidently, requires training and expertise.

Terminology training is offered in various settings and for various target groups. In addition to being an integral part of university-level degree programs (see e.g. Nuopponen 2019) and being offered in academic contexts, terminology training is also offered in nonacademic settings on short courses where the target groups might be, for example, practicing translators, subject field specialists, special language teachers, terminology consultants, or language planners and others (Picht & Acuña Partal 305–308). Despite

such variety, Picht and Acuña Partal (1997: 309–311) have identified what they consider as the basic components commonly covered in terminology training. They list the following ten topics:

- 1) an introduction to terminology
- 2) the aims and objectives of terminology
- 3) the disciplines that contribute to terminology
- 4) basic concepts in terminology
- 5) object and concept
- 6) terms and other forms used for representing concepts
- 7) terminography
- 8) the process of terminology management
- 9) terminology and information and documentation
- 10) terminology and standardization

Considering ESP language courses, the list is too extensive. Out of the ten, 1, 2, 4, 5, and 6 provide a good starting point for integrating terminology training into the ESP context.

First, introductory components, Topic 1, could be included to familiarize ESP language learners with the topic. Picht and Acuña Partal (1997: 309) state that the components may be quite diverse depending on students' background, information level, and expectations. Regarding the aims and objectives of terminology, Topic 2, they list four subtopics out of which three could be relevant to ESP language teaching: "improvement of the quality and reliability of communication within the special field; knowledge transfer; linguistic and subject-field-specific knowledge" (Picht & Acuña Partal 1997: 309). In fact, these could be the overall learning outcomes of almost any ESP language course. Topic 4, basic concepts in terminology, refers to defining *concept* and *term* and their relation. While explaining topic 5, Picht and Acuña Partal (1997: 310) list several subtopics out of which the following seem relevant to ESP language learners: "basic definitions and explanations; relations among concepts; concept systems." These need to be covered if a course includes assignments that require students to analyze concepts and concept relations and create concept systems. Finally, regarding topic 6, terms and other forms used for representing concepts, Picht and Acuña Partal (1997: 310) list eight different subtopics: term formation, requirements and types; neology; relations between concept and term; synonymy; polysemy; homonymy; equivalence; term systems. Of these, especially the relation between a concept and term should be covered.

In addition to the ten basic elements of terminology training, Picht and Acuña Partal (1997: 311–314) list ten optional ones. Out of these, the following component could be relevant to ESP language courses, especially business-related ESP language courses: terminology, professional communication, special languages, and knowledge transfer. That is, as Picht and Acuña Partal (1997: 313) explain, this component has to do with “the description of the communication process in enterprises, institutions, etc., and seeks to demonstrate the multifaceted role of terminology [...]” On ESP language courses, especially business-related ESP language courses, some focus could be given on communication processes in businesses and other organizations, the role of terminology in professional communication, information management, knowledge transfer, and storing knowledge for business purposes.

While the above concerns terminology-related topics that could be introduced in the context of ESP language teaching, didactic methods need to be noted, too. Picht and Acuña Partal (1997: 317–319) list the following eight used in terminology courses:

- 1) lectures
- 2) practical exercises
- 3) projects
- 4) terminological role-playing
- 5) demonstrations of computer-aided terminology management
- 6) computer-aided instruction (e.g. translation)
- 7) terminological “map-maneuver” exercises
- 8) terminological theses

The list partly reminds Tarnopolsky’s (2015: 158–161) list of experiential ESP language course activities presented in chapter 2.3. For example, ESP language course activities are often organized as practical exercises and projects, and role-playing is common.

Out of the above eight, 1, 2, 3, and 4 could be used in ESP language teaching. As Picht and Acuña Partal (1997: 317) note, lectures (1) are for presenting the related theoretical topics. In the ESP context, this would mean explaining the concepts of *concept* and *term* and introducing some *concept relations*. Regarding practical exercises (2) and projects (3), an ESP language course could include a small project that aims to identify and define certain concepts and terms used in a professional field. Finally, some form of

terminological role-playing (4) could be useful. Picht and Acuña Partal (1997: 317) explain that this involves simulating communication between experts and terminologists. In the ESP context, terminological role-playing could relate to professionals explaining certain professional concepts to clients. Table 3 below summarizes the topics and methods relevant to ESP language courses.

Table 3. Terminology topics and didactic methods relevant to ESP language courses (based on Picht & Acuña Partal 1997: 309–311, 317–319)

Key topics	
1) Introductory components to familiarize students with the topic	
2) The aims and objectives of terminology	<ul style="list-style-type: none"> • to improve the quality and reliability of communication • to improve knowledge transfer • to increase linguistic and subject-field-specific knowledge
3) Basic concepts defined	<ul style="list-style-type: none"> • to define term, concept, referent
4) Object and concept	<ul style="list-style-type: none"> • to give basic definitions
5) Terms and other forms used for representing concepts	<ul style="list-style-type: none"> • to explain the relation between concept and term • to explain concept relations and systems
Key didactic methods	
1) Lectures	<ul style="list-style-type: none"> • to present the theoretical components
2) Practical exercises and projects	<ul style="list-style-type: none"> • to do a small-scale terminological project to identify and define certain concepts used in a professional field
3) Terminological role-playing	<ul style="list-style-type: none"> • to simulate experts explaining professional concepts to certain audiences, for example, business clients

The lecture materials introduce some of the key topics listed in Table 3. The contents are summarized on the following page.

The course assignment I created can be described as a course project. The aim is to map concept systems and write concept definitions in English. The assignment requires students to examine a professional topic this way (i.e. by using terminological methods) and, finally, to give a professional presentation about the examined topic in English. Although professional communication is simulated throughout the assignment, terminological role-playing as such is not part of it. The course assignment is discussed in detail in chapter 3.6

The lecture slides I created introduce the relation between concept, term, and referent, and they explain certain concept relation types. The slides also introduce how to visualize concept relations and explain why knowing about all this is relevant to my students. Table 4 summarizes the contents of the lecture materials.

Table 4. Lecture materials to introduce terminological methods

Key lecture slides	Purpose
What is systematic concept analysis?	To introduce the basic relation between <i>term</i> , <i>concept</i> , and <i>referent</i> by showing an example of the semantic triangle.
A concept, a referent, a term	To further explain <i>term</i> , <i>concept</i> , and <i>referent</i> .
What is systematic concept analysis?	To show the semantic triangle again with examples related to the students' specific fields of study, including an example of a simple concept definition.
Different types of concept relations	To present a list of concept relation types and focus on the ones considered most useful.
Type	To explain type (i.e. generic) relations.
Parts	To explain part (i.e. partitive) relations.
Origin	To explain origin relations.
Time	To explain time (esp. process) relations.
Movement	To explain movement (i.e. transmission) relations.
Action	To explain action (i.e. activity) relations.
The satellite model	To explain the key idea of the satellite model.
Using a mind mapping application	To give instructions on how to install Freemind, a free mind mapping tool, to visualize concept relations.
Writing concept definitions x 2	To instruct how to write concept definitions in English.
How is this relevant to us? Why is all this useful?	To motivate students to understand how analyzing concepts is relevant to their professional development.

I will discuss the topics summarized in Table 4 in the following four subchapters. The next subchapter, chapter 3.2, introduces *term*, *concept*, and *referent* as well as *concept definition*. Subchapter 3.3 proceeds to examine different concept relation types, and subchapter 3.4 discusses writing concept definitions. Finally, subchapter 3.5 explores mind maps, concept maps, and the satellite model to give some background the importance of creating visual representations of concept systems. Each subchapter builds on related theoretical and other sources and includes examples of the lecture materials.

3.2 Basic concepts of terminology work

The key elements of terminology work are the following: (1) *concept*, (2) *object/referent*, (3) *concept definition*, and (4) *term* (Suonuuti 2001: 13). To introduce these to my students, I created the slide based on Suonuuti's (2001: 13) work illustrating how the four concepts relate to each other. Image 1 is a screenshot taken of the lecture materials.

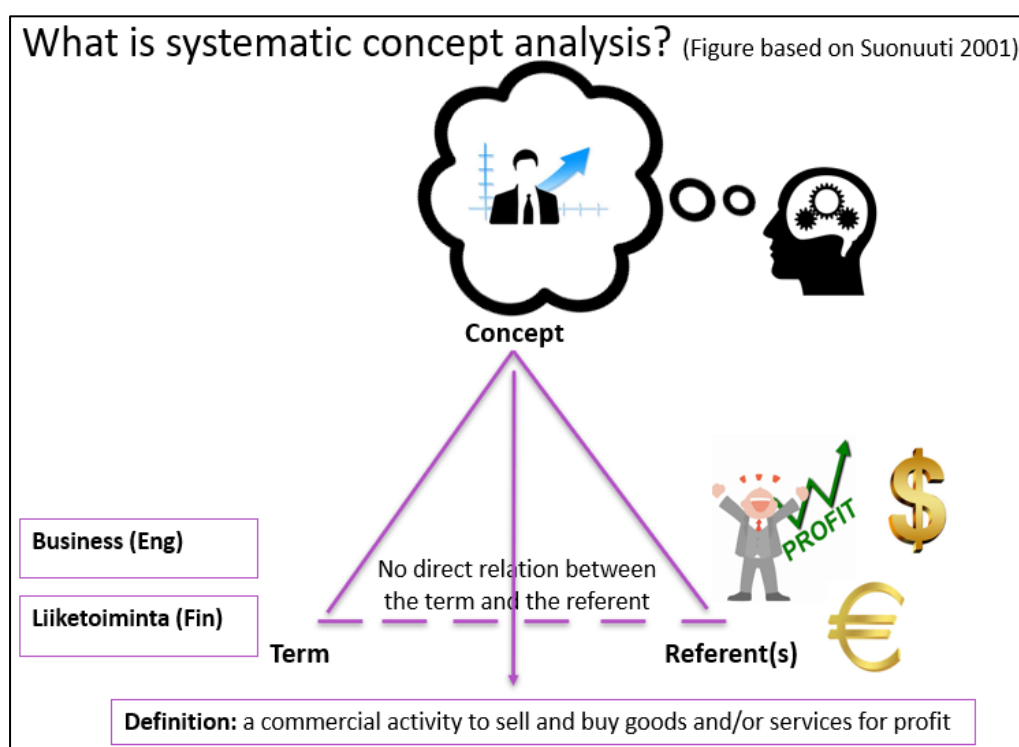


Image 1. Screenshot of the lecture materials: the four basic concepts

Objects/referents exist in or relate to the world at the level of reality, at *the ontical level* (Nuopponen 1994: 238). They can be concrete (e.g. a university building) or abstract (e.g. English for Specific Purposes). Concepts, then, are mental representations based on properties humans identify in objects/referents. These properties are abstracted to characteristics in the human mind to form concepts. Characteristics can be essential or delimiting: essential characteristics are needed to understand a concept, and delimiting characteristics differentiate a specific concept from others. Concepts, furthermore, can be divided into individual and general concepts. (Suonuuti 2001: 12–13; see also ISO 1087 2019: 3.2.8, 3.2.9.) Individual concepts refer to individual objects/referents that, at the

level of expression, are designated by proper nouns (e.g. Lahti University of Applied Sciences), or other designations (e.g. codes, numbers, etc.), whereas generic concepts refer to any number of objects/referents (e.g. university). Terms designate concepts and exist at *the level of expression* (Nuopponen 1994: 238). A term can be an individual word, a compound, or a similar expression, a phrase, or an acronym. Although terms are usually nouns, they can also be adjectives or verbs. (Haarala 1981: 16–18; Suonuuti 2001: 31.) In this thesis, for example, *ESP language teaching* is a term designating the concept of *teaching English for specific purposes*. Finally, concept definitions are important as their quality is essential to terminology work (Suonuuti 2001: 19).

Since the lecture was given to students in the Faculty of Business and Hospitality Management, the semantic tetrahedron shown in the lecture slide was designed to arouse their interests. The slide explains *concept* and *referent* by using visualizations related to business. *Referent* is visualized with currency symbols for the Euro and the US Dollar and with a cartoon-like businessperson exited for earning profit. *Concept*, then, is visualized by showing an icon of the human head that includes cogwheels in place of the brain to represent cognitive processes as well as a thought bubble to represent thinking. Moreover, to signify the concept of business, the thought bubble includes a picture of a businessperson and a chart showing an upward trend. Both *term* and *definition* are perhaps more self-explanatory as they are both linguistic entities; they exist at the level of language. Regarding *term*, the slide shows that concepts are designated differently in different languages. Finally, *definition* is exemplified by a simple definition defining the concept *business*.

Before proceeding, some critique should be noted. Laurén, Myking and Picht 1997: 77–79; my translations) discuss the predecessor of the tetrahedron, the semantic triangle that joins *reference*, *thought*, and *symbol*, and point out that the tetrahedron includes “the often-forgotten language user.” However, they also remind that “traditional models give little to no role to *context*.” In addition, Temmerman (2000: 6) argues that “the full potential of the three elements of the semantic triangle was deliberately neither explored nor exploited.” That is, the world, language, and mind, and their interrelations, have been depicted in overly narrow ways. Nevertheless, in agreement with Nissilä (2008: 43), when

I created the lecture materials, I decided to refer to the semantic tetrahedron because of its visual simplicity. It provides a good starting point for introducing the four key elements of terminology and their connectedness in a compact visual form.

3.3 Concept systems and concept relations

Concepts exist in relation to each other and form concept systems. Nuopponen (1994: 237) explains that in terminological literature a concept system is defined as “a system of related concepts which form a coherent whole.” In terminological analysis, a subject field is divided into smaller and smaller segments that form closely related structures called *concept systems* (Nuopponen 1994: 50). While concept systems are often considered from a synchronic perspective, that they represent conceptual knowledge existing at a specific time, Nuopponen (2018: 454) points out that concept systems do change since knowledge changes. However, she also notes that “[f]reezing a concept system in a specific time is a solution for communication and other practical purposes [...]” (2018: 454). Regarding practice, organizing and defining concepts is particularly important for professionals: to do their work effectively, professionals need precise, well-defined concepts, and concept systems (Nuopponen 1994: 236).

Concept systems are based on concept relations. Nuopponen (2005:128–131; 2018: 456–457) divides concept relations into two main categories: *generic relations* (also called *logical relations*, *type relations* or *is-a relations*) and *ontological relations*. Generic relations are direct relations between concepts, and they are organized hierarchically from more abstract superordinate concepts (e.g. *teaching English for specific occupational purposes*) to more specific subordinate concepts (e.g. *teaching English for air traffic controllers*). Ontological relations, on the other hand, refer to indirect relations between concepts. More specifically, ontological relations are “simplifications of relations which are observed between individual objects in reality.” (Nuopponen 2005: 128–129; see also 2018: 456–463.) To simplify the lecture, I did not explain the difference between generic and ontological relations but simply referred to generic (or type) relations and other types of relations (e.g. origin, partitive, and temporal relations).

In her research, Nuopponen (e.g. 1994; 2005; 2006; 2007; 2014; 2018) has discussed and classified numerous concept relation types. Figure 6 is based on Nuopponen's work and includes the concept relations types I considered enough for the course assignment. The figure includes *generic relations* and six different *ontological relations*.

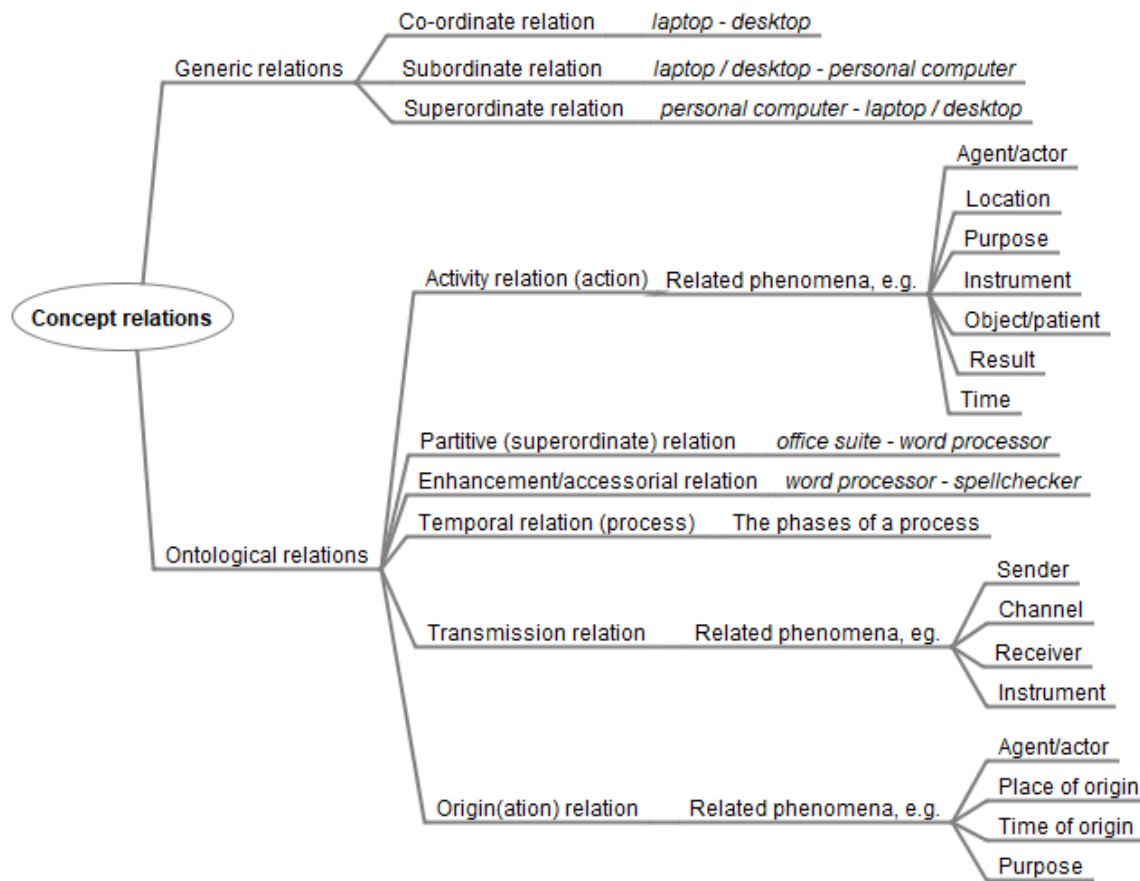


Figure 6. Concept relation types (based on Nuopponen 2005; 2006; 2007; 2011; 2018)

As Figure 6 shows, generic relations refer to types. For example, *laptop* and *desktop* are types of *personal computer*. They are co-ordinate concepts and exist at the same abstraction level. Each has its defining characteristics, but the two are also similar in that both can be defined as being personal computers. Subsequently, *personal computer* is a superordinate concept. A subordinate concept has all the characteristics that its superordinate concept has, but each subordinate concept also has delimiting characteristics that distinguish it from others. (Suonuuti 2001: 14; ISO 1087 2019: 3.2.5.) Identifying concept systems based on generic relations is important particularly for writing concept definitions because a specific subordinate concept is usually defined in

relation to its superordinate concept (e.g. *a laptop is a personal computer*) (see Nuopponen 2018: 458).

In addition to generic relations, Figure 6 includes the following six types of ontological relation types: *activity relation*, *partitive relation*, *enhancement/accessorial relation*, *temporal relation*, *transmission relation*, and *origination relation*. Already these six ontological concept relation types provide an excellent basis for analyzing and conceptualizing numerous real-world phenomena and for creating extensive, complex concept systems representing a knowledge structure.

Regarding the concept relation types, my lecture materials focus on generic relations, partitive relations, origination relations, process relations, transmission relations, and activity relations. (I also discussed accessorial relations with the *EfW IT* and *EfW BIT* students.) A screenshot of the introductory slide of this part of the lecture materials is shown in Image 2.

Different types of concept relations (käsitesuhteita)

1. **(TR) type (= generic relation, GR)**
2. **(PR) parts (= partitive relation)**
3. **(OR) origin (= origination relation)**
4. **(TimeR / ProsR) time / process (= temporal relation, TemR)**
5. **(MoveR) movement (= transmission relation, TransR)**
6. **(AR) action (= activity relation, ActR)**
7. Location (e.g. Europe – Finland)
8. Property (e.g. Finland – cold winter weather)
9. Accessory (e.g. email – attachment)
10. Material (e.g. Coca Cola – carbonated water)
11. Development (e.g. fetus – baby)
12. Causality (e.g. studying – learning)

The first 4 to 6 should be enough for our purposes
 (to learn more search for each concept relation type here: <http://tieteentermipankki.fi/wiki/Termipankki:Etusivu>)

Image 2. Screenshot of the lecture materials: concept relation types

To introduce **generic relations**, the lecture slide presents a question: “What concepts are close to the concept being defined?” The slide also explains that generic relations relate to types and visualize a concept system based on *business* as a central concept. Image 3 is a partial screenshot of the lecture slide defining the concept of generic relation.

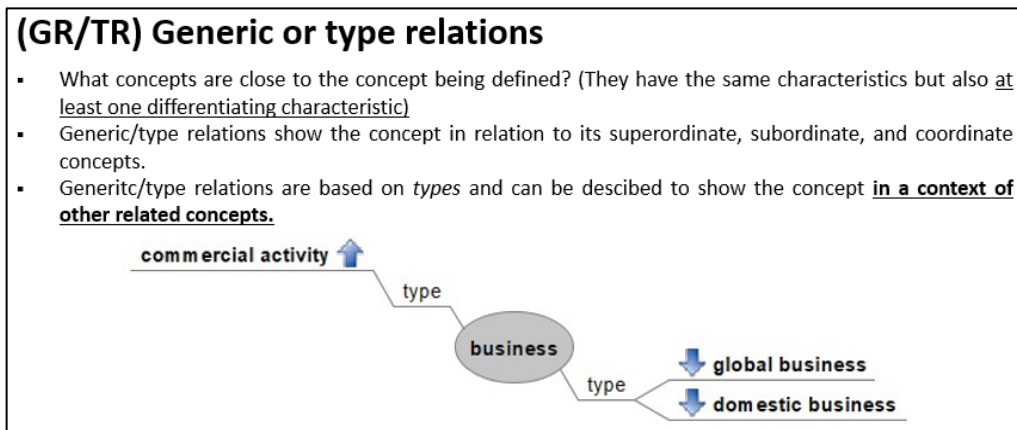


Image 3. Screenshot of the lecture materials: generic relation

Next, the lecture materials introduce **partitive relations**. These form part-whole systems, which can include subordinate and superordinate partitive concepts (as well as coordinate partitive concepts). A word processor application and a spreadsheet application, for example, are parts of an office suite package. (See Nuopponen 2005: 131–132; 2011: 8–9; Nuopponen 2018: 457, 460.) As Image 4 shows, the slide uses the expression “part relations” and gives an example by showing the different departments of a company as its parts.

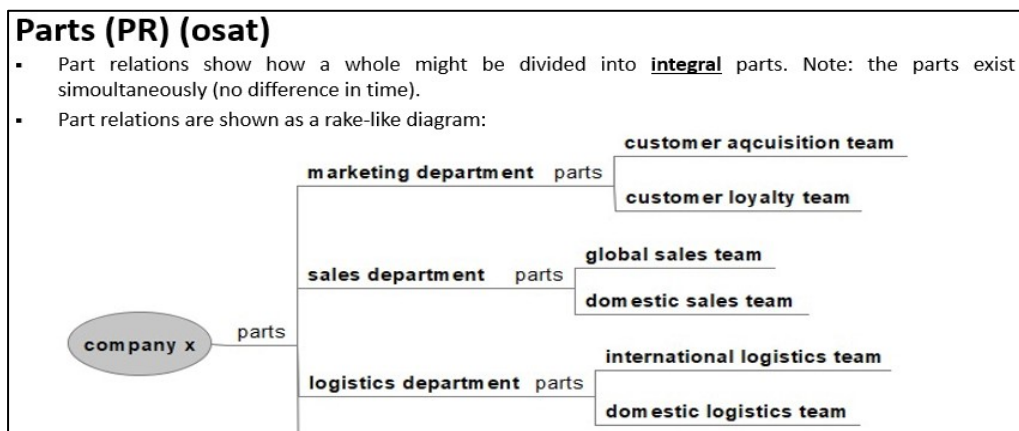


Image 4. Screenshot of the lecture materials: partitive relation

The lecture materials refer to **origination relations** as origin relations. These relate to the origin of an object. The related phenomena are, for example, the agent (originator), the place of origin, the time of origin, the instrument or tool used to produce the object, the materials used in the production, and the reasons for creating the object. (See Nuopponen 2005: 134–135; 2011: 9; 2018: 462–463.) The slide simply notes that origin relations “describe the origins of a thing or phenomenon” and refers to the related phenomena with interrogative pronouns (who, when, why, etc.). Image 5 shows a partial screenshot of the lecture slide defining the concept of origination relation.

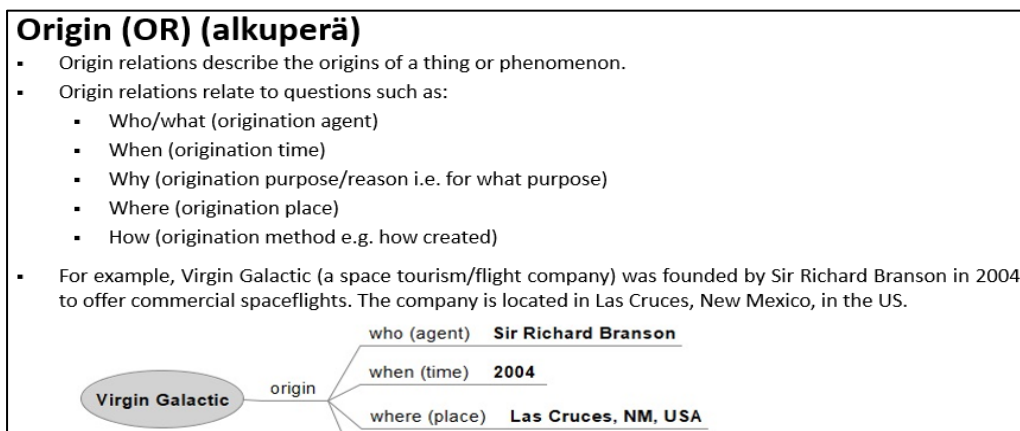


Image 5. Screenshot of the lecture materials: origination relation

It should be briefly noted that I chose the example, Virgin Galactic, simply because the company operates in an interesting niche field of business (commercial space travel) but also by noting the target audiences (i.e. business, information technology, and tourism and hospitality management students). The example could be interesting especially to tourism and hospitality management students but also works well with others.

After explaining the concept of origination relation, the lecture materials discuss **temporal relations**. Temporal relations can be divided into two types: temporal relations describing the different stages of a process, a **process relation**, and temporal relations describing people or things following each other sequentially. In addition, **transmission relations** form processes in which something is transmitted or given from A to B. For example, submitting a course assignment to an online learning platform is an example of this kind of process. More specifically, this is a **sequential transmission relation**, which

includes a sender (*student*), an intermediary (*online learning platform*), and a receiver (*teacher*). (See Nuopponen 2005: 133–134; 2007; 2011: 11–12; 2018: 460, 463.) As Image 6 reveals, the lecture slide refers to temporal relations as “time relations”. In fact, the lecture slide presents time relations primarily as process relations; the part of the lecture slide shown in image 6 describes a process relation and gives *Google search* as an example. The slide is from the lecture materials used on the *EfW IT* and *BIT* courses.

Time (Timer / Prosr) (aika / prosessi)

- Time relation systems are similar to part relation systems. The key difference is that the parts follow each other in time.
- Time relation systems are useful, for example, in describing processes and their steps.
- For example, doing a Google search is a sequential process that can be illustrated as shown in the below image.

Google search

time/process

- 1 Go to www.google.com
- 2 type in your search word or phrase
- 3 browse through search results
- 4 click a link to open a website

Image 6. Screenshot of the lecture materials: process relation

In addition, the lecture slides also illustrate a transmission relation. As Image 7 shows, the slide refers to this as “movement relation”. The visualization in the slide illustrates the concept of money transfer.

Movement (MoveR) (siirto/transmissio)

- Movement relations are useful in describing when something is moved from one place to another. (The viewpoint here is slightly different from time relations but quite similar.)
- A movement relation system focuses on concepts that relate to the movement of an object.
- For example, money transfer could be illustrated as follows:

Money transfer

➔

customer deposits money

➔

money transfer operator

➔

overseas bank

➔

funds to receiver

Image 7. Screenshot of the lecture materials: transmission relation

Finally, the lecture materials introduce **activity relations**. Activity relations connect an activity concept and related phenomena. For example, the activity concept *teaching* can be connected to the following concepts: *teacher* (agent/actor), *classroom* (location), *educate* (purpose), *learner* (patient/object), and *learning* (result). When analyzing activity relations, the starting point is to answer some of the following questions: Who? Where?

Why? With what? When? How? (See Nuopponen 2005: 134; 2006; 2018: 462.) The slide refers to activity relations as “action relations”. Image 8 is a partial screenshot of the slide defining the concept of activity relation. It gives *selling* as an example.

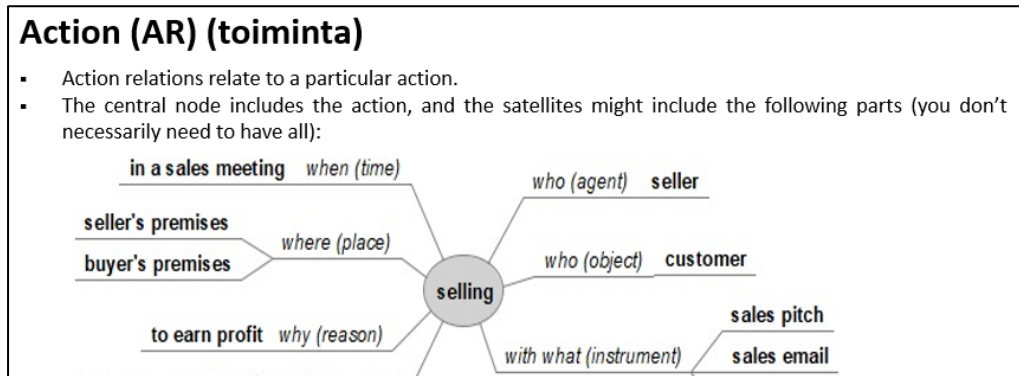


Image 8. Screenshot of the lecture materials: activity relation

To summarize, as was noted earlier, generic relations are important in writing concept definitions and need to be explained. Regarding the other relation types, the lecture materials do not refer to them as ontological relations but simply go on to explain them. I considered partitive relations useful for my students as this relation type can be used, for example, to examine organizations (e.g. companies) and identifying their parts (e.g. *marketing department – customer acquisition team; customer loyalty team*). Origination relations, then, can be useful when examining a company's or a product's history. Temporal relations (i.e. process relations and transmission relations) can be used to examine different kinds of business processes and operations. Finally, understanding activity relations help in analyzing different kinds of business activities (e.g. *selling*).

As the discussion reveals, the lecture materials are simplified. For example, although the slide shown in Image 2 lists 12 concept relation types, the lecture only discusses the first six. The other six (6–12), although useful, I considered as secondary for my students and the course assignment. Moreover, the terms for the introduced concept relation types are simplified, although the commonly used terms are also given. Each of the six concept relation types is introduced in its own slide, and each slide includes a visualization, a satellite model example, to illustrate how to represent such a concept system. This observes Picht and Acuña Partal's (1997: 310) note that both verbal and non-verbal representations of concepts should be provided.

3.4 Concept definitions

Writing concept definitions is part of terminology work. A definition includes delimiting characteristics to differentiate the concept from others; a definition classifies the concept in a concept system (Suonuuti 2001: 19; Nuopponen 2003b: 226). In addition to having delimiting characteristics, a concept definition relies on a superordinate concept, which has the basic defining characteristics and places the defined concept in a specific context (see the earlier example: *a laptop is a personal computer*). This is called an *intensional definition*, which is the most common way to write concept definitions. Alternatively, an *extensional definition* lists “the objects covered by the concept to be defined.” (Suonuuti 2001: 20–21; see also ISO 1087: 2019: 3.3.2, 3.3.3.)

The lecture materials discuss concept definition writing. I instructed my students to write concept definitions by defining concepts based on broader concepts (i.e. superordinate concepts). In addition, I wanted the definitions to be grammatically complete sentences so that, for example, a linking verb *to be* in the present simple tense would connect the defined concept with the broader concept, and a relative clause would give the delimiting characteristics. Image 9 combines screenshots taken of two lecture slides about the topic.

Writing concept definitions

- Concept definitions should be based on systematic concept analysis, and they should be short, easy to understand, and grammatically good.
- Pay attention to the following language points:
 - 1) No article (a/an/the) in front of the concept

Company		
2) [narrower concept]	is	[broader concept] < present simple tense
A company	is	an organization that...
Virgin Galactic	is	a company that

Company (< a concept, no article used)
 A company is an organization that does business to gain profit and may have several departments such as a marketing department, a sales department and an administration department. (< a concept definition)

Image 9. Screenshot of the lecture materials: writing concept definitions

The upper part of Image 9 is a partial screenshot from a lecture slide that gives writing instructions based on the idea of writing intensional-type concept definitions. The bottom

part with the dashed line is a partial screenshot from a lecture slide that gives concept definition examples. It should be noted that the examples are different from definitions commonly created in terminology work and, for example, included in terminological vocabularies. Suonuuti and ISO 1087:2019, for example, give the following examples:

tree

tall *plant* with hard self-supporting *trunk* and branches that lives for many years

coniferous tree

tree with needle-formed leaves and exposed or naked seeds

(Suonuuti 2001: 21; original boldfacing and italics)

EXAMPLE 1: optical mouse: computer mouse in which movements are detected by light sensors.

EXAMPLE 2: mechanical mouse: computer mouse in which movements are detected by rollers and a ball. (ISO 1087:2019: 3.3.2; original capitalization)

These are all economical and do not form grammatically complete sentences. Moreover, the superordinate concepts (*plant*, *tree*, and *computer mouse*) do not take an indefinite article as such countable nouns normally do, and the defined concepts and all definitions are written in small-case letters. Regarding the conciseness of concept definitions, Suonuuti (2001: 23; italics added for emphasis) maintains that a definition “should contain *only* information required to place the concept correctly in the concept system” and that additional information is, for example, given in a note.

I wanted my students to write concise concept definitions in their own words or by paraphrasing and citing sources. Moreover, I wanted the students to pay attention to writing grammatically complete and accurate sentences in English. Therefore, as Image 9 shows, my example definitions are full sentences. I instructed not to use an article with the listed concepts but, in contrast to common concept definitions such as the above from Suonuuti and ISO1087: 2019, to write the concepts in capital letters. Finally, although not shown in Image 9, related to Suonuuti’s (2001: 23; see also Suonuuti 2001: 30) point about giving additional information in a note, my lecture materials point out that concept definitions may include additional information, for example, images or diagrams.

3.5 The satellite model

The course assignment, which I discuss in the next chapter, requires students to visualize concept systems by creating satellite models. To provide background, the following first introduces concept maps and mind maps and then moves on to discuss the satellite model.

Mind maps represent semantic or other connections and usually include a central topic and branches with text. They may also include images and use colors, and they are usually read center-out. (Eppler 2006: 202–203; Nuopponen 2016: 197.) Moreover, mind maps can be said to be based on spontaneous thinking, and they are useful for brainstorming (Davies 2011: 281–282). They are structurally organic (Nuopponen 2016: 197).

Concept maps, on the other hand, are more formal. They present a hierarchical tree structure (Davies 2011: 282) and illustrate relationships between concepts as is presented in Figure 7, which is a partial concept map about concept maps.

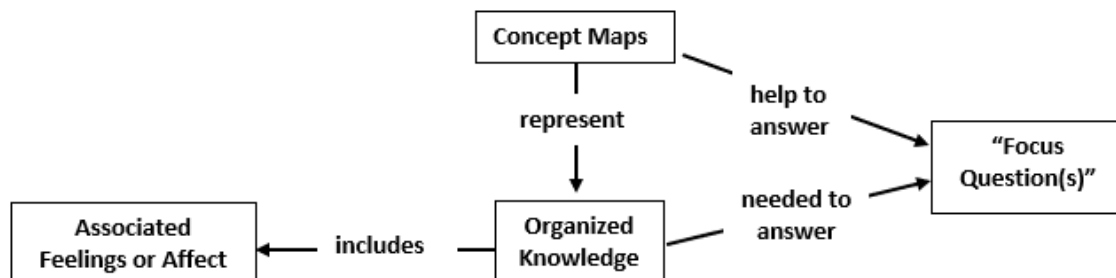


Figure 7. Example of a concept map (edited from Novak & Cañas 2008: 2)

A concept map starts from the main concept at the top; the less general ones are lower in the hierarchy. It has boxes or bubbles with text (or symbols) designating concepts and arrowed lines with linking words or phrases, usually verbs. These are common elements especially in “improved concept mapping”. Concept maps show systematic relations between concepts and can be useful for teaching, studying, or revising subject matter. They can provide versatile information about their creator’s thinking. (Kankkunen 1999: 7–8; Eppler 2006: 203; Novak & Cañas 2008: 1–2.)

Compared to mind maps, creating concept maps can be somewhat difficult for novices. However, the understandability of concept maps is usually higher. Mind maps are more creative but also more idiosyncratic. They are easy to extend, whereas the extensibility of concept maps is more limited. (Eppler 2006: 204, 206.)

The satellite model introduced by Nuopponen reminds mind maps and concept maps. She defines it as “a mind-map like knowledge and concept presentation” or, more narrowly, as “a type of visualization tool or method for terminological concept analysis” (2011: 5; 2016: 190). She started to develop it in terminology and communication studies’ courses at the University of Vaasa in the late 1980s because other methods were not flexible enough for presenting complex concept systems (Nuopponen 2016: 191–192, 196). The satellite model can represent one concept system or combine different ones (Nuopponen 2018: 464). According to Nuopponen (2016: 192), the satellite model draws on a visual metaphor different from other ways of representing concept systems, which are based on the upside-down tree metaphor (see Figure 7). Being flexible, it solves the need to have different ways to represent each concept relation type (Nuopponen 2018: 464).

The satellite model includes a central node (the core concept) and satellites (related concepts). The nodes are connected by concept relation types, which can be described metaphorically as the gravitational force keeping the concepts connected. (Nuopponen 2016: 192–193: see also Nuopponen 2018: 463–466.) Image 10 shows a partial screenshot taken of the lecture slide that introduces the satellite model.

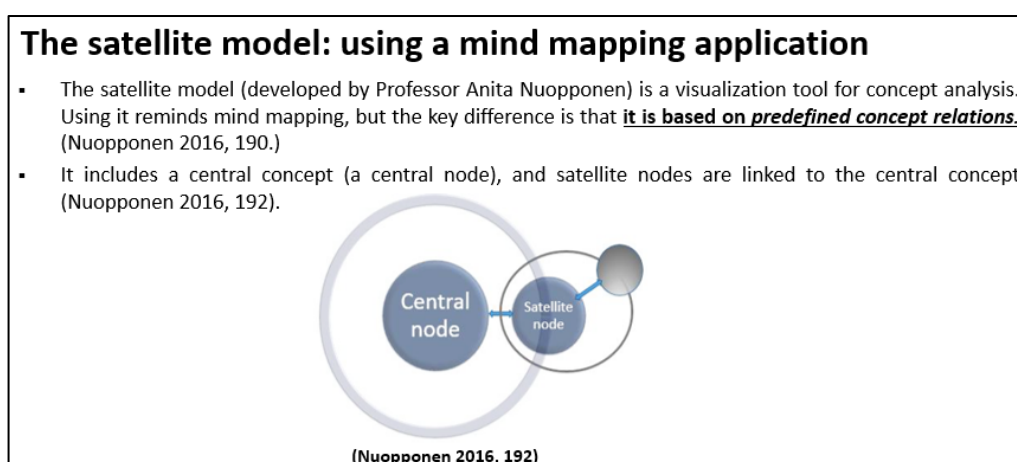


Image 10. Screenshot of the lecture materials: the satellite model

To emphasize its relation but also its difference to mind maps, it is noted in the slide that creating satellite models reminds mind mapping but is based on predefined concept relations. Moreover, referring to mind maps is intentional as most university-level students are familiar with the concept.

When creating a satellite model, the focus is usually on one concept at a time. This can be a higher-level concept (e.g. a concept somehow central to the analyzed field) that connects other concepts and concept systems. A well-crafted satellite model is clear, intelligible, transparent, and can be extended. (Nuopponen 2018: 464, 466.) A satellite model can be created in steps, and the different versions can vary in how extensive they are. Nuopponen (2011: 6) explains that the satellite model can at first resemble a mind map without identifying specific concept relations. This is *a preliminary satellite model*. Later versions of the satellite model are more precise, and the satellite model can be expanded in the process (Nuopponen 2018: 464).

After introducing the basic idea of the satellite model, I instructed how to install Freemind¹ (a free mind-mapping tool that can be used to create satellite models) and asked my students to test the tool. Nuopponen (2016: 197, 199) refers to Freemind, and also MindManager®, and explains that mind mapping software may offer features (e.g. they may allow adding notes, images, and symbols) that improve the usability of satellite models. In addition, recommending and using Freemind is based on my experience of learning to use the tool on terminology courses at the University of Vaasa, for example on the *TEVI3002 Concept Analysis* course and the *TEVI3008 Terminological Project* course (see Univaasa 2016: 5, 8).

Finally, each of the four ESP language courses had a workshop-type session or two during which I helped my students with their satellite models as they were working on the course assignment. The following chapter introduces systematic concept analysis and explains how I integrated it into the course assignment process.

¹ Freemind is available for download through the following link:
http://freemind.sourceforge.net/wiki/index.php/Main_Page

3.6 Integrating systematic concept analysis into ESP coursework

Discussing technical communication education, Koskela and Isohella (2019: 99) point out that, to understand the variation of the conceptual structures of a specific field, students need analysis tools. In this study, I use systematic concept analysis compiled by Nuopponen as such a tool in the context of ESP language teaching. Nuopponen compiled it by drawing on the terminological analysis method and by including elements from research-focused concept analysis methods. Terminology work is one specific field that can use it, but systematic concept analysis could also be used, for instance, for research purposes. (Nuopponen 2010a: 5–6.)

The analysis process has several steps according to Nuopponen. She has identified the six steps shown in Figure 8. However, she reminds that the process is not always as linear as the figure might suggest; rather, the steps usually overlap. (Nuopponen 2010a: 6.)

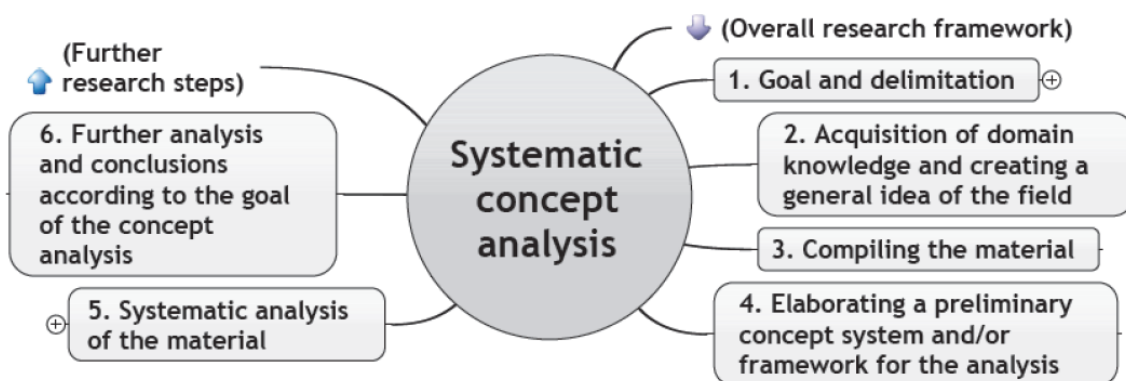


Figure 8. Six steps of systematic concept analysis (Nuopponen 2010a: 6)

In Nuopponen’s model, the aim in **step 1** is to define the purpose and limit the scope of the analysis. For example, the purpose may be to clarify concepts. **Step 2** is about gaining knowledge to understand disciplinary concepts. **Step 3** is about looking for material and information. This overlaps with steps 1 and 2 because sources should be collected right from the start. Moreover, the analysis can be *domain restricted* or *source restricted*. If it is domain restricted, collecting more accurate material starts after step 4. A source-restricted analysis focuses on finding out how a concept is described in specific sources. **Step 4** is about creating a preliminary concept system. Even if the analysis focuses on

one concept, others are involved. In **step 5**, the material is processed by keeping in mind the preliminary concept system created in step 4. The researcher elaborates concept systems and concept relations, examines synonymy and polysemy, and compares related concepts and their characteristics. **Step 6** summarizes and combines everything. After the analysis, the results are applied. Among others, the aim might be (1) to describe concepts, (2) to clarify differences and similarities between concepts, (3) to describe how concepts are used and to examine conceptual structures, (4) to develop concepts and concept system, or (5) to harmonize concepts and concept systems. (Nuopponen 2010a: 7–13.) Regarding my lecture materials, the analysis process is not explained as such, but the steps are embedded in the course assignment instructions and in doing the assignment.

Doing the course assignment is a small-scale ESP language course project that is based on systematic concept analysis. Figure 9 illustrates this.

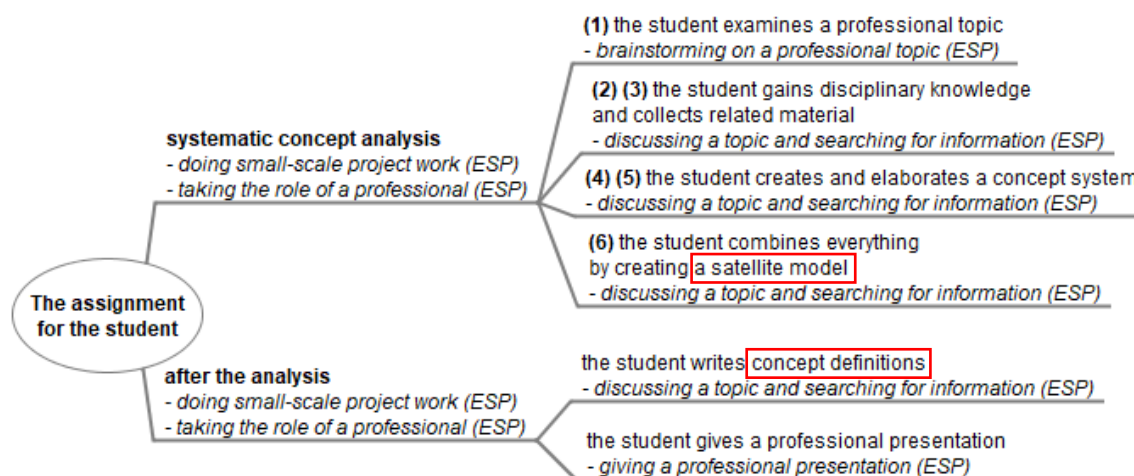


Figure 9. Course assignment process for the student

Step 1 of the process, examining a professional topic, first requires students to brainstorm and simulate the role of a professional. The remaining steps of systematic concept analysis, steps 2 to 6, require students to keep discussing the topic and searching for information. After the analysis process, when students present their analysis results by writing concept definitions and by giving presentations, they continue project work, simulate being professionals, and continue having discussions about their topic in English. All these are experiential-type ESP language learning activities listed, for

example, by Tarnopolsky (2012: 28). Finally, considering the present thesis, the collected and analyzed research data included students' satellite models and concept definitions. These are marked with rectangles in Figure 9. The following proceeds to go through the course assignment instructions in detail.

The course assignment draws on the learning outcomes stated in the Lahti UAS's faculty curriculum. While each course has three or four learning outcomes, only some are relevant to the course assignment. These are presented in Table 5.

Table 5. Learning outcomes to create the course assignment (LAB 2019b)

Course	Relevant learning outcomes to create the assignment
English for Work <ul style="list-style-type: none"> • <i>EfW IT</i> • <i>EfW BIT</i> • <i>EfW TOUR</i> 	The student is able to <ul style="list-style-type: none"> • recognise the different sources and tools to help them improve their English skills • understand the terminology and concepts of their own field
Global Communication in Business <ul style="list-style-type: none"> • <i>GLOBAL</i> 	The student is able to <ul style="list-style-type: none"> • identify aspects related to global corporate communication

Regarding the first learning outcome listed for *English for Work*, integrating terminological methods, especially writing concept definitions in English, into experiential-type coursework can help improve learners' language skills (see Tarnopolsky 2012). The methods also relate to the second learning outcome since they are specifically designed to help understand professional terminology and concepts.

In addition, terminological methods are useful for research. For example, systematic concept analysis can help in understanding the research topic and perspective; it can help in defining related scientific disciplines, theories, research paradigms, etc.; it can help in defining the aim of the research and in outlining the research process; it can help in mapping prior research and used concepts; it can help in organizing and analyzing research data; and finally, it can help in presenting a synthesis of research results. (See Nuopponen 2009: 2010a; 2011; 2020).

Using terminological methods for research relates to the *Global Communication in Business* course learning outcome presented in Table 5. Systematic concept analysis, the satellite model, and writing concept definitions can be used for identifying and defining aspects related to a specific professional topic (i.e. concept), in this case, *global corporate communication*.

Regardless of the course, however, and although the assignment instructions varied slightly from course to course, the key idea of the course assignment was to make my students use terminological methods and do small-scale research about a professional topic in English. That is, they had to do systematic concept analysis to study a professional topic, to create a satellite model of the topic, and to write concept definitions in English. Image 11 shows a partial screenshot of the assignment introduction for the *EfW IT* and *EfW BIT* version of the assignment instructions.

1) Assignment theme (=central concept)

- Study the systematic concept analysis material for our September 24 lesson.
- Choose an existing IT product or service you want to study as your theme/central concept. Start studying the product or service and finding related material.

2) Assignment instructions

Format, Audience, Topic, Purpose

*You work for an international IT company. Your superior wants you to prepare and later give a **presentation** in English about **the company's latest product or service innovation** aimed at some of **the company's international clients**. The presentation must be clear and concise and based on a **satellite model and your concept definitions**. You should make your **presentation informative but also appealing in order to promote the product or service**.*

Examine your theme (=central concept). Identify and find different kinds topics/themes (=concepts) related to it. **You might want to start this in Finnish. For example, start by checking if there's a Wikipedia page in English and in Finnish about your theme/main concept.** Generally Wikipedia is not an acceptable source, but in this case it's accepted.

Image 11. Screenshot of the course assignment: introduction

The assignment introduction defines the purpose and the scope of the analysis process: to examine an IT company's product or service and create a presentation that draws on a satellite model and concept definitions. This is step 1 of the systematic concept analysis process. The instructions also cover step 2 (to gain knowledge of the discipline) and step 3 (to collect material) of the process. The instructions imply a domain-restricted analysis

focusing on one main concept (see Nuopponen 2010a: 9). In addition, considering step 4 of the analysis process (to create a preliminary concept system), the instructions for *EfW IT* and *EfW BIT* expect students to identify four concept relation types.

The instructions in the screenshot in Image 12 overlap with step 5 of the systematic concept analysis process: elaborating concept systems and clarifying concept relations. Examining synonymy and polysemy, however, is not part of the assignment.

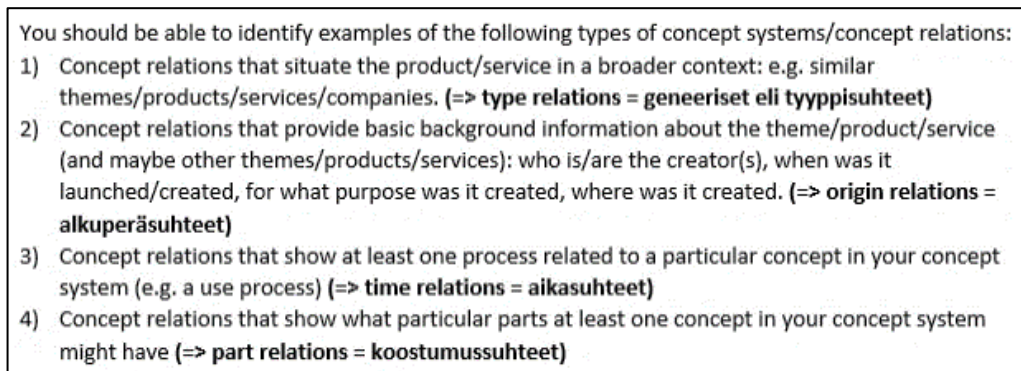


Image 12. Screenshot of the course assignment: concept relation types

Regarding step 6 of the process (to combine everything), the assignment requires students to create a satellite model that shows concept relations and systems related to the main concept (i.e. a professional topic). Image 13 is a screenshot of this part of the instructions.

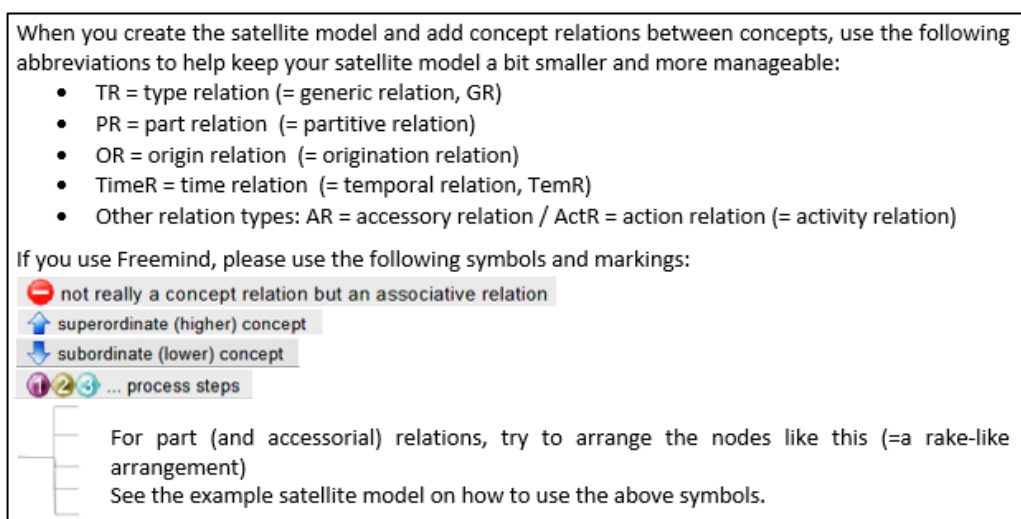


Image 13. Screenshot of the course assignment: concept relations, the satellite model

The symbols should help students create satellite models. There is also a symbol for what I have called *associative relation*. Students can use this if they want to include certain concepts but cannot identify the relation type, or if what is included is not a concept but additional information. Because I simplified the lecture materials, and they do not divide concept relations into generic, partitive, and associative relations (see Suonuuti 2001: 14–19; ISO 1087 2019: 3.2.13, 3.2.14, 3.2.23), *associative relation* in the instructions implies that such a relation is based on associating rather than analysis.

After the analysis process, students are required to write 10 to 20 concept definitions in English and give a presentation. In the context of English for Academic Purposes research, and regarding disciplinary knowledge, Woodward-Kron (2008: 246) notes that “students need to show their understanding of concepts, phenomena, relations between phenomena, etc. by incorporating the specialist language and terminology of their discipline into their writing accurately.” This is what writing concept definitions can help do. Image 14 combines screenshots of the assignment instructions for writing definitions and concept definition examples. The instructions draw on Suonuuti’s (2001: 21, 23) points that a definition “includes the delimiting characteristics needed to differentiate the concept from other related concepts” and definitions “shall be as brief as possible.”

- Create an alphabetical list of 10-15 concepts and write definitions/descriptions based on your analysis. Your definitions should be short, easy to understand and grammatically good.
- While a definition should be short, it should include ***characteristics that differentiate the defined concept from other similar concepts.***
- You may also include additional information (even images/diagrams etc) in your definitions/descriptions.
- Don't use articles (a/an/the) in listing the concepts.
- **Write the definitions in your own words.** If you paraphrase, remember to cite your source(s).

Computer hardware
Computer hardware is computer technology that consists of the physical parts of a computer such as the motherboard and central processing unit.

Google LLC
Google LLC is a technology company that was founded by Larry Page & Sergey Brin in 1998 to create a better search engine. It is headquartered in Menlo Park, California, in the US.

Image 14. Screenshot of the assignment: writing concept definitions

The next two chapters, chapters 4 and 5, proceed to discuss the data and results regarding my students’ course assignment products and views on terminological methods.

4 STUDENTS' COURSEWORK TO USE TERMINOLOGICAL METHODS

This chapter discusses my students' coursework focused on using terminological methods. To provide an initial idea, Table 6 lists their assignment topics. The *EfW IT* and *EfW BIT* students were free to choose the topics and focused on analyzing IT products or services. On the *EfW TOUR* course, on the other hand, the topics were suggested by a tourism and hospitality management lecturer. On the *GLOBAL* course, the topic was based on a required course reading.

Table 6. Assignment topics examined in the students' course assignment products

Course	Examined assignment topics
<i>English for Work IT</i>	Avast Antivirus (<i>Antivirus software</i> as a central concept) Netflix Nvidia Oneplus 6 (<i>Smartphone</i> as a central concept) Playstation Pokémon Go Spotify Total Learning ² Twitter WhatsApp (<i>Digital communication</i> as a central concept) YouTube
<i>English for Work BIT</i>	1Password Deezer (<i>Media streaming service</i> as a central concept) Everything Service ² Joomla (<i>Content management system</i> as a central concept) Snatchbot (<i>Chatbot</i> as a central concept) Ubuntu WordPress (<i>Content management system</i> as a central concept)
<i>English for Work TOUR</i>	Adventure tourism Bleisure tourism Customer experience Destination marketing Digital tourism Ecotourism Hospitality management Shopping tourism Sports tourism
<i>Global Communication in Business</i>	Global (corporate) communication

² This is not a real product although something similar exists. The student wanted to work on his own idea.

On the four courses, my students submitted a total of 43 satellite models and 40 concept definition documents. After having created satellite models and written concept definitions, the students gave presentations about the topics in English. The presentations are not part of the study.

To collect the assignment files, I asked the students to submit their satellite model files and concept definition files to the Moodle learning management platform. Image 15 shows a screenshot of this part of the *EfW TOUR* course Moodle page.

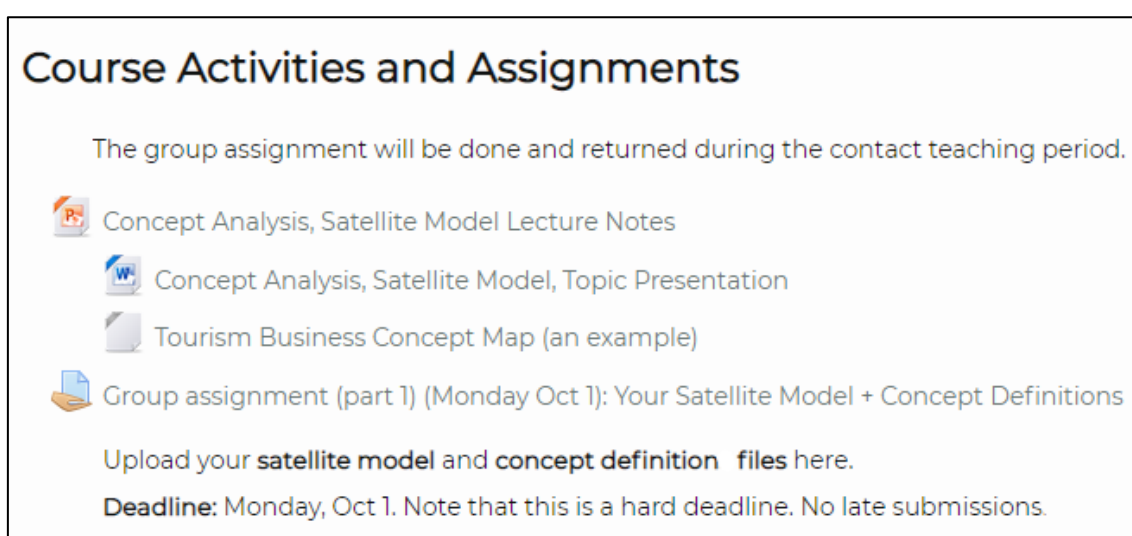


Image 15. Screenshot of the course assignment on the Moodle platform

Finally, it should be noted that on the *EfW TOUR*, *EfW IT*, and *EfW BIT* course the students worked in teams of four to six students, and on the *GLOBAL* course, they worked individually or in pairs. On each course, the students started working on the course assignment after my lecture, worked on the assignment outside of class time, and attended a workshop-type session or two to get additional help to create satellite models.

4.1 Method for analyzing students' assignments

To analyze the students' assignment products, I applied evaluative analysis, which is a method used in social research for qualitative text analysis (Kuckartz 2014: 65). The

analysis process is based on but adapted from Kuckartz (2014: 88–101) for this study. Evaluative analysis usually has seven phases as presented in Figure 10.

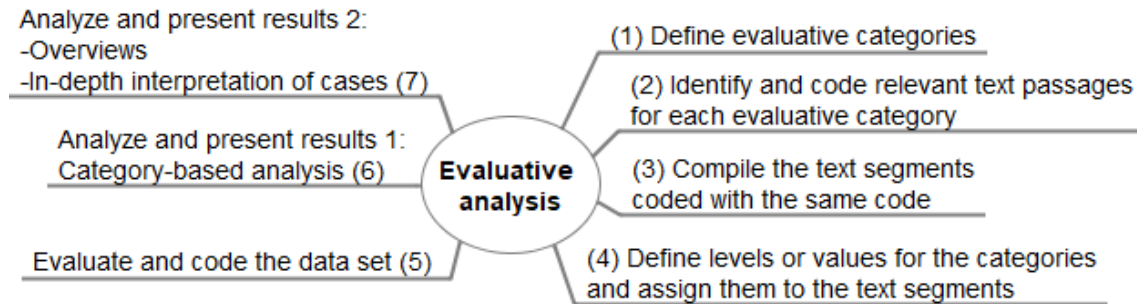


Figure 10. Seven phases of evaluative analysis (based on Kuckartz 2014: 89)

Regarding phase 1 of evaluative analysis and defining evaluative categories, in this study, the evaluative categories are simply based on the two types of assignment products: *Category 1: quality of satellite models*; *Category 2: quality of concept definitions*. Kuckartz (2014: 90) notes that evaluative categories should be connected to the research question. Analyzing the quality of the students' assignment products aims to answer the first research question of the study, which focuses on finding out what kinds of terminological products (i.e. satellite models and concept definitions) the participating students were able to produce as they were doing the assigned coursework.

As the data sets of this study are not traditional text passages (e.g. interview transliterations) the segments belonging to each evaluative category were obvious. The students' satellite models belong to *Category 1: quality of satellite models*; the concept definition documents belong to *Category 2: quality of concept definitions*. According to Kuckartz (2014: 90–91), phase 2 and 3 of evaluative analysis is about coding the collected text passages and compiling text segments coded with the same code, but in this study, these steps were not needed.

Phase 4 and 5 of the process, as they are applied in this study, focus on assessing the students' assignment products according to certain evaluative levels. To do this, I created the following four evaluative levels: *Level 3: thorough to extensive use of terminological methods*; *Level 2: some to thorough use of terminological methods*; *Level 1: some use of terminological methods*; *Level 0: very little use of terminological methods or cannot be*

classified. As Kuckartz notes (2014: 91), level 0 is needed in case some of the analyzed data include, for example, incorrect or unclear information. In addition, to assign a specific evaluative level to a course assignment product, specific characteristics are needed. The characteristics for evaluating the satellite models can be found in chapter 4.3.1 and for concept definitions documents in chapter 4.4.1.

Phase 6 and 7 of evaluative analysis involve presenting results and case examples. Regarding phase 6, the results are presented in bar charts and tables. Regarding phase 7, chapters 4.3 and 4.4 present case examples representative of each evaluative category and evaluative level. Figure 11 summarizes evaluative analysis as it is applied in this study.

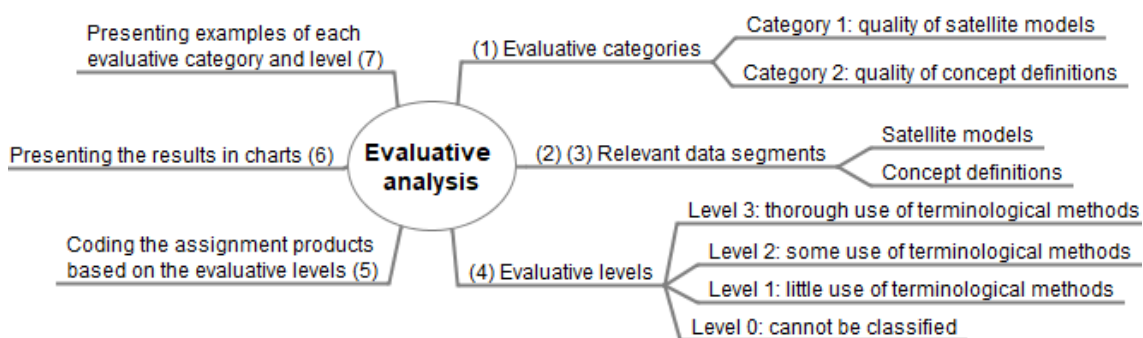


Figure 11. Phases of evaluative analysis (adapted from Kuckartz 2014: 89)

If the overall quality of the students' coursework is good, it can be concluded that the participating students learned to use terminological methods to examine professional topics and learned to make the acquired professional knowledge apparent. This, moreover, would support the idea of developing university-level ESP language teaching by integrating terminological methods into its teaching practice.

4.2 Evaluative analysis of the students' satellite models

This chapter presents the results of analyzing the students' satellite models. Chapter 4.2.1 explains the characteristics I used to assign the specific evaluative (3–0) levels to the students' satellite models. Chapter 4.2.2 presents quantified results in charts, and chapter

4.2.2 presents some qualitative results by discussing case examples from all four courses and belonging to each of the evaluative levels.

4.2.1 Characteristics to assign evaluative levels to satellite models

Table 7 shows the characteristics I identified and used in assigning the evaluative levels to the students' satellite models (i.e. Category 1 assignment products). An *EfW* satellite model that identified four or more various concept relation types and used two or more symbols was a Level 3 type satellite model and so on. The assignment carried more weight on the *GLOBAL* course. Therefore, a *GLOBAL* satellite model that managed to identify five or more different concept relation types and used two or more symbols was a Level 3 type satellite model and so on.

Table 7. Characteristics to assign evaluative levels to satellite models

<i>EfW IT, BIT & TOUR</i>	Level 3	Level 2	Level 1
Characteristic 1: number of various concept relations	≥ 4	3	≤ 2
Characteristic 2: use of suggested symbols (or similar)	≥ 2	1	0
<i>GLOBAL</i>	Level 3	Level 2	Level 1
Characteristic 1: number of various concept relations	≥ 5	3-4	≤ 2
Characteristic 2: use of suggested symbols (or similar)	≥ 2	1	0

In case of discrepancy, Characteristic 1 had more weight. However, both characteristics had to be present for a satellite model to be a Level 3 type. For example, if an *EfW* satellite model had four or more different concept relation types (=Level 3), or was otherwise very thorough, but no suggested symbols were used, it was a Level 2 type. Moreover, if a satellite model reminded a mind map or a concept map, or did not include concept relation nodes, or did not show concept relations in any other way, or many of the concept relations were somehow incorrect, the satellite model was a Level 0 type, or in some rare cases a Level 1 type.

4.2.2 Satellite models: quantified results

The students submitted 43 satellite model files on the four courses. Forty of these were created with Freemind and three with other applications. Figure 12 summarizes the results of analyzing the students' satellite models. The bar chart shows the four courses (*EfW BIT*, *EfW IT*, *EfW TOUR*, and *GLOBAL*) and how many satellite models on each course were Level 3, Level 2, Level 1, or Level 0.

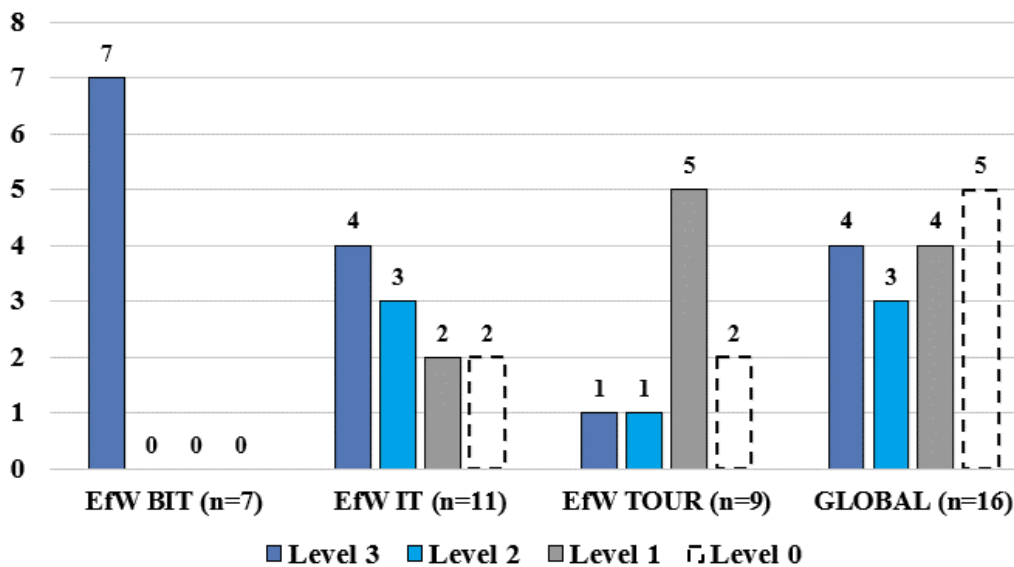


Figure 12. Quality of the satellite models created on the four ESP courses (n=43)

All satellite models submitted on the *EfW BIT* course were Level 3, showing thorough to extensive use of terminological methods. They included four or more various concept relation types (e.g. type, part, origin, and time relations) and used symbols to designate superordinate concepts, subordinate concepts, and steps of a process (or other temporal relations). The results varied more on the other three courses. Of the 11 *EfW IT* satellite models, four were Level 3, three were Level 2, and two were Level 1. That is, a total of nine of the 11 *EfW IT* satellite models showed anything from some to extensive use of terminological methods. The remaining two were Level 0 and showed very little use of terminological methods or could not be classified. Of the nine *EfW TOUR* satellite models, only one was a Level 3 type and one was a Level 2 type. Five *EfW TOUR* satellite models were Level 1 and two were Level 0. Finally, 11 of the 16 *GLOBAL* satellite models showed anything from some to extensive use of terminological methods; the

remaining five were Level 0 and showed very little use of terminological methods or could not be classified. I should note that, even if concept relations were identified, they were not always correct, or some nodes did not include concepts (e.g. *Meet sports personalities*).

To help generalize, Figure 13 presents the overall quality of the students' satellite models on all four courses by adding Level 3 results to level 2 results and Level 1 results to Level 0 results. The results are in percentages.

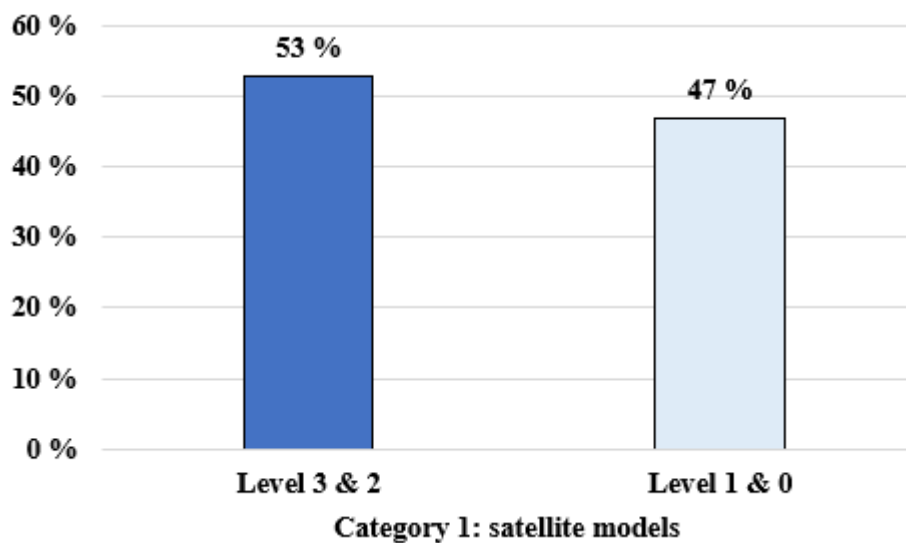


Figure 13. Overall quality of the satellite models (n=43)

As the bar chart shows, many to most of the students' satellite models showed extensive (Level 3) or at least some to thorough use (Level 2) of terminological methods. That is, a little over half (53%) of the created satellite models were either of the Level 3 or Level 2 type. This is encouraging but not conclusive. Since nearly half of the satellite models were of the Level 1 or Level 0 type, this indicates that more attention should be directed in helping students to create better (i.e. Level 3 and Level 2) satellite models. From the perspective of this study, this means that the satellite models should include at least four various types of concept relations and, for example, use symbols that designate superordinate and subordinate concepts. To present a qualitative perspective, the next section examines examples of my students' satellite models. They represent each evaluative level (3–0) and are from each of the four courses.

4.2.3 Satellite models: qualitative results

I chose the case examples presented here because they are some of the most representative and obvious kinds of their particular evaluative level. I mainly discuss the examples based on the characteristics I presented earlier in chapter 4.2.1. The characteristics are the following two: *Characteristic 1: number of various concept relations*; *Characteristic 2: use of suggested symbols (or similar)*.

Image 16 is a screenshot of a part of a Level 3 satellite model submitted on the *EfW BIT* course. This satellite model analyzed an audio streaming service called Deezer but had *Media streaming services* as its central concept, which divided into two main types: *Audio streaming services* and *Video streaming services*.

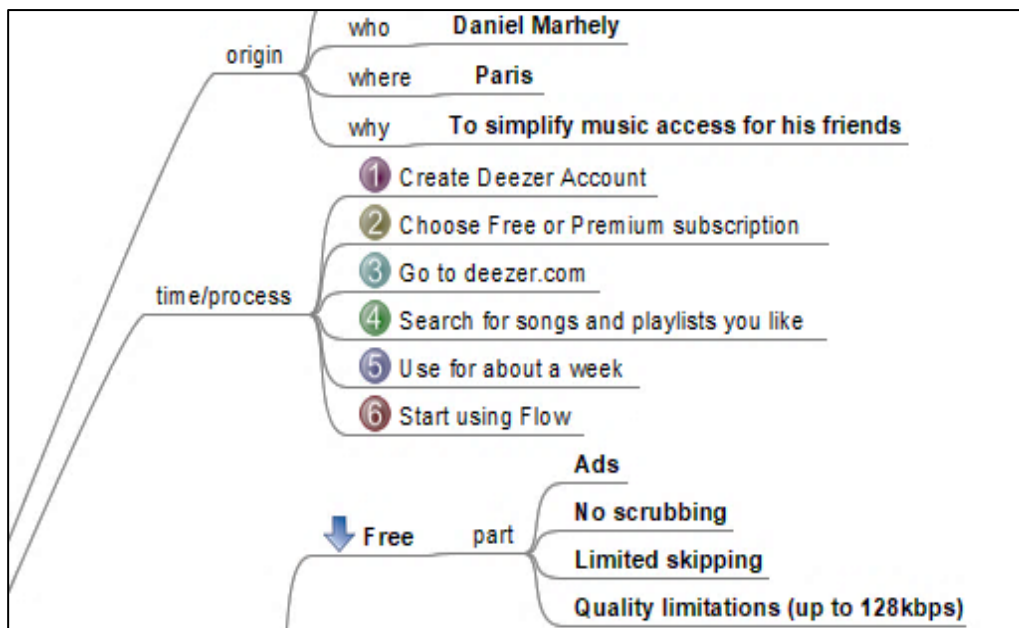


Image 16. Screenshot of a Level 3 type satellite model

Although the screenshot in Image 13 shows only a part of the concept system presented in the satellite model, already the shown part has the required four various types of concept relations: origin, process, type, and part relations. It also includes symbols that show the different steps of a process and symbols that designate subordinate concepts. It

should be noted, though, that the parts are not all concepts *per se*. Despite this, this satellite model showed thorough to extensive use of terminological methods.

Image 17 is a screenshot showing a part of a Level 2 satellite model created on the *EfW IT* course. The topic was *Avast antivirus*, but the satellite model had a generic concept as a central concept: *antivirus software*. In addition to Avast, the satellite model had nodes, for example, for other antivirus software (McAfee, Norton, and F-Secure) and a node for types of malware (e.g. *adware*, *backdoor virus*, and *spyware*).

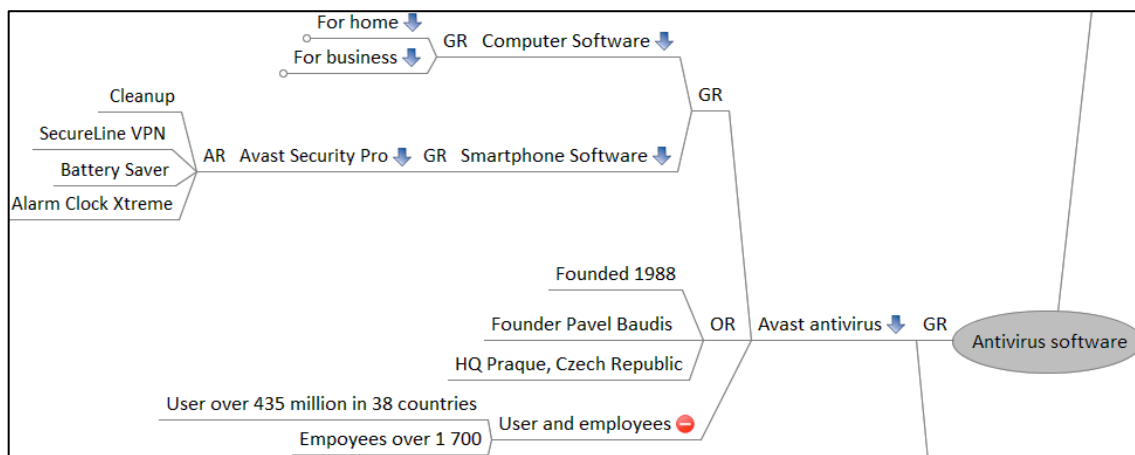


Image 17. Screenshot of a Level 2 type satellite model

The part of the satellite model shown in Image 17 includes three types of concept relations: a generic (i.e. type) relation node, an origin relation node, and an accessory relation node. The satellite model also includes the symbol to designate subordinate concepts and the symbol that indicates that one of the nodes has additional information the students wanted to include: the number of Avast users and employees.

Some concepts in the Avast antivirus satellite model were individual concepts (e.g. antivirus software companies such as Norton and McAfee), which does not necessarily help in learning professional concepts in English. (This does, though, still provide students with professional knowledge, e.g. knowledge about the different companies.) Moreover, some of the concepts (e.g. *Computer software*; *Smartphone software*) in the satellite model were somewhat misplaced. Despite some shortcomings, the Avast antivirus satellite model showed some to thorough use of terminological methods.

Image 18 is an example of a Level 1 satellite model and was created on the *EfW TOUR* course. The topic examined in the satellite model is *sports tourism*, which is also the central concept.



Image 18. Screenshot of a Level 1 type satellite model

The part of the satellite model shown here includes generic (i.e. type) and origin relations and the suggested symbol to designate subordinate concepts. In addition to the agent, the origin relation nodes could include nodes such as the place of origin, the time of origin, and the purpose of the described concept (Nuopponen 2018: 462–462). Moreover, some nodes do not include actual concepts (e.g. *Meet sports personalities*).

Finally, Image 19 is a screenshot of a part of a *GLOBAL* course Level 0 type satellite model assignment product that reminded a mind map rather than a satellite model.



Image 19. Screenshot of a Level 0 type satellite model

Since this assignment product did not identify any concept relations, it failed to visualize an actual concept system. I, therefore, classified this as being a Level 0 satellite model and showing very little use of terminological methods or cannot be classified.

To summarize, while many of them were good and according to the given instructions, the students' satellite models included some recurring shortcomings. The *EfW BIT* and *EfW IT* satellite models were created based on examining IT products or services. These

are individual concepts, which are not usually examined in terminology work, although some students had realized that it is better to have a generic concept as a central concept (e.g. *antivirus software*). Other shortcomings I noticed are the following: concepts that are not actual concepts; no concept relation nodes; misplaced concept nodes; no symbols to identify, for example, superordinate and subordinate concepts; and only one or two concept relation types used.

4.3 Evaluative analysis of the students' concept definitions

This chapter presents the results of analyzing my students' concept definition documents. Chapter 4.3.1 first introduces the characteristics I used to assess the assignment products in the analysis process. Chapter 4.3.2 then presents quantified results and chapter 4.3.3 presents qualitative results by discussing some case examples.

4.3.1 Characteristics to assign evaluative levels to concept definition documents

Table 8 shows the characteristics to assign the evaluative levels (3–0) to the students' concept definition documents. An *EfW* concept definition document that observed the writing instructions well and included ten or more concepts was a Level 3 type concept definition document and so on. The assignment had more weight on the *GLOBAL* course: a *GLOBAL* concept definition document that observed the writing instructions well and identified 14 or more concepts was a Level 3 type document and so on.

Table 8. Characteristics to assign evaluative levels to concept definition documents

<i>EfW IT, BIT & TOUR</i>	Level 3	Level 2	Level 1
Characteristic 1: writing instructions observed	Well	Moderately	A little
Characteristic 2: number of concepts	≥ 10	8–9	≤ 7
<i>GLOBAL</i>	Level 3	Level 2	Level 1
Characteristic 1: writing instructions observed	Well	Moderately	A little
Characteristic 2: number of concepts	≥ 14	11–13	≤ 10

Regarding Characteristic 1, the concept definitions in a specific document had to be according to the instructions and examples. They had to define concepts based on superordinate concepts and have defining characteristics; the definitions had to be concise but show the writers' English skills; all definitions also had to have a similar structure. A document in which most definitions followed the instructions was assessed to be a Level 3 document, a document in which some to many definitions followed the instructions was assessed to be a Level 2 document, and a document in which few to some definitions followed the instructions was assessed to be a Level 1 document. In case of discrepancy, Characteristic 1 had more weight. However, both characteristics had to be present for a concept definition document to be a Level 3 type document. For example, if a concept definition document included over 10 definitions (=Level 3), or showed otherwise good work, but the writing instructions had not been followed, the document was a Level 2 document. Finally, if most of the defined concepts were not concepts, or if the definitions were poor or incorrect, the document was a Level 0 document, in some cases Level 1.

4.3.2 Concept definitions: quantified results

The students submitted altogether 40 concept definition documents. The documents included anything from two to over 20 definitions. The number of the submitted documents is three less than the number of the submitted satellite models: some students or student teams submitted a satellite model but not a concept definition document.

All seven *EfW BIT* concept definition documents showed use of terminological methods; there were no Level 0 documents. Of the 11 *EfW IT* concept definition documents, nine showed use of terminological methods; only two of the 11 *EfW IT* concept definition documents were Level 0 and showed very little use of terminological methods or could not be classified. In contrast, of the eight *EfW TOUR* concept definition documents, four were Level 0 and showed very little use of terminological methods or could not be classified. The other four were either Level 3 or Level 1, and there were no Level 2 type *EfW TOUR* concept definition documents. All 14 *GLOBAL* concept definition documents showed use of terminological methods, and there were no Level 0 type documents. Figure

14 presents the result of analyzing the concept definition documents. The bar chart shows the four courses (*EfW BIT*, *EfW IT*, *EfW TOUR*, and *GLOBAL*) and how many concept definition documents on each course was Level 3, Level 2, Level 1, and Level 0.

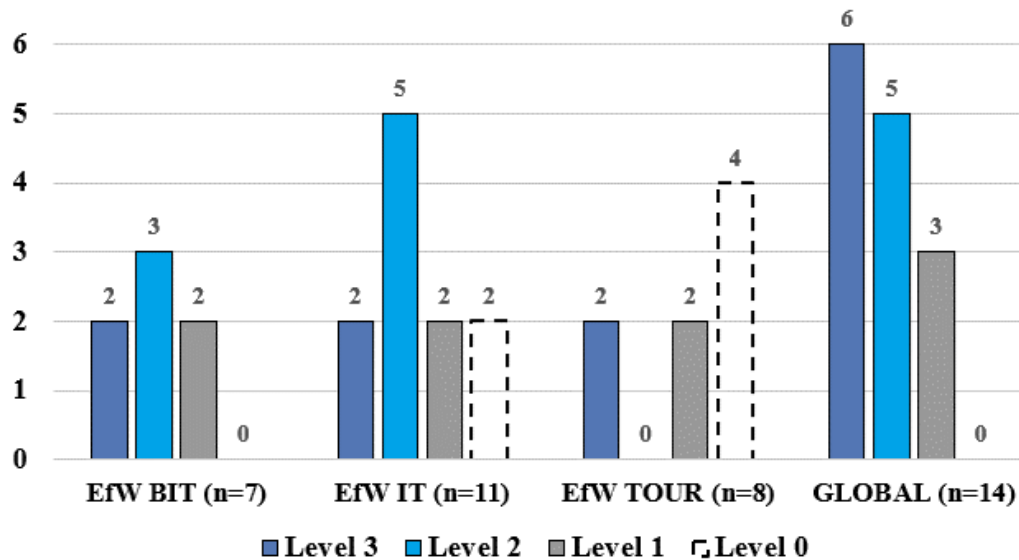


Figure 14. Quality of the concept definitions on the four ESP courses (n=40)

To help generalize, Figure 15 presents the overall quality of the students' concept definition documents on the four courses by adding Level 3 results to Level 2 results and Level 1 results to Level 0 results. The results are in percentages.

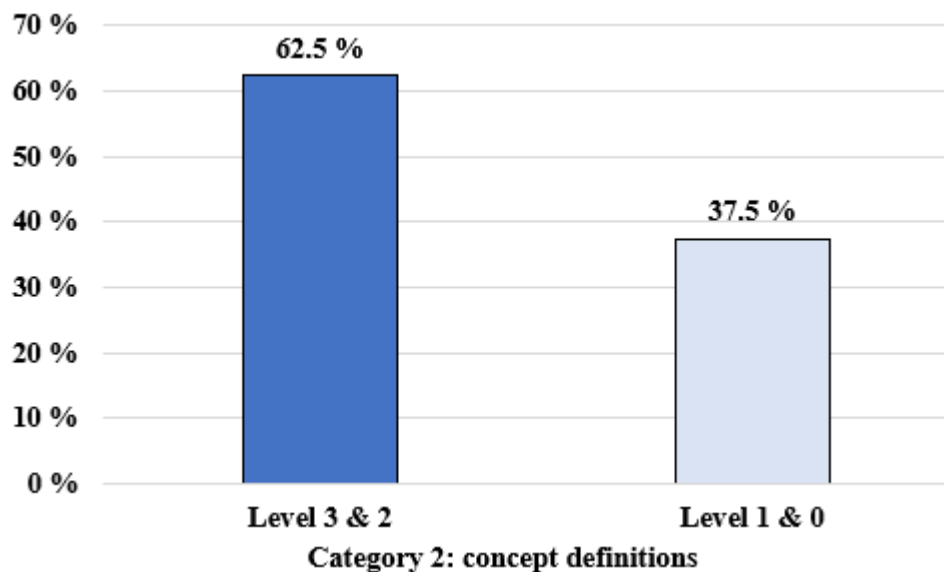


Figure 15. Overall quality of the concept definition documents

As Figure 15 shows, nearly two thirds (62.5%) of the students' concept definition documents showed thorough to extensive (Level 3) or some to thorough use (Level 2) of terminological methods. Considering the aim of the study, the results are encouraging and imply that university-level ESP language students can write relatively good concept definitions in English. To provide a qualitative perspective, the next section presents examples of my students' concept definitions. The examples represent each evaluative level and are from each of the four courses.

4.3.3 Concept definitions: qualitative results

As with the satellite models, I chose the case concept definition examples presented here because they represent their particular evaluative levels well. I mainly examine the examples here based on the characteristics I presented in chapter 4.3.1. The characteristics are the following: *Characteristic 1: writing instructions observed*; *Characteristic 2: number of concepts*.

Image 20 is a screenshot taken of a Level 3 concept definition document. The concept definitions were created based on the earlier-presented Deezer satellite model. The complete document included 24 concept definitions, mostly focusing on generic concepts.

Web client is a *client* that runs on a remote *web server* to provide access to data on the same or a different *server*.

Media streaming is a process of continuous media data transfer between a *server* and multiple *clients* that is usually described by a strict specification and utilizes an existing communication protocol.

Streaming service is an Information technology entity that consists of a data provider, technological implementation and users, which all perform *media streaming*.

Audio streaming service is a *streaming service* that distributes audio data (e.g. music, podcasts, radio) to its users.

Video streaming service is a *streaming service* that distributes video data (e.g. videoclips or real-time CCTV surveillance) to its users.

Service subscription is a status of a user being able or unable to use a *streaming service*; it is usually acquired by a regular payment of a predefined sum.

Image 20. Screenshot of a Level 3 type concept definition document

All definitions in this document were concise, and each definition shown in the screenshot attempts to define the concept based on a superordinate concept: Web client... *a client*; Media streaming... *a process*; Streaming service... *an information technology entity*; Audio streaming service... *a streaming service*; Video streaming service... *a streaming service*; Service subscription... *a status of a user*. In the definitions shown in the screenshot, the defining characteristics are in most cases given in a relative clause as was suggested in my instructions. Despite some grammatical problems, the Deezer concept definition document was classified as being a Level 3 type document and showing thorough to extensive use of terminological methods.

Regarding Level 2 concept definition documents, interestingly, the one submitted together with the earlier-shown Level 0 satellite model was classified as a Level 2 document. The visualization was a mind map rather than a proper satellite model, but mind maps are useful in gathering information. The document included 17 definitions, all defining generic concepts. Image 21 is a screenshot showing a part of the document.

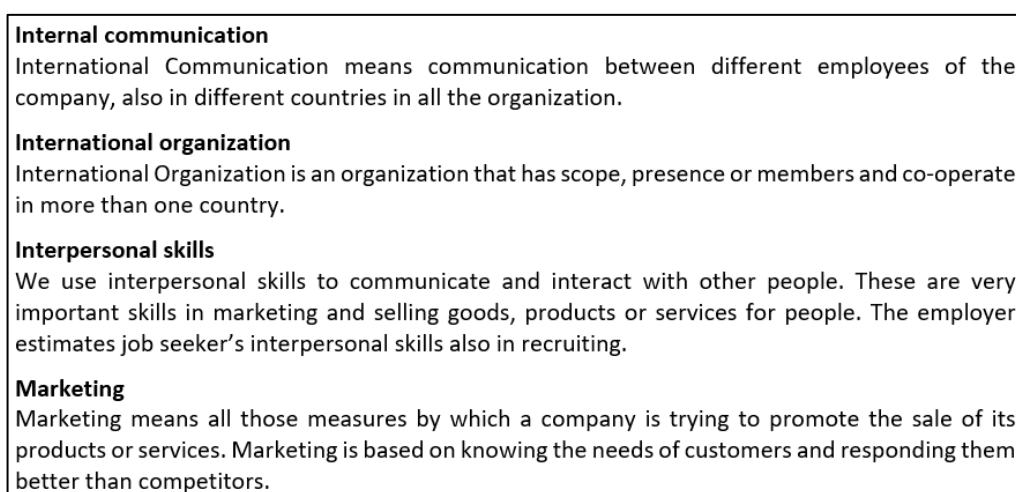


Image 21. Screenshot of a Level 2 type concept definition document

The definitions are concise. Three of the four concepts in the screenshot show attempt to define the concepts based on superordinate concepts: International communication... *communication*; International organization... *an organization*; Marketing... *(those) measures*. The definition of *Interpersonal skills* does not follow the pattern. In addition, the verb *to mean* in two of the definitions should be replaced with the verb *to be*. Despite

this and some grammatical problems, this concept definition document was classified as being a Level 2 type and showing some to thorough use of terminological methods.

The next example, Image 22, is a screenshot showing a part of another Level 2 concept definition document submitted on the *GLOBAL* course. This document included 16 concept definitions of which most defined generic concepts.

Global marketing company – is a company that provides such services as promotion and advertisement of products and services of some other company/companies.

Global mass communication – sending messages to a large number of people all over the world. For example, television and the Internet are mass media.

Global political communication – flows of information, mostly political messages, that are globally exchanged between politicians, parties, media, and citizens in order to inform and/or persuade the latter.

Image 22. Screenshot of a Level 2 type concept definition document

As in the two previous examples, the definitions shown in the screenshot here are concise. The first concept definition defines the concept based on a superordinate concept as instructed: Global marketing company... *a company*. The definition also includes a relative clause to present defining characteristics. The other two definitions do not follow the pattern, and it is unclear what the superordinate concept might be in each case. Each definition does, however, identify characteristics. In short, this document was classified as being of Level 2 and showing some to thorough use of terminological methods.

Image 23 is a screenshot showing a part of a Level 1 concept definition document submitted on the *EfW TOUR* course. This document included 11 concept definitions, all defining generic concepts.

Product knowledge
Product knowledge means knowing the product or service you are selling. Good product knowledge means also having additional information and being able to answer any kinds of questions coming from possible customers.

Marketing
Marketing means promoting your service or product to increase your sales.

Recruiting
Recruiting is the process of seeking and selecting new employees to hire. Efficient recruiting aims to hiring the most qualified persons.

Image 23. Screenshot of a Level 1 type concept definition document

The definitions in the screenshot are concise as instructed and grammatically quite accurate. However, only the third one clearly defines the concept based on a superordinate concept (Recruiting... *the process of*). Moreover, none of the definitions present the defining characteristics in a relative clause, although each definition does include defining characteristics. Overall, the document was classified as being of Level 1 and showing some use of terminological methods.

Finally, Image 24 is a screenshot taken of a Level 0 concept definition document created on the *EfW IT* course. This concept definition document included only the two concept definitions shown in the screenshot although the basic requirement was to list and define at least ten concepts.

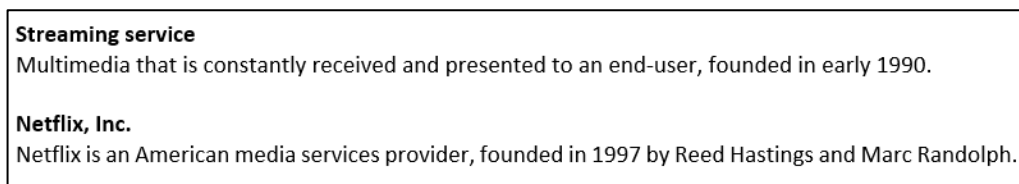


Image 24. Screenshot of a Level 0 type concept definition document

The definitions are concise as instructed. The first one defines a generic concept, the second an individual concept. Both concepts are defined based on a superordinate concept (Streaming service... *multimedia*... Netflix, Inc... *an American media service provider*) and include some defining characteristics. However, having only two concept definitions, this concept definition document was classified as being of Level 0 and showing very little use of terminological methods.

Overall, the students' concept definition documents showed use of terminological methods, but they included some recurring shortcomings. Most documents included at least some grammatical problems or careless mistakes; defined concepts were not defined based on superordinate concepts; there was no proper linking (e.g. a linking verb *to be*) between concepts and superordinate concepts; defining characteristics were not given clearly in a relative clause; a document did not include the required number of concept definitions; and finally, the definitions listed in a specific document were not always well-formed or written consistently.

5 STUDENTS' VIEWS ON TERMINOLOGICAL METHODS

This chapter examines my students' views on my teaching materials, systematic concept analysis, and the satellite model. To find out their views, I administered an online questionnaire. While providing data, the questionnaire also allowed the respondents to reflect on their learning. I made the questionnaire by using the E-lomake tool created by a company called Eduix Oy. The tool was made available by the University of Vaasa.

5.1 Questionnaire to collect students' answers

I had the questionnaire available both in Finnish and in English (Appendix 1 & 2) and made it available at the end of each course during a reflection and feedback session. The questionnaire included nine statements answered on a five-point Likert-type response set from 5 (strongly agree) to 1 (strongly disagree). The questionnaire was set up so that all nine statements had to be answered. Table 9 lists the statements.

Table 9. Questionnaire statements

Statements to find out the students' views on terminological methods
1. The basic idea of concept analysis and the satellite model was easy to understand.
2. The concept analysis and satellite model lecture materials were easy to understand.
3. The concept analysis and satellite model assignment instructions were easy to understand.
4. I needed the teacher to give me further help with the concept analysis and satellite model assignment.
5. Concept analysis and the satellite model helped me get an overall idea of my topic (e.g. an IT product, a company...)
6. Concept analysis and the satellite model supported and deepened my learning overall.
7. Concept analysis and the satellite model helped me learn professional concepts/vocabulary in English.
8. Concept analysis and the satellite model helped me understand my major/specialization (e.g. IT, business...) in English.
9. I might use concept analysis and the satellite model to learn professional concepts/about professional topics.

To examine the internal consistency, reliability, of the questionnaire items, I calculated Cronbach's alpha using a spreadsheet, Reliability Calculator, created and made available

by Siegle (2013). I downloaded the raw data as spreadsheets from the E-Iomake tool and copied the data to Siegle's (2013) spreadsheet. Based on this, Cronbach's alpha for the questionnaire items is 0.96. A score close to 1 indicates internal consistency; however, a score over 0.9 also indicates a risk of redundancy and suggests that some items should likely be removed (Trobia 2008: 169; also e.g. Tavakol & Dennick 2011).

The sample in this study is based on convenience sampling and from a section of the population that was readily available: the students on the four courses. Out of the 118 students, 95 answered the questionnaire, giving a response rate of 81%. In the autumn of 2018, the Faculty of Business and Hospitality Management at Lahti UAS had 1140 undergraduate students (Lahti UAS 2019), making the 95 respondents to equal 8.3% of the population. To get more representative and generalizable results, collecting a wider, more randomized sample would be recommended (see Waterfield 2018: 402–403.)

5.2 Respondents' background information

As presented in Table 10, of the 95 respondents, forty-six (48%) had completed high school and 32 (34%) had completed vocational school. The rest had completed both or had other educational backgrounds. Most respondents were either information technology (33%) or hospitality management students (37%).

Table 10. Respondents' educational background and specialization (n=95)

Course Background	EfW BIT n=5	EfW IT n=31	EfW TOUR n=35	GLOBAL n=24	Total n=95
Education					
High school	4 (80%)	14 (45%)	19 (54%)	9 (37%)	46 (48%)
Vocational school	1 (20%)	12 (39%)	10 (29%)	9 (37%)	32 (34%)
Both		2 (7%)	5 (14%)	5 (21%)	12 (13%)
Other		3 (9%)	1 (3%)	1 (4%)	5 (5%)
Specialization					
Business		3 (10%)		5 (21%)	8 (8%)
Business logistics				13 (54%)	13 (14%)
Hospitality management			35 (100%)		35 (37%)
Information technology	3 (60%)	28 (90%)			31 (33%)
International business				5 (21%)	5 (5%)
Other	2 (40%)			1 (4%)	3 (3%)

Since *English for Work* is a first-year ESP language course, and the data was collected on three *English for Work* courses and on one *Global Communication in Business* course, most respondents were first-year students and had 40 credits or less. Moreover, regarding the respondents' age range, 62 (65%) were in the age range 17–24, and the rest mainly in the age ranges 25–34 and 35–44. This is shown in Table 11.

Table 11. Respondents' year of study and other information (n=95)

Course	EfW BIT n=5	EfW IT n=31	EfW TOUR n=35	GLOBAL n=24	Total n=95
Background					
Year of study					
1st year	5 (100%)	29 (93%)	35 (100%)	1 (4%)	70 (74%)
2nd year		2 (7%)		16 (67%)	18 (19%)
3rd year				5 (21%)	5 (5%)
4th year				2 (8%)	2 (2%)
5th year of higher					
Earned credits					
0–40	5 (100%)	29 (93%)	35 (100%)	1 (4%)	70 (74%)
41–80		2 (7%)		12 (50%)	14 (15%)
81–120				6 (25%)	6 (6%)
121–160				5 (21%)	2 (5%)
Age range					
17–24	4 (80%)	19 (61%)	29 (83%)	10 (42%)	62 (65%)
25–34	1 (20%)	8 (26%)	4 (11%)	6 (25%)	19 (20%)
35–44		4 (13%)	1 (3%)	5 (20%)	10 (11%)
45–			1 (3%)	3 (13%)	4 (4%)

It was also important to ask about the respondents' English skills because I had created all teaching materials in English. Finding out the respondents' nationality (those who responded in English) helps in finding out how many foreign students participated in the study. This is shown in Table 12.

Table 12. Respondents' English skills and nationalities (n=95)

Course	EfW BIT n=5	EfW IT n=31	EfW TOUR n=35	GLOBAL n=24	Total n=95
Background					
English skills					
Level 4	3 (60%)	4 (13%)	7 (20%)	7 (29%)	21 (22%)
Level 3		20 (65%)	12 (34%)	6 (25%)	38 (40%)
Level 2	2 (40%)	5 (16%)	10 (29%)	8 (33%)	25 (26%)
Level 1		2 (7%)	6 (17%)	3 (13%)	11 (12%)
Nationality					
Chinese				2 (8%)	2%
Finnish*				2 (8%)	2%
Russian	2 (40%)			1 (4%)	3%
Other	3 (60%)			1 (4%)	4%

*Two Finnish speakers answered the questionnaire in English.

Regarding English skills, 38 respondents (40%) reported being at Level 3 (*I speak and write well. I understand almost everything*) and 21 (22%) at Level 4 (*I speak and write very well. I understand almost everything with ease*). The remaining 36 (38%) reported being at Level 2 or Level 1. Finally, there were five foreign students who answered the questionnaire in English on the *EfW BIT* and the *GLOBAL* course.

5.3 Attitude analysis to examine the respondents' views

To examine the respondents' answers, I applied *attitude analysis* (cf. Jelovčić 2010). This simply draws on the notion that a Likert-type response format, such as the one used in the questionnaire I created, is possibly the most widely used method to measure attitude and opinion, especially in educational and social sciences (see e.g. Brill 2008: 427 and Barnette 2010: 714).

I grouped the data by dividing the statements and the related data into two groups: *Group 1: views on the topic and the teaching materials: statements 1–4*; *Group 2: views on the two terminological methods: statements 5–9*. I calculated frequency counts and percentages of each type of response (5–1) for each statement and collected the results into tables and bar charts. The tables show how many and what percentage of the respondents on each course chose what scale point (5–1) for each statement. The bar charts compare the overall results. Figure 16 illustrates the phases of the analysis process.

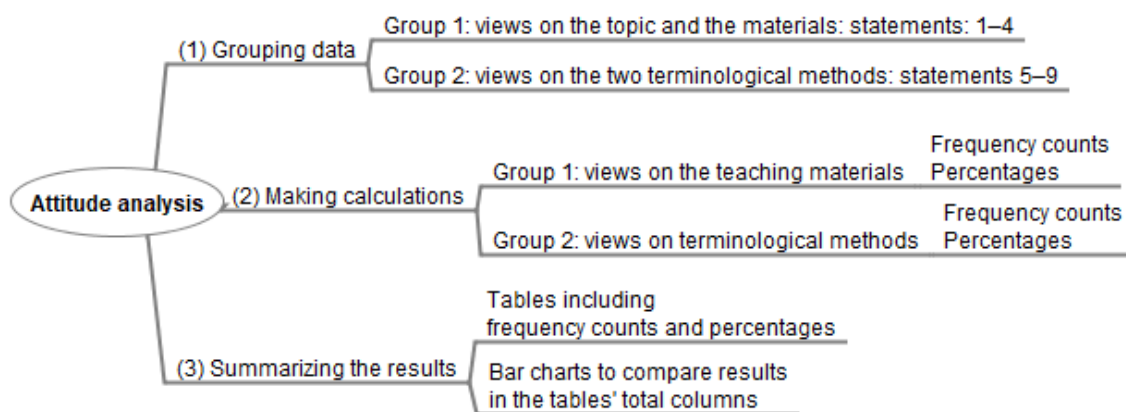


Figure 16. Phases of attitude analysis

If the respondents mostly agree or strongly agree with the statements, this can be interpreted to show that they considered benefiting from learning to use the methods. This, furthermore, implies that it can be recommended that ESP language teachers try integrating terminological methods into their teaching, at least in English for General Purposes language courses in higher-education contexts with undergraduate students.

5.3.1 Results and discussion: views on the teaching materials

The discussion here focuses on some of the consistencies in the results regarding the Group 1 statements (i.e. statements 1–4), and I interpret the results mostly in connection with the respondents' English skills. All results are presented in tables: Table 13 collects the results for statements 1, 2, and 3; Table 14 collects the results for statement 4. The discussed consistencies are highlighted in the tables. Finally, to summarize, Figure 17 at the end compares the overall results based on the total columns in the tables.

The results for statements 1, 2, and 3 are explored together. Statement 1 concerned the need to understand the basic idea of concept analysis and the satellite model, statement 2 the need to understand the lecture materials, and statement 3 the need to understand the assignment instructions: *S1: The basic idea of concept analysis and the satellite model was easy to understand; S2: The concept analysis and satellite model lecture materials were easy to understand; S3: The concept analysis and satellite model assignment instructions were easy to understand.* Being different, statement 4 is discussed separately. Statement 4 concerned the need to ask for further help from the teacher: *S4: I needed the teacher to give me further help with the concept analysis and satellite model assignment.*

The results showed some consistency between the answers to statement 1, statement 2, and statement 3. All five *EfW BIT* respondents either agreed or strongly agreed, and therefore saw that the overall idea, the lecture materials, and the course assignment instructions were easy to understand. The *EfW IT* respondents' answers showed more variety, but the results still revealed consistency. Of the 31 *EfW IT* respondents, a total of 21 (67%) either strongly agreed or agreed with the first two statements, and therefore

agreed that the overall idea and the lecture materials were easy to understand. Regarding statement 3, a total 16 (52%) of the *EfW IT* respondents either agreed or strongly agreed with the statement. To generalize, most respondents studying IT agreed that the topic, the lecture materials, and the course assignment instructions were easy to understand. Notably, the participating IT and BIT students' English skills were relatively good. Three (60%) *EfW BIT* respondents reported being at Level 4 (*I speak and write very well. I understand almost everything with ease*), and *EfW BIT* students are studying in a bachelor's degree program organized in English. Of the *EfW IT* respondents, a total of 19 (78%) reported being at Level 4 or level 3 (*I speak and write well. I understand almost everything*). Having good English skills helped in understanding the overall idea and the materials.

Compared to the *EfW IT* and *BIT* respondents, the *EfW TOUR* respondents' answers to statement 1, 2, and 3 revealed different results. On average, a total of two fifths (40%) of the 35 *EfW TOUR* respondents either strongly disagreed or disagreed with all three statements (S1: 15/42%; S2: 14/40%; S3: 13/37%). To generalize, the *EfW TOUR* respondents therefore disagreed that the overall idea and the materials were easy to understand. (Regarding statement 2, another two fifths (40%) of the *EfW TOUR* respondents also agreed with the statement). No one strongly agreed with any of the first three statements. On the *EfW TOUR* course, the students' English skills differed but a total of 16 out of the 35 respondents reported being at Level 2 (10/29%) (*I speak and write quite well. I understand most things with ease*) or only at Level 1 (6/17%) (*I speak and write with some difficulty. I understand most things*). Not having high-enough English skills likely caused problems in some cases in understanding the basic idea of using the methods and in understanding the teaching materials.

In the 24 *GLOBAL* respondents' answers, there is no clear consistency between the results for statement 1, statement 2, and statement 3. In total, 13 (54%) of the *GLOBAL* respondents either disagreed or strongly disagreed with statement 1 and therefore disagreed that the overall idea was easy to understand. In contrast, regarding statement 2, 10 (41%) of the *GLOBAL* respondents agreed or strongly agreed that the lecture materials were easy to understand. Finally, regarding statement 3 and the ease of understanding the

assignment instructions, the results were inconclusive: a total of 9 (37%) agreed or strongly agreed, but likewise, a total 9 (37%) disagreed or strongly disagreed with the statement. The *GLOBAL* respondents reported their English skills as follows: Level 4, 7/29%; Level 3, 6/25%; Level 2, 8/33%; and Level 1, 3/13%. Since a total of 13 (54%) of the *GLOBAL* respondents reported having Level 4 and 3 English skills and a total of 11 (46%) having Level 2 or Level 1 skills, this may explain the results for statement 3 (understanding the course assignment instructions) and the difference compared to the results for statement 2 (understanding the lecture materials). The assignment instructions are detailed and long, and therefore likely more difficult to understand than the lecture materials, especially to those who reported having Level 2 or Level 1 English skills.

Table 13. Statement 1, 2, and 3: understanding the topic and teaching materials

S1: The basic idea of concept analysis and the satellite model was easy to understand					
Course	EfW BIT n=5	EfW IT n=31	EfW TOUR n=35	GLOBAL n=24	Total n=95
5. Strongly agree	2 (40%)	2 (6%)	0 (0%)	4 (17%)	8 (8%)
4. Agree	3 (60%)	19 (61%)	10 (29%)	3 (12%)	35 (37%)
3. Neither agree/disagree	0 (0%)	7 (23%)	10 (29%)	4 (17%)	21 (22%)
2. Disagree	0 (0%)	3 (10%)	11 (31%)	9 (37%)	23 (24%)
1. Strongly disagree	0 (0%)	0 (0%)	4 (11%)	4 (17%)	8 (8%)
S2: The concept analysis and satellite model lecture materials were easy to understand					
Course	EfW BIT n=5	EfW IT n=31	EfW TOUR n=35	GLOBAL n=24	Total n=95
5. Strongly agree	3 (60%)	2 (6%)	0 (0%)	1 (4%)	6 (6%)
4. Agree	2 (40%)	19 (61%)	14 (40%)	9 (37%)	44 (46%)
3. Neither agree/disagree	0 (0%)	8 (26%)	7 (20%)	8 (33%)	23 (24%)
2. Disagree	0 (0%)	2 (6%)	12 (34%)	5 (21%)	19 (20%)
1. Strongly disagree	0 (0%)	0 (0%)	2 (6%)	1 (4%)	3 (3%)
S3: The concept analysis and satellite model assignment instructions were easy to understand					
Course	EfW BIT n=5	EfW IT n=31	EfW TOUR n=35	GLOBAL n=24	Total n=95
5. Strongly agree	3 (60%)	3 (10%)	0 (0%)	1 (4%)	7 (7%)
4. Agree	2 (40%)	13 (42%)	9 (26%)	8 (33%)	32 (34%)
3. Neither agree/disagree	0 (0%)	7 (23%)	13 (37%)	6 (25%)	26 (27%)
2. Disagree	0 (0%)	7 (23%)	9 (26%)	8 (33%)	24 (25%)
1. Strongly disagree	0 (0%)	1 (3%)	4 (11%)	1 (4%)	6 (6%)

Overall, of all 95 respondents, a total of 43 (45%) either agreed or strongly agreed with statement 1 (*S1: The basic idea of concept analysis and the satellite model was easy to understand*). Regarding statement 2 (*S2: The concept analysis and satellite model lecture materials were easy to understand*) a total of 50 (52%) of the respondents either agreed or strongly agreed. Finally, a total of 39 (41%) of the respondents either agreed or strongly agreed with statement 3 (*S3: The concept analysis and satellite model assignment instructions were easy to understand*).

Regarding statement 4 and the need to get more help from the teacher with the assignment, the results showed some consistency. In total, over half of the *EfW IT*, *EfW TOUR*, and *GLOBAL* respondents agreed or strongly agreed with the statement (17/55%; 18/52%; 14/59%). Of the five *EfW BIT* respondents, three (60%) disagreed or strongly disagreed, meaning that they did not need further help from the teacher. In addition to the differences in the respondents' English skills, one explanation for this might be group size. On the *EfW BIT* course, the group size was considerably small: there were only 10 active students. On the other three courses, the group size was much larger, varying between 30 to nearly 40 students. Because of the small group size, the *EfW BIT* students had much more contact with me during the workshop sessions than the students on the other three courses. Therefore, on the other three other courses, the students likely felt that they needed more individual instruction and help with the assignment.

Table 14. Statement 4: needing further help from the teacher

S4: I needed the teacher to give me further help with the concept analysis and satellite model assignment					
Course	EfW BIT n=5	EfW IT n=31	EfW TOUR n=35	GLOBAL n=24	Total n=95
5. Strongly agree	0 (0%)	5 (16%)	1 (3%)	4 (17%)	10 (11%)
4. Agree	1 (20%)	12 (39%)	17 (49%)	10 (42%)	40 (42%)
3. Neither agree/disagree	1 (20%)	5 (16%)	8 (23%)	4 (17%)	18 (19%)
2. Disagree	2 (40%)	7 (23%)	7 (20%)	4 (17%)	20 (21%)
1. Strongly disagree	1 (20%)	2 (6%)	2 (6%)	2 (8%)	7 (7%)

To help summarize the discussion and focus on the key results for Group 1 statements (1–4), Figure 17 combines the results for point 5 (Strongly agree) with point 4 (Agree) and the results for point 1 (Strongly disagree) with point 2 (Agree) in the total columns

in the tables. The figure also presents the average of the totals for statements 1, 2, and 3. To focus, the results for the middle option (3 Neither agree nor disagree) have been left out. The chart presents the results in percentages.

As Figure 17 shows, on average, nearly half (46%) of the respondents agreed or strongly agreed that concept analysis, the satellite model, and the teaching materials were easy to understand. Statement 4 is separate from this as it related to the need to get further help from the teacher with the assignment (*S4: I needed the teacher to give me further help with the concept analysis and satellite model assignment*). Over half (53%) of the respondents either strongly agreed or agreed that further support from the teacher was needed to work on the assignment. In addition, on average, a little less than one third (29%) strongly disagreed or disagreed with statements 1, 2, and 3, meaning that there is some need to develop the teaching materials further.

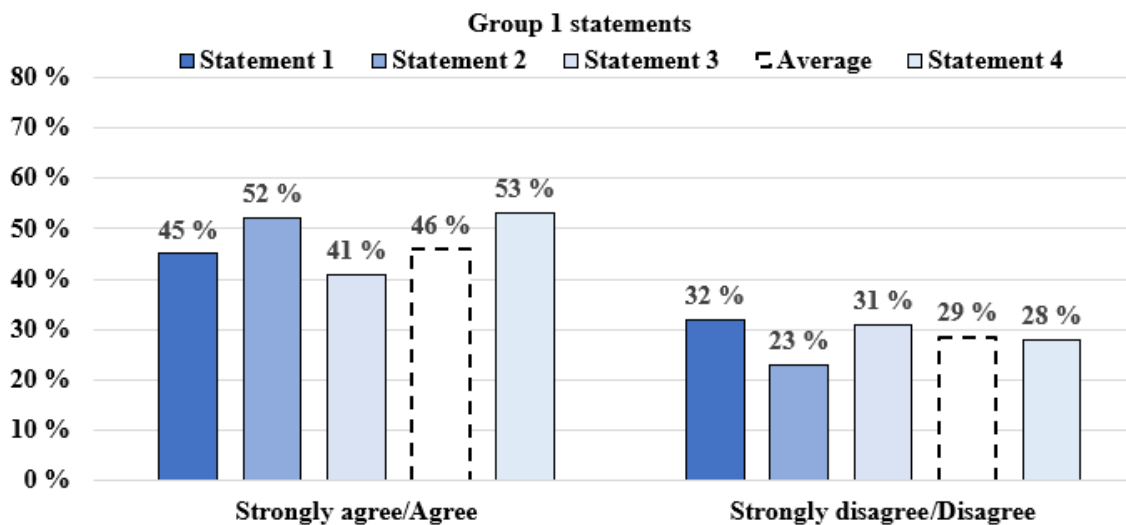


Figure 17. Comparing the overall results of Group 1 statements

To summarize, while the results are promising and imply that many respondents agree on having understood the overall idea of systematic concept analysis and the satellite model and consider the teaching materials easy to understand, the results are not fully conclusive. In addition, the respondents reported needing further help from the teacher with the course assignment. This needs to be noted when the course assignment and the overall assignment process is developed further.

5.3.2 Results and discussion: views on terminological methods

This chapter discusses some of the consistencies in the results for the Group 2 statements (i.e. statements 5–9). Statement 5 and 6, as well as 7 and 8, are explored together. Statement 5 and 6 concerned the use of systematic concept analysis to learn about the studied topic and learning in general: *S5: concept analysis and the satellite model helped me get an overall idea of my topic; S6: concept analysis and the satellite model supported and deepened my learning*. Statement 7 and 8 concerned learning English: *S7: Concept analysis and the satellite model helped me learn professional concepts/vocabulary in English; S8: Concept analysis and the satellite model helped me understand my major/specialization in English*. The results for statement 9 are discussed separately. Statement 9 concerned using systematic concept analysis and the satellite model in the future: *S9: I might use concept analysis and the satellite model to learn professional concepts/about professional topics*. Table 15 collects the results for statement 5 and 6, Table 16 for statement 7 and 8, and Table 17 for statement 9. The found consistencies are highlighted in the tables. At the end of the section, Figure 18 compares the overall results based on the total columns in the tables.

The results show some consistency between the answers to statements 5 and 6. Four (80%) out of the five *EfW BIT* respondents either agreed or strongly agreed with both statements, and therefore agreed that the methods helped in getting an overall idea of the examined topics and that the methods helped and supported learning. Thirteen (42%) of the *EfW IT* respondents agreed with both statements. In contrast, of the 35 *EfW TOUR* respondents, a total of 16 (45%) disagreed or strongly disagree with statement 5 and 15 (42%) with statement 6. These *EfW TOUR* respondents therefore considered that the methods did not help in getting an overall idea of the examined topic and that the methods did not support their learning. Finally, the *GLOBAL* respondents' answers varied more between statements 5 and 6. In total, 12 (50%) of the *GLOBAL* respondents either agreed or strongly agreed that the methods had helped in getting an idea of the studied topic. Regarding statement 6, only 8 (34%) agreed or strongly agreed, whereas 10 (42%) neither agreed nor disagree with the statement.

Both the *EfW BIT* and the *EfW IT* students could freely choose the topic they wanted to examine. The instructions simply stated it should be an IT product or service. This may explain why the respondents on both courses mostly agreed with statement 5 (the methods helped in getting an overall idea of the topic) and 6 (the methods supported and deepened my learning). Focusing on well-known products or services, which are individual concepts, (e.g. Netflix, Spotify, Twitter, etc.) likely makes it easier to do systematic concept analysis and create satellite models. However, individual concepts are not commonly analyzed in terminology work.

The *EfW TOUR* students were required to examine tourism and hospitality management topics suggested by a subject teacher. These were all somewhat abstract generic concepts (e.g. *adventure tourism, bleisure tourism, shopping tourism, destination marketing, etc.*), which may partly explain why many *EfW TOUR* respondents disagreed with statement 5 (the methods helped in getting an overall idea of the topic) and statement 6 (the methods supported and deepened my learning). Being first-year students, the *EfW TOUR* students likely considered the topics difficult to examine, let alone in English and with unfamiliar methods such as systematic concept analysis and the satellite model.

As with the *EfW TOUR* course, on the *GLOBAL* course, the students were not allowed to freely choose their topics but had to examine a generic concept based on a required course reading: *global corporate communication*. In contrast to all *EfW* respondents, most *GLOBAL* respondents were second-year students (16/57%) or third-year students (5/21%) and likely already had a strong basis in studying professional topics. This may explain why many of them agreed or strongly agreed with statement 5 (the methods helped in getting an overall idea of the topic). In addition, having a specific text to start from likely helped in the process.

On the other hand, as was noted, 10 (42%) of the *GLOBAL* respondents neither agreed nor disagreed with statement 6 (the methods supported and deepened my learning). Being mostly second- and third-year students, the *GLOBAL* students had likely already established particular learning strategies and, as a result, perhaps felt uncertain about the discussed terminological methods as learning tools. Moreover, the students' age, and

related experience, also likely explains some of this. In terms of age, the *GLOBAL* group of students was more heterogeneous than the other three groups, but a total 11 (52%) of the *GLOBAL* respondents were in the three older age ranges (age range 25–34: 6/25%; age range 35–44: 5/20%; age range 45–, 3/13%).

Table 15. Statement 5 and 6: understanding the topic and teaching materials

S5: Concept analysis and the satellite model helped me get an overall idea of my topic (e.g. an IT product, a company...)					
Course	EfW BIT n=5	EfW IT n=31	EfW TOUR n=35	GLOBAL n=24	Total n=95
Answer scale					
5. Strongly agree	1 (20%)	5 (16%)	2 (6%)	3 (13%)	11 (12%)
4. Agree	3 (60%)	13 (42%)	11 (31%)	9 (37%)	36 (38%)
3. Neither agree/disagree	1 (20%)	10 (32%)	6 (17%)	7 (29%)	24 (25%)
2. Disagree	0 (0%)	3 (10%)	12 (34%)	4 (17%)	19 (20%)
1. Strongly disagree	0 (0%)	0 (0%)	4 (11%)	1 (4%)	5 (5%)
S6: Concept analysis and the satellite model supported and deepened my learning overall					
Course	EfW BIT n=5	EfW IT n=31	EfW TOUR n=35	GLOBAL n=24	Total n=95
Answer scale					
5. Strongly agree	0 (0%)	0 (0%)	1 (3%)	5 (21%)	6 (6%)
4. Agree	4 (80%)	13 (42%)	12 (34%)	3 (13%)	32 (34%)
3. Neither agree/disagree	1 (20%)	12 (39%)	7 (20%)	10 (42%)	30 (32%)
2. Disagree	0 (0%)	5 (16%)	11 (31%)	5 (21%)	21 (22%)
1. Strongly disagree	0 (0%)	1 (3%)	4 (11%)	1 (4%)	6 (6%)

The analysis revealed certain consistencies in the respondents' answers to statements 7 and 8 between the four courses. As Table 16 on the following page shows, although the percentages between the courses differ, most *EfW IT*, *EfW TOUR*, and *GLOBAL* respondents agreed or strongly agreed with statement 7 (the methods helped me learn professional concepts in English) and statement 8 (the methods helped me understand my major in English). The few *EfW BIT* respondents, on the other hand, either mostly agreed or neither agreed nor disagreed with the statement.

Overall, of all 95 respondents, a total of 59 (63%) either agreed or strongly agreed with statement 7 and a total 45 (47%) either agreed or strongly agreed with statement 8. These results are somewhat promising from the perspective of ESP language teaching and the aim of this study. The results imply that the participating students considered the methods useful in learning professional concepts in English.

Table 16. Statement 7 and 8: terminological methods and English

S7: Concept analysis and the satellite model helped me learn professional concepts/vocabulary in English					
Course	EfW BIT n=5	EfW IT n=31	EfW TOUR n=35	GLOBAL n=24	Total n=95
Answer scale					
5. Strongly agree	0 (0%)	3 (10%)	2 (6%)	5 (21%)	10 (11%)
4. Agree	2 (40%)	21 (68%)	15 (43%)	11 (46%)	49 (52%)
3. Neither agree/disagree	2 (40%)	5 (16%)	8 (23%)	6 (25%)	21 (22%)
2. Disagree	1 (20%)	1 (3%)	7 (20%)	1 (4%)	10 (11%)
1. Strongly disagree	0 (0%)	1 (3%)	3 (9%)	1 (4%)	5 (5%)
S8: Concept analysis and the satellite model helped me understand my major/specialization (e.g. IT, business...) in English					
Course	EfW BIT n=5	EfW IT n=31	EfW TOUR n=35	GLOBAL n=24	Total n=95
Answer scale					
5. Strongly agree	0 (0%)	3 (10%)	1 (3%)	4 (17%)	8 (8%)
4. Agree	3 (60%)	12 (39%)	15 (43%)	7 (29%)	37 (39%)
3. Neither agree/disagree	2 (40%)	11 (35%)	7 (20%)	9 (38%)	29 (31%)
2. Disagree	0 (0%)	4 (13%)	11 (31%)	3 (13%)	18 (19%)
1. Strongly disagree	0 (0%)	1 (3%)	1 (3%)	1 (4%)	3 (3%)

Statement 9 focused on finding out the students' views on using the two methods later: *S9: I might use concept analysis and the satellite model to learn professional concepts/about professional topics.* The results showed some consistency as Table 17 reveals. Three (60%) *EfW BIT* respondents agreed with the statement, and a total of 16 (52%) of the *EfW IT* respondents agreed or strongly agreed. In contrast, 15 (43%) *EfW TOUR* and 11 (46%) *GLOBAL* respondents either disagreed or strongly disagreed with the statement.

Table 17. Statement 9: using terminological methods later

S9: I might use concept analysis and the satellite model to learn professional concepts/about professional topics					
Course	EfW BIT n=5	EfW IT n=31	EfW TOUR n=35	GLOBAL n=24	Total n=95
Answer scale					
5. Strongly agree	0 (0%)	3 (10%)	1 (3%)	4 (17%)	8 (8%)
4. Agree	3 (60%)	13 (42%)	7 (20%)	5 (21%)	28 (30%)
3. Neither agree/disagree	2 (40%)	5 (16%)	12 (34%)	4 (17%)	23 (24%)
2. Disagree	0 (0%)	4 (13%)	9 (26%)	6 (25%)	19 (20%)
1. Strongly disagree	0 (0%)	6 (19%)	6 (17%)	5 (21%)	17 (18%)

To help conclude the discussion and present clearer results, Figure 18 presents the overall results regarding Group 2 statements (5–9) by combining the results for point 5 (Strongly agree) with point 4 (Agree) and the results for point 1 (Strongly disagree) with point 2 (Agree) in the total columns in the tables. The results for the middle option (3 Neither agree nor disagree) have been left out. The figure presents the average for statements 5 and 6 as well as 7 and 8. Statement 9 is presented separately.

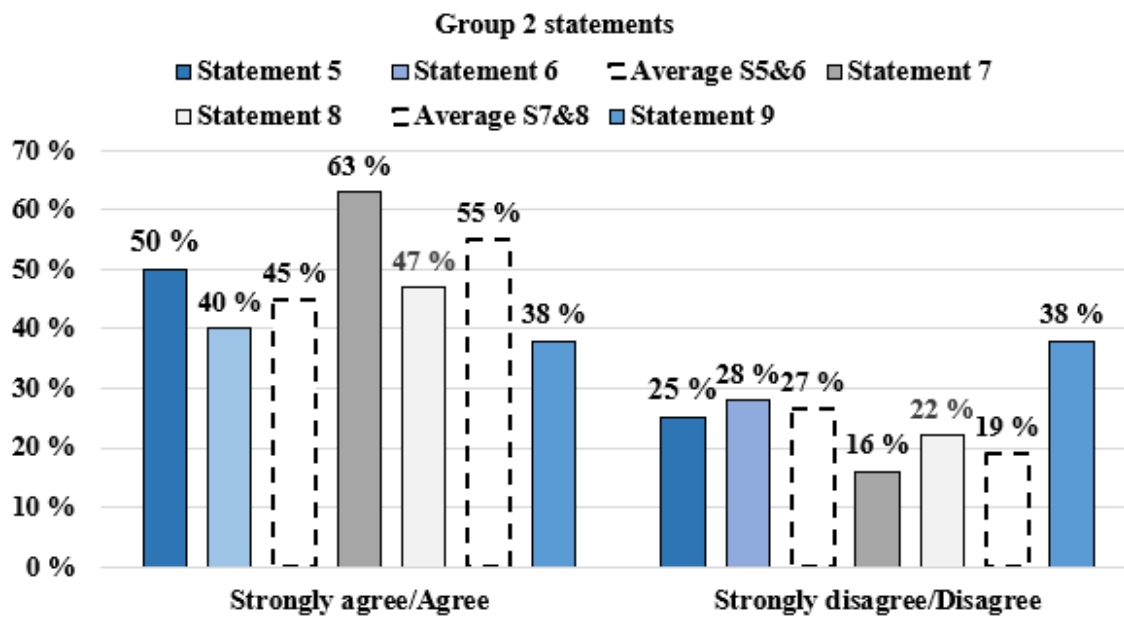


Figure 18. Comparing the overall results of Group 2 statements

On average, nearly half (45%) of all respondents agreed or strongly agreed that the methods helped in getting an idea of the topic and supported learning. On average, over half (55%) of all respondents agreed or strongly agreed that the two methods helped in learning professional concepts in English and in understanding their major in English. Regarding statement 9, on average, about two fifths (38%) of all respondents agreed or strongly agreed that they might use the methods to learn professional concepts. Notably, however, another two fifths (38%) also disagreed or strongly disagreed with this.

To summarize, based on the results, it seems that many of the respondents on the four courses considered concept analysis and the satellite model as useful tools. However, the results are not fully conclusive and indicate that further motivating is needed to ensure

that ESP language learners would fully understand the benefits terminological methods may offer for future business and other professionals.

5.4 Some open-ended comments

In addition to the nine statements answered on a scale of 5–1, the questionnaire included an answer box for open-ended comments. Out of the 95 responses in the questionnaire, only 12 included comments. Out of these 12, nine included something relevant regarding the research topic of this study. The remaining three comments were simply general course feedback. The bullet points listed below include the nine comments divided into positive and critical feedback:

Positive feedback:

- **EfW BIT:** It was easy to grasp the concept and relatively easy to work the functions of freemind.
- **EfW TOUR:** The assignment [...] was nice. [Translated from Finnish]
- **GLOBAL:** I think that the satellite model is fundamental at the beginning of any process that regards brainstorming and writing. I think that it is very helpful and I will use it in the future, especially when I will write my thesis [...]
- **GLOBAL:** It was great that we were properly introduced to the satellite model during the course and given a tool (Freemind) that could be used to get the most out of it! I do believe I will be utilizing the model in the future as well especially with my studies.

Critical feedback (translated from Finnish):

- **EfW TOUR:** [...] the assignment instructions were difficult to understand.
- **EfW TOUR:** [...] the satellite model was a difficult task, and I didn't fully understand it.
- **EfW IT:** I didn't like Freemind. It's too confusing to use and often didn't do what I would've wanted it to do.
- **EfW IT:** The concept model felt more useful than the satellite model. I felt that it just made everything more confusing.
- **EfW IT:** Understanding the satellite model was difficult. It was difficult to get the concepts right, even if edited some of these during the course. I think applying a simpler mind map type version would've been better.

The comments divide nearly equally into positive and critical ones. As these few comments reveal, some respondents noted that understanding how to use the satellite

model was difficult and confusing. On the other hand, some respondents noted that they are likely to use the satellite model in the future, for example, for study purposes. Likewise, whereas some respondents noted that Freemind was difficult to use, others said that it was a useful tool. Especially the critical feedback should be taken into consideration if the course assignment is used in the future.

6 INTEGRATING TERMINOLOGICAL METHODS INTO ESP TEACHING

I want to briefly reflect on the process of integrating terminological methods into university-level ESP language teaching. More specifically, I want to present some ideas on how to develop the course assignment process further from a teacher's perspective. To do this, I draw on some of the results and findings presented in chapters 4 and 5.

Based on how I organized the course assignment process in the action research project, an ESP teacher has five key tasks. The teacher 1) gives a lecture to explain what concepts are and summarizes some key concept relation types (e.g. generic, partitive, origination, process, transmission, and activity); the teacher 2) explains the course assignment (that includes the key steps of systematic concept analysis); the teacher instructs 3) and 4) helps learners in creating course assignment products (satellite models and concept definitions); and finally, 5) the teacher classifies students' course assignment products. Figure 19 presents the process.

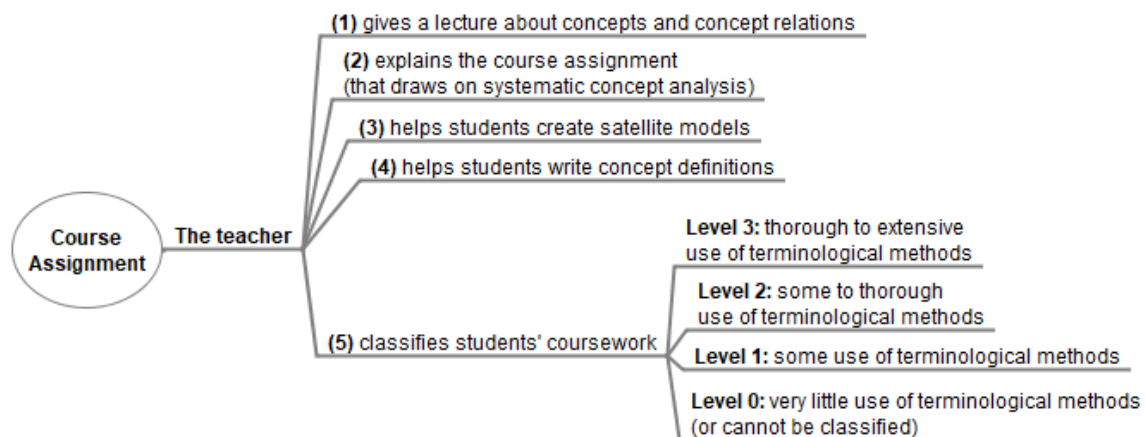


Figure 19. Course process for the ESP language teacher: version 1

Since I lectured in English, all my teaching materials were in English (only some key terms given in Finnish). Based on the information given in the questionnaire, the decision to use English seems to be supported by the respondents' self-assessment of their English skills: most respondents reported that they can speak and write well or very well and understand almost everything. In addition, many agreed on having understood the overall

idea of systematic concept analysis and the satellite model and considered the teaching materials easy to understand.

However, the results were not fully conclusive since some respondents also disagreed. This indicates that there is a need to reconsider how to improve the process and introduce the idea and some need to develop the teaching materials further. In addition, regarding doing the course assignment, many respondents agreed that they needed further help with the assignment. Although there were very few open-ended comments, some mentioned that the assignment was hard to understand. Based on these findings, the materials, especially the course assignment instructions, need to be simplified. The course assignment process could be updated so that it includes several workshop sessions that help in solving certain problems in the assignment process. Organizing several workshop sessions also allows having more time to instruct individual learners, which helps learners to better understand the idea and also helps them in creating better assignment products.

Based on the results of evaluating the submitted coursework, focusing on somewhat familiar professional concepts may produce better-quality satellite models, especially with first-year students. The teacher should consider instructing learners to specifically work on identifying and defining general concepts; terminology work commonly focuses on general concepts. However, examining individual concepts can be useful for ESP language learners since this, too, can provide them with professional knowledge in English. For example, business students analyzing a specific company and its products and services (i.e. individual concepts), gain knowledge about the company, its business operations, its competitors, the overall business environment in English.

To help create better satellite models, the organized workshop sessions could be designed to process in steps. Learners could, for example, start by first creating mind maps of their topics and then elaborate these and start identifying actual concepts, concept relations, and relation types to create fully-developed satellite models (see e.g. Nuopponen 2011: 6; 2018: 464–466). In addition, to help deepen learning and create more versatile satellite models, the teacher should make sure that the satellite models include several different concept relation types (e.g. generic relations, origination relations, temporal relations,

partitive relations, and activity relations). The teacher should also instruct learners to make sure that the finalized satellite models identify and designate superordinate, subordinate, and coordinate concepts.

In general, creating satellite models can be more difficult for novices than creating mind maps. Whereas mind maps are organic and associative, satellite models are more formal in that they need to include concept relation nodes to designate concept relations (see e.g. Nuopponen 2016: 196–199). Identifying concept relation types can be demanding, but this is a key part of the process and should not be overlooked. On the other hand, since satellite models are not as associative and free in form as mind maps, they can be useful for sharing knowledge. This is important, and knowledge sharing should be included in the work process because by sharing satellite models and concept definitions with each other, learners can gain a more thorough understanding of the examined part of the professional field in English.

Regarding concept definitions, based on the results of evaluating the submitted coursework, most students managed to produce good concept definitions in English based on very little instruction. However, since about a third of the submitted concept definition documents did not show at least some thorough use of terminological methods (Level 2), there is some need to improve instruction. I noticed some shortcomings in nearly all submitted concept definition documents, such as minor grammatical mistakes, not defining concepts based on superordinate concepts, not defining many enough concepts, and not writing consistent and well-formed concept definitions. Consequently, to help write better concept definitions, the assignment process could also include at least one workshop session that specifically focuses on concept definition writing in English. This should be one of the final steps of the process. Finally, it is important to note here that concept definitions written in the context of ESP language teaching should ideally be grammatically complete sentences. While it is good to teach ESP language learners to write clear and concise concept definitions, to produce grammatically full sentences, they should not fully observe the instructions used and examples given for practical terminology work (see e.g. Suonuuti 2001: 19–30, annex; ISO 1087:2019: 3.3).

Figure 20 shows an improved, more detailed version of the course assignment process based on my reflections above. The process now includes several workshop sessions to help learners work on the assignment in steps and a knowledge-sharing session.

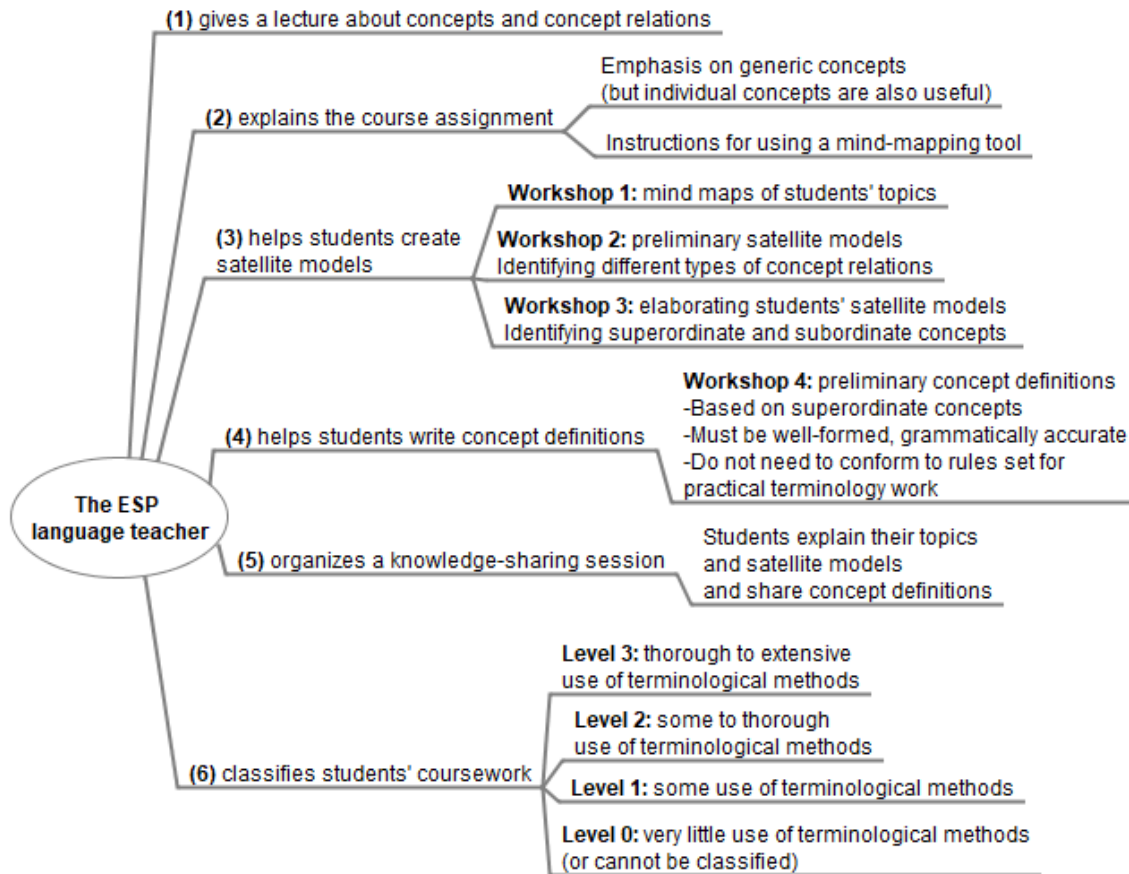


Figure 20. Course process for the ESP language teacher: version 2

Regarding the teacher's approximate workload, giving the lecture takes about an hour to an hour and a half. Likewise, explaining the course assignment and starting the process takes about an hour to an hour and a half. Although not listed in Figure 20, this should include some instructions for using a mind-mapping tool. Depending on group size, it is recommended to reserve two to three hours for each workshop session to let learners have enough time to work and to have time to give them individual instruction. The knowledge-sharing session should take about an hour to two to allow learners to carefully explain their work. Finally, the time spent on classifying and evaluating submitted coursework, of course, depends on group size and the number of submitted assignments. However,

seeing and discussing the assignment products in the workshop sessions and the knowledge-sharing session should help the teacher in classifying students' coursework.

7 CONCLUSIONS

This study had its background in a teacher-initiated action research project during which I introduced terminological methods in English for Specific Purposes (ESP) language courses at Lahti University of Applied Sciences (now LAB University of Applied Sciences), Finland, in the autumn semester of 2018. I carried out the project on four ESP language courses with altogether 118 students: *English for Work (Information Technology)*, *English for Work (Business Information Technology)*, *English for Work (Tourism and Hospitality Management)*, and *Global Communication in Business*.

To integrate terminological methods into the four courses, I created lecture materials and a course assignment requiring the students to use the methods in practice to investigate a professional topic in English. The terminological methods examined were systematic concept analysis and writing concept definitions as well as a tool, the satellite model, which can be used to visualize concept relations and concept systems. The course assignment includes the key steps of systematic concept analysis and the final result of the assignment was a professional presentation in English about the investigated topic.

The specific aim of this study was to develop ESP language teaching to better meet its aims by examining the integration of terminological methods into English for Specific Purposes (ESP) language courses. The study presented two research questions:

1. What kinds of satellite models and concept definitions can ESP language students produce in the assigned coursework to identify and define professional concepts in English?
2. What are the participating ESP language students' views on systematic concept analysis, the satellite model, and the related teaching materials and assignment?

To answer the research questions, I collected and analyzed two types of data: 1) the students' course assignment products, and 2) their views based on an online questionnaire.

On the four courses, the students submitted altogether 43 satellite models and 40 concept definition documents with an average of 10–15 concept definitions per document. To analyze the submitted work, the assignment products were first divided into two categories according to their type: *Category 1: quality of satellite models*; *Category 2: quality of concept definitions*. In each category, based on a set of predefined characteristics, the assignment products were assigned the following evaluative levels: *Level 3: thorough to extensive use of terminological methods*; *Level 2: some to thorough use of terminological methods*; *Level 1: some use of terminological methods*; *Level 0: very little use of terminological methods or cannot be classified*. The results indicated that most students managed to create satellite models and write concept definitions in English. In other words, most of the submitted assignment products showed at least some use of terminological methods.

Especially the created concept definitions were mostly good and according to the given instructions. From the perspective of ESP language teaching, it is encouraging that the ESP language learners in this study managed to write good concept definitions in English. However, the quality of the satellite models was not always as high. Since the satellite model is a useful and versatile tool for visualizing and examining professional concept systems, knowledge structures, if ESP language teachers decide to introduce it and create coursework that requires its use, it is recommended to put time and effort into introducing how satellite models are created.

Despite shortcomings, regarding the first research question, it can be concluded that, overall, university-level ESP language learners can successfully use terminological methods to identify and define concepts in English. More specifically, they can do small-scale systematic concept analysis, visualize concept relations and concept systems, and write concept definitions. This implies that developing ESP language teaching by integrating terminological methods into teaching practice can help ESP language teaching to better meet its aims to teach professional concepts and related background knowledge and to develop learners' competence in having control over the knowledge they may already have.

Regarding my students' views and the second research question, altogether 95 students out of the 118 enrolled students answered the questionnaire. The questionnaire was administered to find out respondents' views on the created teaching materials and, in general, on terminological methods. To analyze the answers, I divided the data into two groups: *Group 1: views on the topic and the teaching materials*; *Group 2: views on the two terminological methods*.

Based on the findings, it can be concluded that many of the respondents considered the teaching materials easy to understand (Group 1 answers) and systematic concept analysis and the satellite model as useful tools (Group 2 answers). However, it should also be noted that some respondents felt that they would have needed more help with the course assignment. The results also revealed that some may need further motivation to properly understand the benefits of using terminological methods.

It can be concluded that developing university-level ESP language teaching by integrating terminological methods into ESP language courses is possible and can produce good results although the process is not fully straightforward; teaching and instructing how to use terminological methods require careful planning and time and effort in the context of ESP language teaching. Nevertheless, it can be recommended that ESP language teachers would try integrating terminological methods into their teaching practice and coursework, at least in English for General Purposes language courses in higher-education contexts with undergraduate students. This benefits ESP language teaching and teachers. Rather than trying to acquire in-depth knowledge of various professional topics and trying to become a subject specialist alongside language and communication teaching, an ESP language teacher can instead become a specialist in teaching terminological methods that ESP language learners can use to examine professional concepts and related knowledge in English.

Regarding the research design of this study, it should be noted that evaluating and classifying the submitted coursework is somewhat subjective even if there are predefined evaluative levels with clear characteristics. In addition, while internally consistent, the questionnaire to find out students' views may have been partly redundant, which may

affect the results. Finally, the sample in this study was based on convenience sampling but having a wider and more randomized sample would be recommended.

Further research on integrating terminological methods into university-level ESP language teaching could take several directions. For example, to provide even clearer and more conclusive findings, a future research project could go on to repeat the research process described in this thesis and focus on collecting larger and more varied data sets and use more rigorous methods. Such a research project could, for example, introduce terminological methods on various ESP language courses and collect data on courses taught in different fields by different ESP language teachers and even at different higher-education institutions.

A future research project could focus on interviewing university-level ESP language teachers to collect their views about the overall idea of integrating terminological methods into ESP language teaching. This could provide a much more in-depth view of how to create lecture materials and course assignments that better suit university-level ESP language learners. Moreover, since ESP language teachers cannot be experts in every possible specialist field, or their terminologies and communicative practices, future research could aim to find out how ESP language teachers who teach in different fields of ESP might see the idea of teaching terminological methods to make students themselves much more responsible for systematically examining professional concepts and knowledge, and studying and defining these in English.

Finally, a comparative research project could be organized to find out which kinds of teaching materials and assignment instructions best suit specific ESP language learners. Such a research project could create different versions of the teaching materials, introduce these to different groups of ESP language learners, and collect data for comparison. Likewise, a comparative research project could focus on comparing learning results (esp. regarding professional terminology in English) between ESP language courses that introduce terminological methods and courses that use more traditional teaching methods.

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APPENDICES

Appendix 1. Student questionnaire FIN

The research permission was granted by the Lahti UAS Vice President for Education, Maarit Vilppunen, in August 2018.



Vaasan yliopisto

Käsitemanalyysi ja satelliittimalli ammattienglannin opetuksessa

Kyselyn tarkoituksena on kerätä aineistoa Vaasan yliopiston [markkinoinnin ja viestinnän yksikössä](#) työstämäni pro gradu -tutkielmaa varten. Tutkielman ohjaajana toimii [professori Anita Nuopponen](#). Tutkimusluvan on myöntänyt Lahden ammattikorkeakoulun vararehtori.

Samalla kun kysely tuottaa aineistoa tutkielmaani varten, se tarjoaa sinulle tilaisuuden pohtia oppimaasi. **Kyselyyn vastaaminen on anonyymia. Kyselyn tuottama aineisto käsitellään luottamuksellisesti ja tulee ainoastaan tutkimuskäyttöön.**

Lisätietoja:

[Hamid Guedra](#)
Englannin kielen ja viestinnän lehtori
Lahden ammattikorkeakoulu, liiketalouden ja matkailun ala

Osa 1: taustatiedot

Ole hyvä ja anna hieman taustatietoja itsestäsi.

★ 1. Koulutus

- Lukio/ylioppilas
- Ammatillinen koulutus
- Molemmat
- Muu

Muu koulutus

★ 2. Opiskeluala

- Liiketalous (päivä)
- Liiketalous ja logistiikka (monimuoto)
- Matkailuliiketoiminta
- Tietojenkäsittely
- Muu

Muu opiskeluala

★ 3. Opiskeluvuosi

- 1. vuosi
- 2. vuosi
- 3. vuosi
- 4. vuosi
- 5. vuosi tai enemmän

★ 4. Suoritetut opintopisteet

- 0–40
- 41–80
- 81–120
- 121–160
- 161–

★ 5. Ikä

- 17–24
- 25–34
- 35–44
- 45–

★ 6. Englannin osaaminen (itsearviointi)

- Puhun ja kirjoitan erittäin hyvin. Ymmärrän vaivatta lähes kaiken.
- Puhun ja kirjoitan hyvin. Ymmärrän lähes kaiken.
- Puhun ja kirjoitan melko hyvin. Ymmärrän vaivatta useimmat asiat.
- Puhe ja kirjoitus tuottavat vaikeuksia. Ymmärrän useimmat asiat.

Osa 2: väittämät

Ole hyvä ja ota kantaa alla oleviin väittämiin. Valitse omaa mielipidettäsi lähinnä oleva vaihtoehto.

1. Käsiteanalyysin ja satelliittimallin perusidea oli helppo ymmärtää.

	1. Täysin eri mieltä	2. Eri mieltä	3. Ei samaa/ei eri mieltä	4. Samaa mieltä	5. Täysin samaa mieltä	Kommentit
*Vastaus 1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="text"/>

2. Käsiteanalyysia ja satelliittimallia käsittelevä luentoaineisto oli helppo ymmärtää.

	1. Täysin eri mieltä	2. Eri mieltä	3. Ei samaa/ei eri mieltä	4. Samaa mieltä	5. Täysin samaa mieltä	Kommentit
*Vastaus 2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="text"/>

3. Käsiteanalyysia ja satelliittimallia soveltavan tehtävän ohjeet oli helppo ymmärtää.

	1. Täysin eri mieltä	2. Eri mieltä	3. Ei samaa/ei eri mieltä	4. Samaa mieltä	5. Täysin samaa mieltä	Kommentit
*Vastaus 3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="text"/>

4. Tarvitsin opettajalta lisäapua käsiteanalyysi- ja satelliittimallitehtävän tekemisessä.

	1. Täysin eri mieltä	2. Eri mieltä	3. Ei samaa/ei eri mieltä	4. Samaa mieltä	5. Täysin samaa mieltä	Kommentit
*Vastaus 4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="text"/>

5. Käsiteanalyysi ja satelliittimalli auttoivat saamaan kokonaiskuvan tehtävän aiheesta (esim. IT-tuote, yritys...)

	1. Täysin eri mieltä	2. Eri mieltä	3. Ei samaa/ei eri mieltä	4. Samaa mieltä	5. Täysin samaa mieltä	Kommentit
*Vastaus 5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="text"/>

6. Käsiteanalyysi ja satelliittimalli tukivat ja syvensivät oppimistani.

	1. Täysin eri mieltä	2. Eri mieltä	3. Ei samaa/ei eri mieltä	4. Samaa mieltä	5. Täysin samaa mieltä	Kommentit
*Vastaus 6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="text"/>

7. Käsiteanalyysi ja satelliittimalli auttoivat oppimaan ammattialan käsitteitä/sanastoa englanniksi.

	1. Täysin eri mieltä	2. Eri mieltä	3. Ei samaa/ei eri mieltä	4. Samaa mieltä	5. Täysin samaa mieltä	Kommentit
*Vastaus 7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="text"/>

8. Käsiteanalyysi ja satelliittimalli auttoivat ymmärtämään alaani (IT, liiketalous, matkailu...) englanniksi.

	1. Täysin eri mieltä	2. Eri mieltä	3. Ei samaa/ei eri mieltä	4. Samaa mieltä	5. Täysin samaa mieltä	Kommentit
*Vastaus 8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="text"/>


9. Saatan hyödyntää käsiteanalyysia ja satelliittimallia oppiakseni ammattikäsitteitä/ammattillisia teemoja.

	1. Täysin eri mieltä	2. Eri mieltä	3. Ei samaa/ei eri mieltä	4. Samaa mieltä	5. Täysin samaa mieltä	Kommentit
*Vastaus 9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="text"/>

10. Lisäkommentit:

Appendix 2. Student questionnaire ENG

The research permission was granted by the Lahti UAS Vice President for Education, Maarit Vilppunen, in August 2018.


University of Vaasa

Concept Analysis and the Satellite Model in Teaching English for Specific Purposes

This questionnaire collects data for a master's thesis project conducted in [the School of Marketing and Communication at the University of Vaasa](#). The master's thesis project is supervised by [Professor Anita Nuopponen](#). The research permit was granted by the Vice President of Lahti University of Applied Sciences.

While the questionnaire provides data for the master's thesis project, answering the questionnaire gives you an opportunity to reflect on your learning. **Answering the questionnaire is anonymous, and all data will be handled confidentially and used only for research purposes.**

For further information, please contact:

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Senior Lecturer in English and Communication Studies
Lahti University of Applied Sciences, Faculty of Business and Hospitality Management

Part 1: Background information

Please give some background information about yourself.

★ 1. Education

High school (or equivalent)
 Vocational school (or equivalent)
 Both
 Other

Other education

★ 2. Major/specialization

International business
 Information technology
 Other

Other major/specialization

★ 3. Year of study

1st year
 2nd year
 3rd year
 4th year
 5th year or higher

★ 4. Earned credits

0-40
 41-80
 81-120
 121-160
 161-

★ 5. Nationality

Chinese
 Finnish
 Russian
 Vietnamese
 Other

Other nationality

★ 6. Age range

17-24
 25-34
 35-44
 45-

★ 7. English skills (self-assessment)

I speak and write very well. I understand almost everything with ease. (e.g. IELTS 7.5)
 I speak and write well. I understand almost everything. (e.g. IELTS 6.5-7)
 I speak and write quite well. I understand most things with ease. (e.g. IELTS 6-6.5)
 I speak and write with some difficulty. I understand most things. (e.g. IELTS 5.5-6)

Part2: Statements

Please express your opinions concerning the below statements. Choose the option closest to your opinion.

1. The basic idea of concept analysis and the satellite model was easy to understand.

1. Strongly disagree 2. Disagree 3. Neither disagree/agree 4. Agree 5. Strongly agree Comments

* Answer 1

2. The concept analysis and satellite model lecture materials were easy to understand.

1. Strongly disagree 2. Disagree 3. Neither disagree/agree 4. Agree 5. Strongly agree Comments

* Answer 2

3. The concept analysis and satellite model assignment instructions were easy to understand.

1. Strongly disagree 2. Disagree 3. Neither disagree/agree 4. Agree 5. Strongly agree Comments

* Answer 3

4. I needed the teacher to give me further help with the concept analysis and satellite model assignment.

1. Strongly disagree 2. Disagree 3. Neither disagree/agree 4. Agree 5. Strongly agree Comments

* Answer 4

5. Concept analysis and the satellite model helped me get an overall idea of my topic (e.g. an IT product, a company...)

1. Strongly disagree 2. Disagree 3. Neither disagree/agree 4. Agree 5. Strongly agree Comments

* Answer 5

6. Concept analysis and the satellite model supported and deepened my learning overall.

1. Strongly disagree 2. Disagree 3. Neither disagree/agree 4. Agree 5. Strongly agree Comments

* Answer 6

7. Concept analysis and the satellite model helped me learn professional concepts/vocabulary in English.

1. Strongly disagree 2. Disagree 3. Neither disagree/agree 4. Agree 5. Strongly agree Comments

* Answer 7

8. Concept analysis and the satellite model helped me understand my major/specialization (e.g. IT, business...) in English.

1. Strongly disagree 2. Disagree 3. Neither disagree/agree 4. Agree 5. Strongly agree Comments

* Answer 8

9. I might use concept analysis and the satellite model to learn professional concepts/about professional topics.

1. Strongly disagree 2. Disagree 3. Neither disagree/agree 4. Agree 5. Strongly agree Comments

* Answer 9

10. Additional comments: