



universität
wien

DIPLOMARBEIT / DIPLOMA THESIS

Titel der Diplomarbeit / Title of the Diploma Thesis

„ESP lessons of horticultural English –

An analysis of vocabulary explanations in classroom talk
and of specialized vocabulary in teaching materials“

verfasst von / submitted by

Thomas Finker

angestrebter akademischer Grad / in partial fulfilment of the requirements for the degree of
Magister der Philosophie (Mag. phil.)

Wien, 2016 / Vienna, 2016

Studienkennzahl lt. Studienblatt /
degree programme code as it appears on
the student record sheet:

A 190 344 299

Studienrichtung lt. Studienblatt /
degree programme as it appears on
the student record sheet:

Lehramtsstudium UF Englisch
UF Psychologie und Philosophie

Betreut von / Supervisor:

Ao. Univ.-Prof. Mag. Dr. Ute Smit

ὅσων ὀψις ἀκοή μάθησις, ταῦτα ἐγὼ προτιμέω.

The things of which there can be sight, hearing,
and learning – these are what I especially prize.

Heraclitus of Ephesus

Acknowledgements

Over the course of the last years, I was privileged to spend considerable time as a scholar who, by definition, ‘lives at ease’. Thus, I was able to devote myself to *epistème* and *idéas*, resulting in acquiring *scientia* of philosophy and the English language. The thesis at hand is the result of this great enterprise, which could not have been undertaken singlehandedly. Hence, I wish to express my gratitude to several important persons.

First and foremost, my sincerest gratitude goes to my thesis adviser Ao.Univ.-Prof. Ute Smit. Her proficient guidance and invaluable expertise challenged and enriched my ideas, provided me with critical feedback, and directed my attention to the big pictures of both Linguistics and Applied Linguistics. Without her active interest in and professional commitment to my research topic, this thesis could not have been completed as successfully.

Furthermore, I would like to express my genuine appreciation to MMag. Dr. Elisabeth Weber, who showed great enthusiasm for my research right from the beginning and actively promoted my project in her classroom. This thesis would not have been possible without her remarkable willingness to record, observe, and analyze her lessons and teaching materials. Moreover, Elisabeth sparked my strong interest in both academia in general and English Language Teaching in particular. Thank you for setting the sails!

I want to thank all the students of the 3rd grade at the College for Horticulture and Landscape Design in Schönbrunn, Vienna, for their readiness for being accompanied by video equipment throughout eight horticultural English lessons.

Special thanks also go to the headmaster HR DI Gottfried Kellner, who gave me his full approval for conducting my research at his school.

Moreover, I am thoroughly grateful to both my brother Christian and my sister Karin for their moral support and encouragement throughout my studies as well as for their lifelong, wonderful companionship. Big thanks also go to my friends, who provide caring, entertainment, and true friendship.

Finally, I would like to thank my parents. For your unwavering support and endless love, I am truly grateful.

Declaration of authenticity

I confirm to have conceived and written this diploma thesis in English all by myself. Quotations from other authors and any ideas borrowed and/or passages paraphrased from the works of other authors are all clearly marked within the text and acknowledged in the bibliographical references.

Vienna, July 2016

Table of contents

List of abbreviations

List of figures

List of tables

1. Introduction	1
2. Specifying ESP.....	3
2.1. The development of ESP	3
2.2. Characteristics of ESP	6
2.3. Types of ESP	13
2.4. The ESP educationalist.....	20
2.5. ESP and language skills	26
3. Vocabulary teaching in the ESP classroom	30
3.1. What is vocabulary?	30
3.2. Knowing a word	33
3.3. Teaching strategies	37
3.4. Degrees of lexical technicality	40
3.4.1. Technical, semi-technical, and general vocabulary.....	41
3.4.2. Methods for classifying vocabulary	43
4. General description of the study	47
4.1. Research design.....	47
4.2. Description of the school.....	50
4.3. The school subject Englisch-Fachseminar (ENFS).....	51
4.4. Description of the participants	52
4.5. Data collection.....	53
4.6. Description of the recorded lessons.....	54
5. Research methodology	56
5.1. Analysis framework for teaching materials.....	56
5.2. Analysis procedure for classroom transcripts	60
6. Data analyses and results.....	64
6.1. Readability and vocabulary of ENFS teaching materials.....	64

6.1.1. Readability of “Worms at Work”	64
6.1.2. Readability of “Redwood Trees”	65
6.1.3. Readability of “Plants of the Sequoia National Park”	65
6.1.4. Readability of “Herbs”	66
6.1.5. Lexical technicality of “Worms at Work”	69
6.1.6. Lexical technicality of “Redwood Trees”	70
6.1.7. Lexical technicality of “Plants of the Sequoia National Park”	71
6.1.8. Lexical technicality of “Herbs”	72
6.2. Vocabulary explanations in ENFS lessons.....	75
6.2.1. Setting in focus (SIF)-sequences	77
6.2.2. Closing (CLO)-sequences	80
6.2.3. Analytic strategies	84
6.2.4. Animated strategies	90
7. Discussion	98
7.1. The use of reading texts in the ENFS classroom.....	98
7.2. The teaching of vocabulary in the ENFS classroom	100
7.3. Implications for ENFS-teaching.....	106
8. Conclusion	110
9. References	112

Appendices

Appendix 1	Survey among teachers of ENFS
Appendix 2	ENFS-teaching materials
Appendix 3	Transcription conventions
Appendix 4	Abstracts

List of abbreviations

AWL	Academic Word List
CCR	Classroom-centered Research
CEFR	Common European Framework of Reference for Languages
CIC	Classroom Interactional Competence
CLT	Communicative Language Teaching
EAP	English for Academic Purposes
EEP	English for Educational Purposes
EFL	English as a Foreign Language
EGP	English for General Purposes
ELF	English as a Lingua Franca
ELP	English for Legal Purposes
ELT	English Language Teaching
EMP	English for Medical Purposes
ENFS	Englisch-Fachseminar (‘Vocational English’)
EOP	English for Occupational Purposes
EPP	English for Professional Purposes
ESL	English as a Second Language
ESP	English for Specific Purposes
EST	English for Science and Technology
EVP	English for Vocational Purposes
FK	Flesch-Kincaid-Grade-Level
FRE	Flesch-Reading-Ease
HBLFA	Höhere Bundeslehr- und Forschungsanstalt (‘Agricultural College for Higher Vocational Education’)
HOME	Horticultural Material <i>for</i> English
IRF	Initiation-Response-Feedback
LSP	Language for Specific Purposes
L1	First Language
L2	Second Language
NGSL	New General Service List of English Words
VE	Vocabulary explanation
VESL	Vocational English as a Second Language

List of figures

Figure 1 Continuum of ELT course types (Dudley-Evans & St John 1998: 9)	11
Figure 2 Purposes of English (Jordan 1997: 3)	14
Figure 3 Areas of ESP teaching (Basturkmen 2010: 6)	14
Figure 4 The wide- and narrow-angled continuum (following Basturkmen 2010: 55)	18
Figure 5 What is involved in knowing a word (Nation 2001: 27)	34
Figure 6 Kinds of vocabulary knowledge and the most effective kinds of learning (Nation 2001: 35).....	36
Figure 7 The range of Reading Ease Scores (Flesch 1948: 230)	58
Figure 8 U.S. grade levels and their respective students' ages (Scott 2016)	59
Figure 9 Types of vocabulary explanations (Waring et al. 2013).....	61
Figure 10 Comparison of the FRE in teaching materials	67
Figure 11 Comparison of the FK score in teaching materials.....	68
Figure 12 Comparison of the degrees of off types in teaching materials	74
Figure 13 Correlation of FRE scores and the degrees of offlist words	75

List of tables

Table 1 The historical development of ESP research perspectives (Upton 2012: 14)	6
Table 2 Analysis of ESP teaching material (excerpt) with regard to NGSL (Browne, Culligan & Phillips 2013) and New AWL (Coxhead 2000)	43
Table 3 Analysis of ESP teaching material (excerpt) with regard to Chung & Nation's four-step scale (2004: 254)	44
Table 4 Analysis of ESP teaching material (excerpt) with regard to www.lex tutor.ca	45
Table 5 Readability of "Worms at Work"	64
Table 6 Readability of "Redwood Trees"	65
Table 7 Readability of "Plants of the Sequoia National Park"	65
Table 8 Readability of "Herbs"	66
Table 9 The FRE of each teaching material	66
Table 10 The FK score of each teaching material	67
Table 11 Analysis of "Worms at Work" with regard to www.lex tutor.ca	69
Table 12 Set of off types identified in "Worms at Work"	69
Table 13 Analysis of "Redwood Trees" with regard to www.lex tutor.ca	70
Table 14 Set of off types identified in "Redwood Trees"	70
Table 15 Analysis of "Plants of the Sequoia National Park" with regard to www.lex tutor.ca	71
Table 16 Set of off types identified in "Plants of the Sequoia National Park"	71
Table 17 Analysis of "Herbs" with regard to www.lex tutor.ca	72
Table 18 Set of off types identified in "Herbs"	72
Table 19 The degree of off types in each teaching material	73
Table 20 Number of instances per code	76
Table 21 Strategies, their implementation, and aims of vocabulary explanations	96

1. Introduction

English is not an end in itself; it is only a means to an end.

(O'Brien 1914: 475)

Language pursues manifold goals. This functional view of language is, amongst others, especially supported by Hymes' (1972: 56) ethnographic distinctions of "speech situations", "speech events", and "speech acts", with the latter being originally postulated by Austin (1975) and Searle (1969). As an example, the speech situation of a business meeting can include the speech event of a presentation, which in turn contains a certain directive at the end of the talk (the speech act). Both speech acts and events strongly rely, amongst others, on each interlocutor's knowledge of the necessary linguistic code (the "key" (Hymes 1974: 57)) and the genre or type of speech event as well as on the speaker's intentions. Hence, language use is closely bound to the context and the purpose of communication (Hymes 1989: 444).

The explicit goal-directedness of language use needs to be considered in English language teaching. In order to enable learners of English to use the language successfully according to their respective contexts and disciplines, the present as well as the future studies and professional backgrounds of these learners need to be taken into account. Analyzing the learners' particular needs with regard to English use in context and developing the subject-related, i.e. work- or study-connected, linguistic repertoire of the learners are the key tasks of English for specific purposes (ESP).

This thesis sets out to investigate the status quo of ESP within the wide field of English language teaching. Furthermore, particular emphasis is laid on the implementation of vocabulary teaching in ESP lessons since the preparation of ESP students to use English within their workplace or study environments primarily requires an integral vocabulary-teaching component (Xhaferi 2010: 236).

Given the fact that specialized English lessons (often referred to as 'Englisch-Fachseminar' (ENFS), 'Englisch Seminar', 'English for technical purposes', 'Englisch einschließlich Wirtschaftssprache') are central elements in the curricula of many Austrian vocational schools, ESP plays a crucial role in English language education in these parts. Therefore, an empirical study examining ESP teaching at the College for Horticulture and Landscape

Design in Vienna, Schönbrunn, was conducted, which links the theoretical status of ESP to present teaching practices.

In particular, Chapter 2 provides a brief historical outline of the developments of ESP research from the beginning up to the present day. Moreover, key characteristics and various categories of English for specific purposes are described before turning to the special teacher profile that is inevitable when it comes to planning and teaching ESP lessons. Here, the term ‘ESP educationalist’ is coined to illustrate the relevance of specified pedagogic expertise in specialized English lessons. Finally, ESP and its relations to the four language skills of speaking, listening, reading, and writing are discussed.

Having specified ESP, Chapter 3 examines the notions ‘vocabulary’ and ‘word knowledge’ to pave the way for a discussion of teaching strategies conveying ESP vocabulary. Furthermore, the thresholds between ESP vocabulary and other types of words will be illuminated. These analyses of lexical demarcation lines lead up to the presentation of three different methods for identifying lexical technicality in texts and thus in teaching materials.

Chapters 4 and 5 outline the cornerstones of the empirical research such as research design, research questions, the empirical setting, and the employed analysis frameworks.

The detailed analyses of teaching materials and vocabulary teaching are presented in Chapter 6. Here, four analyzed horticultural reading texts are closely investigated with regard to readability levels and lexical technicality. This is followed by the analyses of lesson transcripts displaying the classroom discourse of horticultural English lessons observed. The individual modes of vocabulary explanations are illustrated via sample extracts from the transcripts. Finally, all strategies and their ways of implementation are summarized.

The discussion in Chapter 7 focuses on the correlation between the results of the material analyses and actual lesson design. This perspective results in a comprehensive picture of the teaching of English to prospective landscape designers. Next, the analyses of vocabulary explanations are summarized and both their effective implementations and potential improvements are discussed. Finally, recommendations for the selection of materials as well as the use of them in the horticultural English classroom are put forward.

2. Specifying ESP

This chapter sets out to provide a theoretical overview of English for specific purposes (ESP). After a brief outline of the historical background of ESP, particular emphasis will be laid on both the typical characteristics and the different types of ESP, thus illustrating the wide-ranging discussion in literature when it comes to defining and classifying ESP. Finally, the roles of the ESP teacher as well as ESP and its relations to language skills will be described.

2.1. The development of ESP

Teaching English for specific purposes evolved in the 1960s (Kennedy & Bolitho 1984: 7; Dudley-Evans & St John 1998: 1). While ESP then was widely assumed to be “a separate activity within English Language Teaching (ELT)” (Dudley-Evans & St John 1998: 1), Kennedy & Bolitho (1984: 7) stress the fact that ESP, especially in its beginnings, heavily relied on traditional ELT approaches and thus was not independent at all. Texts in early ESP courses generally aimed at a more literary audience (instead of a scientific one) and they were taught via reading and follow-up explanations of certain vocabulary items. Together with (a) the lack of a didactic definition of reading, (b) the vocabulary explanations serving as mere comprehension checks, and (c) a course design ignoring the learners’ subject areas and thus their particular needs (Kennedy & Bolitho 1984: 8), ESP initially failed to be specific in its teaching and learning.

Following Hutchinson & Waters (1987: 14), ESP experienced its real development and professionalization due to three essential factors. First, new beliefs about language use were considered. Secondly, new views on language learning came to the fore. Thirdly, attention was paid to the learners’ needs. In what follows, the development of ESP via these three predominant factors is outlined in five stages (Hutchinson & Waters 1987: 9-14).

A) Register analysis

In general, in the 1960s and 1970s famous ESP researchers such as Swales (1988) and Strevens (1988) paid particular attention to the identification and comparison of linguistic features of individual registers such as Electrical Engineering, Biology, or General English (Hutchinson & Waters 1987: 9). However, the researchers’ register analyses struggled to detect any grammatical and lexical features that were unique to one of the aforementioned registers (Hutchinson & Waters 1987: 10). At the same time, this particular focus on linguistic forms triggered investigations in both material and syllabus design according to the learners’

needs (Hutchinson & Waters 1987: 10). This stage is generally referred to as “[t]he [e]arly [y]ears” of ESP research (Johns 2013: 7).

B) *Rhetorical or discourse analysis*

Going beyond the sentence level and the analysis of individual grammatical and lexical features, this stage focused on organizational patterns and the process of creating meaning in a longer stretch of discourse. Hence, an ESP course should reflect the communicative repertoire by which specific rhetoric functions are realized (Hutchinson & Waters 1987: 10-11). As an example, the specific language of observation and description played a vital role in such ESP syllabuses (García Mayo 2000: 35). Furthermore, the reasons for the choice of certain rhetorical techniques and the underlying purpose of the writer or speaker were meant to be central elements in the syllabus. This stage of ESP development took place in the second half of the 1970s (García Mayo 2000: 33).

C) *Target situation analysis*

During the 1980s (the “[r]ecent [p]ast” of ESP study (Johns 2013: 7)), the focus of ESP research shifted towards the situations the learners are likely to experience in their working processes. Close analyses of the linguistic characteristics of target situations served as the basis for both syllabus and course design. Hutchinson & Waters (1987: 12) state that such analyses are well known as “*needs analysis*” [original emphasis], but they suggest to employ a term coined by Chambers (1980: 29) that foregrounds the investigation of real life situations, namely “target situation analysis”. Nevertheless, like in the first two stages the main concern of ESP research during the 1980s was the analysis of linguistic features. This view was complemented by turning to the investigation of skills and strategies with regard to ESP.

D) *Skills and strategies*

Viewing learners as thinking beings, this fourth stage of ESP development aimed at describing cognitive processes that underlie language use. Hence, the analysis of particular linguistic features was replaced by investigating the processes of interpreting and reasoning (Hutchinson & Waters 1987: 13) in order to understand the process of comprehension. This stage particularly relied on reading and listening strategies since they were meant to trigger thinking processes to a great extent. Students should become aware of how to create meaning from both written and spoken discourse (Hutchinson & Waters 1987: 14).

E) *A learning-centered approach*

While all previous stages take into account language use, this fifth stage in ESP development is concerned with language learning. Hutchinson & Waters (1987: 14) regard the focus on language use as being necessary for formulating course objectives, but such a language-centered view might not lead to a “truly valid approach to ESP” (Hutchinson & Waters 1987: 14). ESP only becomes “learning-centered” (Hutchinson & Waters 1987: 14) and thus successful by analyzing the skills the learners need to perform in their working activities and by designing a course that offers stimulating and non-repetitive tasks. Moreover, the teacher needs to carefully observe the efforts and improvements of the learners in order to provide valuable hints and recommendations for further learning. Hutchinson & Waters (1987: 168) illustrate this efficient approach by comparing three different types of sports coaches. While the first coach exclusively considers the physical structures (i.e. the language), the second coach also takes into account skills and the teaching of background information with regard to different muscles (i.e. skills and strategies). The third coach, then, relies on the whole set of learners’ needs, elaborated course design, and his/her specific roles and thus represents the learning-centered ESP approach. According to García Mayo (2000: 42), the learning-centered approach persists to be the dominant ESP trend in the new millennium.

The description of the historical development of ESP via five stages, as outlined by Hutchinson & Waters (1987: 9-14), is in accordance with the view of Gollin-Kies et al. (2015: 28), who propose that ESP, and Languages for Specific Purposes (LSP) in general, has evolved from a “theory-driven” stage (cf. Hutchinson & Waters’ early language-centered stages) to a more “practice-driven” one (cf. Hutchinson & Waters’ stage of target situation analysis). This progress is mainly based on the emergence of genre studies and corpus research, the former focusing, for instance, on the development of learner genre awareness and the latter particularly investigating written academic genres. During this “[m]odern [a]ge” (Johns 2013: 13), ESP research has increasingly become data-driven, so that, apart from genres and corpuses, factors like classroom interaction, workplace communication, context, motivation, and collaboration between language experts and professionals in their fields are observed and analyzed in order to successfully merge “professional practice and theoretical underpinnings” (Gollin-Kies et al. 2015: 28). This historical development is succinctly summarized by Upton (2012: 14) in the following table (p. 6).

Table 1: The historical development of ESP research perspectives (Upton 2012: 14)

	Halliday, Stevens & McIntosh (1964: 189)	Stevens (1977: 150)	Dudley Evans & St. John (1998: 4)	Belcher (2004, 2009)
Needs	Identify the “specialized” language used in specific contexts that learners need to know	Focus on “language-using purposes of the learner”	“Designed to meet specific needs of the learner”, including wants, skill/ knowledge gaps, etc.	“First and foremost (before, during, and even after instruction) finding out what learner needs are” (2009: 3)
Language Analysis	“Detailed studies of restricted languages and special registers (...) used by the particular persons concerned”	Focus on “communicative needs” and “language-using purposes” that are restricted (by vocabulary, language skills, themes, etc.) to those “required by the learner’s purposes”	“Centred on the language (grammar, lexis, register), skills, discourse and genres appropriate to these activities”	Emphasis on “social-situatedness” of language use (2004: 166); understanding of language use in specific contexts is essential – using a variety of analyses
Materials & Methods	Determine “appropriate” and “extra specialized” teaching materials	Use of methodology “appropriate to the learning/teaching situation”	“Makes use of the underlying methodology and activities of the disciplines it serves”	“Developing or adapting materials and methods to enable needs-responsive instruction” (2009: 3)
Focus	Words and structures	Texts and purposes	Learners and genres	Contexts and interactions

2.2. Characteristics of ESP

In order to define English for specific purposes, different authors rely on different descriptions and distinctions, often overlapping in their basic ideas but differing in individual terms.

As a general point of departure, ESP “typically” (Marra 2013: 176) relates to language teaching and learning, although ESP plays, for instance, also a crucial role in workplace discourse research (Marra 2013: 176). Nevertheless, ESP is mainly concerned with “preparing learners to use English within academic, professional, or workplace environments”

(Basturkmen 2006: 17). This pedagogic facet of ESP is especially highlighted in Paltridge & Starfield's definition (2013: 2) that reads as follows:

English for specific purposes (ESP) refers to the teaching and learning of English as a second or foreign language where the goal of the learners is to use English in a particular domain.

Following the above quote, ESP particularly considers the learners, their goals, and the relevant professions or disciplines those learners stem from or are aiming for. In what follows, this specific link between ESP and pedagogy is investigated in detail in order to reach a comprehensive characterization of ESP and its nature.

To begin with, Robinson's definition of ESP shall be considered. According to her, ESP is "goal directed" (1991: 2), meaning that learners aim at improving their study- or work-related English proficiency. Also Smoak (2003: 27) highlights this point when writing that ESP is not about "merely passing an English class or exam" but in fact aims at the successful performance of real-life tasks "relevant for [the students'] work or specialist study" (Robinson 1991: 3). Such an explicit consideration of goals can only stem from a close scrutiny of what the learners have to perform via English, i.e. their learning needs. Here, the already mentioned (in 2.1.) and preferable term 'target situation analysis' enters the stage, although Robinson uses the term "needs analysis" (1991: 3). Robinson clearly emphasizes that both the goal-directedness and the needs analysis represent two criteria that are inevitable when talking about ESP. Deriving from these criteria, Robinson presents further aspects that "do not always apply" and hence they "may be seen as characteristics rather than criteria" (Robinson 1991: 3). In the following, these characteristics are summarized:

- ESP is generally taught to adults, i.e. to students in tertiary education or to "experienced members of the workforce" (Robinson 1991: 3).
- ESP primarily focuses on learners who have experienced EGP (English for General Purposes) classes beforehand. Teaching ESP to beginners, however, is still possible.
- ESP courses can be designed for both students sharing the same subject area and learners with different specialist background.
- ESP is *not* defined by specialist language and content. Instead, specialist activities and "a demonstrated need" for specialist texts are typical for an ESP course (Robinson 1991: 5).

Robinson's characteristics of ESP prove to be a good starting point for investigating other definitions and descriptions of ESP. Her two criteria of explicit goals and the learners' needs are also reflected in the dictionary entry in *The Encyclopedic Dictionary of Applied Linguistics* (Johnson & Johnson 1998: 105): "[T]he term 'ESP' describes language programmes designed for groups of individuals who are learning with an identifiable purpose

and clearly specifiable needs”. Here, the focus is precisely on the learners and not on the language. Therefore, particular emphasis should be placed on Robinson’s last bullet point in the above enumeration that does not primarily stress the aspect of specialist language and content with regard to defining ESP. Such a view is also shared by Hutchinson & Waters (1987: 18), who claim that “ESP is *not* a matter of teaching ‘specialised varieties’ of English” [original emphasis] since the preponderance of linguistic features is highly likely to be found in all English use. The small number of certain features dependent on the target situation does not pave the way for an autonomous special form of language.

Furthermore, Hutchinson & Waters (1987: 18) state that, viewed from the learner’s point of view, ESP does not make a difference with regard to the learning process. Learning EGP or ESP does not necessarily result in completely opposed learning experiences. It seems as if ESP is congruent to other forms of language learning and teaching, meaning that there is “no such thing as an ESP methodology” (Hutchinson & Waters 1987: 18). This ostensible didactic lack in specificity is also pointed out by Robinson (1991: 5), who writes that “perhaps [...] [it] is not so much teaching English for specific purposes but teaching English to specified people”, which ESP research should consider. Hence, ESP is not mainly defined by its language or methodology but by its learners:

Understood properly, [ESP] is an approach to language learning, which is based on learner need. The foundation of all ESP is the simple question: Why does this learner need to learn a foreign language? [...] ESP, then, is an approach to language teaching in which all decisions as to content and method are based on the learner’s reason for learning (Hutchinson & Waters 1987: 19).

Following this quote, ESP teaching derives from the learners’ reasons for learning. This may certainly be true with regard to the teaching of English for general purposes (EGP) as well, but a notable difference needs to be addressed. While EGP learners can be assumed to have an “integrative” motivation that primarily aims at cultural enrichment via communication with the target language community (Gardner & Lambert 1959: 267), ESP-students mostly pursue explicit utilitarian goals (e.g. professional or academic success) via an “instrumental” motivation (Gardner & Lambert 1959: 267). Hence, the above-quoted consideration of learners’ needs has to distinguish between integrative demands and instrumental needs, with the latter paving the way for an ESP-approach to language teaching.

Turning from learning to teaching, ESP at first sight is not a distinct didactic trend. As pointed out above, when it comes to ESP teaching there does not seem to be any specific,

predetermined set of ESP methodology. According to Hutchinson & Waters (1987: 19), ESP does not trigger a particular teaching style, but actually serves as “an approach to language teaching”. Such a perspective is also adopted in the following dictionary entry found in *The Routledge Encyclopedia of Language Teaching and Learning* that stresses the manifold configurations of ESP within ELT:

English for specific purposes (ESP) refers to the teaching and learning of English for an instrumental purpose – work or study related – and embraces a great diversity of language teaching and learning situations around the world (Byram 2004: 196).

This “diversity of language teaching and learning situations” is furthermore highlighted by Strevens (1988a: 2), who sees a weak connection between ESP and definite teaching strategies when he writes that ESP “may not be taught accordingly [sic] to any pre-ordained methodology”.

On the contrary, Gollin-Kies et al. (2015: 126) assign the teaching of language for specific purposes (LSP) a special methodology since the language teaching pedagogy in LSP classrooms explicitly relies on “routines, practices and assumptions of the targeted discipline or workplace“. Hence, they claim that LSP (and thus ESP) teaching and general language teaching (like ELT) clearly differ in terms of pedagogic approaches and activities. Here, Basturkmen (2006: 114-131) contributes to the idea of a specific LSP/ESP methodology by providing concrete examples of activities found in ESP courses around the world. At the Cukurova University in Turkey, for instance, divinity students deal with specialized texts (e.g. relating to the topic of religious festivals), which, after a period of self-study, are discussed in a plenary setting with regard to linguistic features and meaning (Basturkmen 2006: 116). While this ESP activity pays particular attention to the comprehension of subject-specific texts, another example considers language production with regard to target situations, namely the “Workplace Project Team Meeting Simulation” (Basturkmen 2006: 126). Here, students have to arrive at decisions with their colleagues like in real team meetings. These examples demonstrate in which ways ESP offers tailor-made activities to learners of English, meaning that the learners and their specific background are especially taken into account. In particular, the considerations of the students’ specialism like in the case of the divinity students and of the authentic profession-related purpose of the team meeting in the second example *can* be part of EGP lessons, but they *always* should play central roles in ESP-settings.

Similarly, Dudley-Evans & St John (1998: 4) explicitly support the claim that ESP features an autonomous and tangible methodology. In their definition of ESP they hold the view that (a)

ESP teaching has to rely on the practices of the respective disciplines (e.g. problem-solving methodology of academic study) and that (b) ESP classroom interaction may considerably differ from the one found in EGP classes. Furthermore, they reject Robinson's claim of ignoring specialist language when defining ESP. Based on needs analysis, activities for an ESP course are defined. These activities, however, require students to make use of certain "registers, genres and associated language" and thus Dudley-Evans & St John (1998: 4) see language as an inevitable feature for defining ESP.

In particular, Dudley-Evans & St John's definition of ESP reads as follows (1998: 4-5):

1. Absolute characteristics:

- ESP is designed to meet specific needs of the learner;
- ESP makes use of the underlying methodology and activities of the disciplines it serves;
- ESP is centered on the language (grammar, lexis, register), skills, discourse and genres appropriate to these activities.

2. Variable characteristics:

- ESP may be related to or designed for specific disciplines;
- ESP may use, in specific teaching situations, a different methodology from that of general English;
- ESP is likely to be designed for adult learners, either at a tertiary level institution or in a professional work situation. It could, however, be used for learners at secondary school level;
- ESP is generally designed for intermediate or advanced students. Most ESP courses assume basic knowledge of the language system, but it can be used with beginners.

Learner needs, an ESP methodology, and specialist language are at the core of this ESP definition. While the latter two are in contrast with Hutchinson & Waters' (1987: 19) as well as Robinson's (1991: 3-4) views, the focus on learner needs is shared by all. Furthermore, Dudley-Evans & St John's perspective of ESP primarily targeting adult learners and its simultaneous potential for teaching English to beginners follows Robinson's ESP definition.

All in all, ESP is not a "particular [...] product" (Hutchinson & Waters 1987: 19) that includes detailed instructions on how to teach, but in fact it is a *modus operandi* for "reapprais[ing] the principles and practices" (Widdowson 1983: 110) of ELT when it comes to "teaching English to specified people" (Robinson 1991: 5). This *modus operandi* amplifies the field of ELT, as explained in the following paragraph.

With regard to the different degrees of specificity in ELT, Dudley-Evans & St John (1998: 9) propose a “[c]ontinuum of ELT course types” [original emphasis] (see Figure 1). According to them, English language teaching constantly oscillates between “clearly definable General English courses” and “very specific ESP courses” (Dudley-Evans & St John 1998: 8).

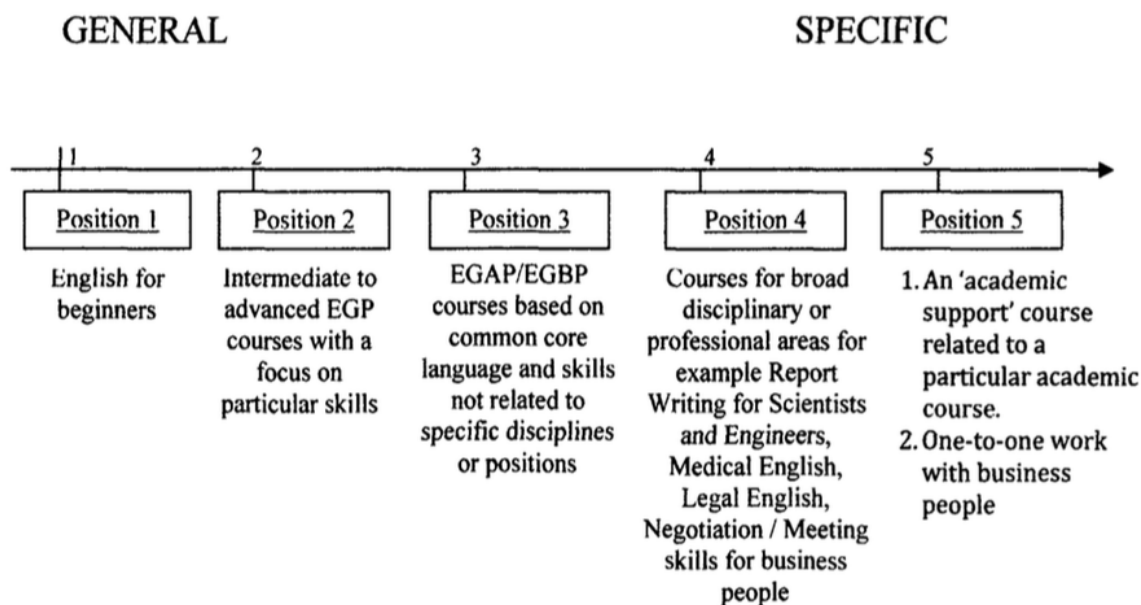


Figure 1: Continuum of ELT course types (Dudley-Evans & St John 1998: 9)

As Figure 1 shows, Positions 1 and 2 are clearly characterized by the learners' level and an orientation towards English for general purposes (EGP), whereas Positions 4 and 5 are primarily defined by a focus on particular skills and needs related to certain subject areas. Position 3, then, represents the threshold where EGP transitions into the ESP realm since it takes into account essential skills but does not pay attention to precise subject areas.

Given the fact that “[t]he ultimate goal of English learning is not to learn, but to apply” (Wei 2012: 1878), this continuum illustrates how ELT enables English learners to employ the language according to general or highly tailored contexts. Now, ESP, as a *modus operandi* for reconsidering ELT, approaches ELT by elongating the ELT continuum. In this way, learners of English can choose a position along this continuum that fits them best, meaning that different nuances of ELT correspond more adequately to different types of English learners.

When defining ESP, one particular question often remains unanswered, namely ‘What does the S in ESP stand for?’ Throughout the aforementioned definitions of English for specific purposes, the adjectives ‘specialized’, ‘specified’ and ‘specific’ are frequently used. In

particular, Dudley-Evans & St John write of “specific needs”, “specific disciplines”, and “specific teaching situations” (1998: 4-5). Considering the etymological background, ‘specific’ means “having a special quality” (Online Etymology Dictionary 2016). Such a special quality seems to be the common denominator when talking about ESP learners, ESP teaching, and ESP disciplines. Douglas (2000: 7) defines this quality as “precision”. Language used in a certain discipline or profession is precise, and thus specific, if its speakers are able “to speak and write more precisely about aspects of the field that outsiders sometimes find impenetrable” due to the presence of characteristic features on the levels of lexis, semantics, syntax, and phonology (Douglas 2000: 7). Put differently, specific language use can serve as a precise social marker, signifying a particular professional community. Such a view directly contradicts Hutchinson & Waters’ perspective (1987: 18) that does not see a notable difference in “all English use” and in English for discipline-related target situations.

Similar to Douglas’ definition of the S in ESP is Hyland’s point of view. Like Douglas, he stresses the ability of participating successfully in a subject-specific discourse when he writes that “equipping students with the communicative skills to participate in particular academic and professional cultural contexts” should represent the chief purpose of ESP (Hyland 2002: 393). Hence, being precise in terms of language use as well as in the teaching of communicative skills are two major characteristics that make ESP specific.

Summing up, ESP directly relates to the field of language teaching (Basturkmen 2006: 17; Paltridge & Starfield 2013: 2) and provides a chance to see the traditional field of ELT in a new light (Widdowson 1983: 110). As regards ESP methodology, it remains debatable if such a characteristic system does exist. This debate, however, shifts the focus towards specified learners and specialized language and thus boosts considerations with regard to ESP syllabus and course design, ESP material development, the categorization of different ESP types, and the roles of ESP instructors. ESP methodology is the terminological point of departure for the analysis of the specific interplay between specified learners’ needs and specified teaching material as well as of the specific interaction between ESP learners and ESP teachers. Given the fact that ‘specific’ equals ‘precise’, ESP is characterized by such precise interplays and interactions. This ultimately leads to the next questions, raised by Gollin-Kies et al. (2015: 5): “[H]ow specific [i.e. precise] do we need to be? And, indeed, specific [i.e. precise] about what?”

2.3. Types of ESP

The specificity of English for specific purposes is “becoming harder and harder to capture in anything like a single stop-action frame” (Belcher 2006: 134). Manifold assessments of learner needs, a growing number of target situation analyses, and the global spread of English as a lingua franca (ELF) and thus its significant role in many disciplines and professions (cf. Nickerson 2013), gradually exacerbate the attempt to describe ESP. In other words: “ESP is not a monolithic universal phenomenon” (Hutchinson & Waters 1987: 9). The vivid picture of ESP and its various manifestations can be illustrated best by (a) describing the major trends in classifying ESP, by (b) briefly considering the role of ESP as a school subject, and finally by (c) demonstrating the wide- and narrow-angled perspective of ESP course design.

One common classification of different ESP programs relies on the use of the two labels English for occupational purposes (EOP) and English for academic purposes (EAP). The acronym EOP is synonymous to EVP (English for vocational purposes) and VESL (Vocational English as a second language) (Hutchinson & Waters 1987: 17) and includes “work-related needs and training” (Robinson 1991: 2). Here, Kennedy & Bolitho (1984: 4) give the examples of doctors, who need to interact with their patients, and of technicians that need to understand operation manuals. These examples of EOP are in line with Dudley-Evans & St John’s (1998: 7) definition, who see EOP as an umbrella term for English for “professional purposes in administration, medicine, law and business” and for “vocational purposes for non-professionals” like in the above example of the technician. However, Dudley-Evans & St John (1998: 7) emphasize that English for medical purposes can be studied by both student doctors and practicing doctors, meaning that English for medical purposes does not solely belong to EOP (if studied by practicing doctors) but in fact is also an important branch of EAP (if studied by medical students). In general, Hutchinson & Waters (1987: 16) state that the distinction of EOP and EAP “is not a clear-cut [one]: people can work and study simultaneously”.

Before exclusively turning to EAP, the ESP strand of EOP shall be described in more detail. In his outline of purposes of English, Jordan (1997: 3) labels EOP as EPP (English for professional purposes) and mentions the examples of doctors, airline pilots, and hotel staff (see following page, Figure 2).

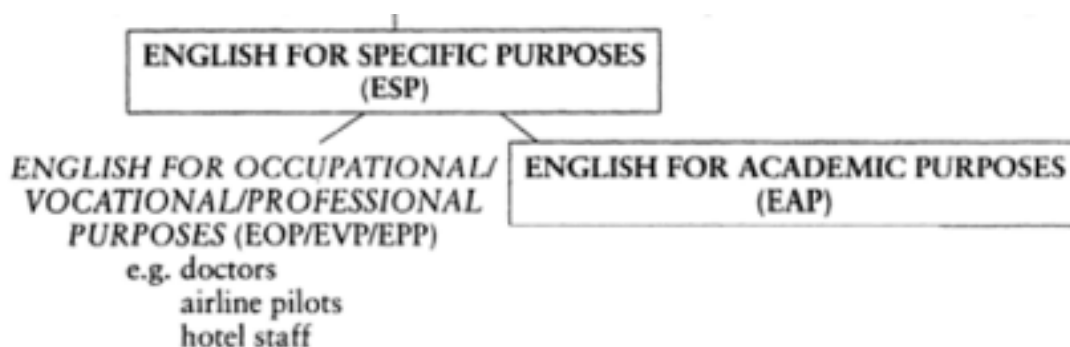


Figure 2: Purposes of English (Jordan 1997: 3)

As Figure 2 illustrates, the EOP/EPP division serves as the counterpart to EAP. Basturkmen (2010: 6), however, relies on two separate categories of EOP and EPP when opposing work-related purposes to EAP. This is illustrated in Figure 3.

Branch	Sub Branches	Example
English for Academic Purposes (EAP)	English for General Academic Purposes (EGAP)	English for academic writing
	English for Specific Academic Purposes (ESAP)	English for law studies
English for Professional Purposes (EPP)	English for General Professional Purposes (EGPP)	English for the health care sector
	English for Specific Professional Purposes (ESPP)	English for nursing
English for Occupational Purposes (EOP)	English for General Occupational Purposes (EGOP)	English for the hospitality industry
	English for Specific Occupational Purposes (ESOP)	English for hotel receptionists

Figure 3: Areas of ESP-teaching (Basturkmen 2010: 6)

As Figure 3 shows and unlike in Jordan's definition (1997: 3) EOP is not placed on a par with EPP. In fact, EPP here is independent of the idea of EOP. Although Basturkmen (2010: 5) refers to the examples of teaching English to "doctors, pilots and company executives" with regard to EPP and "English for office managers" when it comes to EOP, she remains rather indistinct in her differentiation of EOP and EPP and her reasons for separating those two acronyms. Hence, a close analysis of the terms 'profession' and 'occupation' might shed light on the EOP-EPP-distinction.

Traditionally, a profession is defined by a specifically “stronger formal knowledge and higher educational base than other occupations” (Saks 2012: 2). That is, a comprehensively acquired knowledge (often in the course of several years) in combination with high proficiency in certain skills forms the basis of a profession. Moreover, a profession is characterized by its positive and vital role in a community (Saks 2012: 2). Such a social facet is also pointed out by Welie (2004: 530), who states that a “[professional] status must be granted by the public¹, and the public will enter into the necessary social contract only if the service offered is of vital importance”. Furthermore, professionals “always give priority to the existential needs and interests of the public” (Welie 2004: 531). It is particularly this explicit reference to the public good that distinguishes a profession from an occupation. It must be stated, however, that in the first place each profession is also an occupation (Saks 2012: 2; Welie 2004: 530) but not *vice versa*. As long as a community does not assign professional status to a specific occupation, this occupation remains a simple job that primarily serves the purpose of earning money.

Now, Basturkmen’s view of EOP- and EPP-teaching (2010: 6) can be considered anew: EOP aims at providing people with job-related language proficiency that they can directly apply in order to earn a living. EPP, on the other hand, targets people who experience a certain social, i.e. professional, status (e.g. in the health care sector) and thus it aims at enabling those people to communicate and interact in such a way that ensures their status. Consequently, earning money comes second. Similarly, Csizér & Kontra (2012: 3) report on such a division when they oppose English for Medical Purposes to English for Telephone Operators and English for Airport Personnel. While the former clearly relies on the reputable discipline of Medicine and thus belongs to EPP, the two latter examples describe instances of EOP in which the jobs lack a definite “social contract” (Welie 2004: 530), with the public.

While EOP and EPP primarily focus on skills necessary in the working process, EAP (formerly known as English for Educational Purposes (EEP) (Shing & Sim 2011: 2)) aims at increasing competences that are essential prerequisites for studying, namely “listening to lectures, taking notes, writing reports, reading textbooks” (Kennedy & Bolitho 1984: 4). Moreover, EAP takes into account the language and discourse of a particular discipline in order to equip students to use, for instance, medical or legal English for academic purposes

¹ Here, the term ‘public’ needs to be understood as “private people gathered together and articulating the needs of society” (Habermas 1991: 176). This active momentum of expressing needs may result in the public granting the entity that appropriately responds to those needs professional status.

(instead of occupational ones) (Dudley-Evans & St John 1998: 7). In other words, EAP provides learners with English in order to “*gain access*” to knowledge, whereas EOP supports learners in “*express[ing]/[their already acquired knowledge] in English*” [original emphasis] (Kennedy & Bolitho 1984: 5). According to Dudley-Evans & St John (1998: 6), four major professional areas of EAP can be identified, namely English for Science and Technology (EST), English for Medical Purposes (EMP), English for Legal Purposes (ELP), and English for Management, Finance and Economics. The case of EST, however, needs particular consideration.

English for Science and Technology has a “pre-eminent position” (Hutchinson & Waters 1987: 9) in the history of ESP and it is actually considered as the “main area” of EAP (Dudley-Evans & St John 1998: 7). Robinson (1991: 2) even regards EST as “cutting across” EAP and EOP. Such views especially stem from the research of Swales (1988), who described the general development of ESP by strongly relying on the situation of EST. As a result, EST is occasionally seen as a synonym to ESP, but in fact “EST is simply an important branch of ESP” (Kennedy & Bolitho 1984: 6). Similarly, Hutchinson & Waters (1987: 17) regard EST as a hyponym to ESP, meaning that EST does not represent ESP *per se*.

Apart from categorizing ESP in accordance with professional areas, another widespread classification of ESP takes into account the learners’ experience. ESP courses can be held as “pre-experience” (EOP) or “pre-study” (EAP) courses (Robinson 1991: 3), focusing on “newcomers” (Robinson 1991: 2) to a subject area. Other ESP courses are simultaneously offered with the learners’ job training or studies and thus known as “[i]n-service” (EOP), “[i]n-study” (EAP) (Robinson 1991: 3), or “[d]uring-experience” (Basturkmen 2010: 6) courses. Finally, ESP courses might follow a specific stage in someone’s course of education, thus being “[p]ost-experience” or “[p]ost-study” courses (Robinson 1991: 3). This view on ESP-teaching/learning with regard to time and the experiential status quo is also expressed by Wharton (1999: 42-43), who describes three “models of enculturation” (Wharton 1999: 42) when it comes to ESP genre learning, namely “the induction course, the adjunct course and the apprenticeship or mentoring model” (Wharton 1999: 42). Like pre-experience ESP courses, induction courses are held for learners who have not joined their target community yet or who are about to enter it. The ESP teaching here offers opportunities for practicing “disciplinary discourses and behavior” (Wharton 1999: 43) in the classroom beforehand and thus the learning could be regarded as “in vitro” (Basturkmen 2006: 88). Adjunct courses, on

the other hand, are linked to main courses in which learners acquire specific subject knowledge, while the adjunct ESP course provides space for subject-related language learning. The consecutive structure of induction courses (first, language learning, then joining the target community) is here replaced by a simultaneous approach. Finally, ESP teaching can take place in the form of “a one to one relationship for a sustained period of time” (Wharton 1999: 42), which is known as the “apprenticeship model” (Wharton 1999: 42). Learners are not introduced to a specific discourse via traditional teaching, but they are rather “assist[ed]” (Wharton 1999: 43) in communicating successfully with their fellows. This can, for instance, be implemented by expert-novice-talk with the expert “re-interpreting the novice’s talk in the light of the target discourse” (Wharton 1999: 43).

When talking about classifying ESP, particular attention should be paid to ESP as a school subject. Here, ESP courses are described as “independent ESP” and as “integrated ESP” (Kennedy & Bolitho 1984: 5). The latter one uses English “for learning other subjects”, while the “independent ESP” focuses on teaching English in separate lessons “but with a related content to other subjects” (Kennedy & Bolitho 1984: 5). Such an “independent ESP” course is described and analyzed in the empirical part of this thesis.

Different types of ESP can also be described in terms of course design and course participants. Basturkmen (2010: 55) describes a continuum that distinguishes between “wide-angled” and “narrow-angled” ESP courses. According to her (2010: 56), wide-angled courses are advisable for learner groups with multiple disciplinary backgrounds. With professionals, graduate students, or high schoolers who are connected to a current subject, however, a narrow ESP curriculum and course should be employed since here tailor-made real world activities, materials, and content can consider their particular preknowledge. The examples on the following page (Figure 4) illustrate Basturkmen’s conception of differently angled ESP courses:

Wide angled

1a	Agricultural	English
1b	Agricultural	English Skills
2a	English	for horticulturalists
2b	English	for landscape designers
3a	English	for soil bioengineers
3b	English for soil bioengineers at a specific company	

Narrow angled

Figure 4: The wide- and narrow-angled continuum (following Basturkmen 2010: 55)

1a) Students of different agricultural disciplines attending lectures on a variety of topics such as livestock sciences, plant sciences & viniculture, economy, and technology & environment. Such a comprehensive English course is, for instance, offered as Academic Agricultural English².

1b) Agricultural students explicitly practicing, for instance, reading skills with regard to discipline-specific literature.

2a) Landscape designers, gardeners, and horticultural engineers learning English for work or study purposes, i.e. in-service or in-study. Here, horticulture is a branch of agriculture and thus this level serves as a threshold from particularly wide-angled courses (the agricultural domain) to the narrow ones (manifestations of various horticultural purposes).

2b) Landscape designers from different companies attend an English course in order to learn speaking about a variety of landscape architectural issues such as building ponds, urban planning, or the usage of the latest varieties of crab apples.

3a) Landscape designers with specialization in soil bioengineering³ learning English with regard to their technical expertise.

3b) A landscape architecture company wants to train its employees' job-related English proficiency. In particular, all soil bioengineers should experience a specifically designed language course in order to communicate successfully with participants at the next international soil bioengineering conference.

² Such an ESP course has actually been developed and taught by Dr. Elisabeth Weber at the University of Natural Resources and Life Sciences (BOKU), Vienna, and offered as a lecture series accompanied by classroom sessions since the winter term 2013/14. It was honored with the BOKU Teaching Award 1st Prize in 2014.

³ Soil bioengineering is a technology that uses living plant material as well as materials like rock or geotextiles in order to control, for instance, surficial erosion or the adverse consequences of floods via e.g. live cribwalls, willow walls, or live staking.

According to Basturkmen's continuum (2010: 55), example 1a clearly represents a wide-angled ESP course due to its broad range of topics, its explicit focus on a certain register (Agricultural English) and its wide target group (students from different agricultural disciplines). With the group of landscape designers the ESP course could be categorized as an intermediate (2b) ESP course regarding its wideness since a group of learners sharing the same professional background is addressed, but still a wide range of issues is present. Here, we find what Basturkmen calls an "amalgam of the branches" (2010: 141): Landscape designers, who share the same job designation, but who depict different focus areas depending on which architectural company they belong to. Finally, the soil bioengineers represent a highly specific target group, focusing on the specialized topic of soil bioengineering, and thus they are to place at the narrow end of Basturkmen's continuum (3a & 3b).

As Figure 4 illustrates, each level exhibits a dichotomous structure. Level 1 is divided into 1a and 1b, meaning that the example of Agricultural English lectures (1a) (theoretically) focuses on all facets of this particular variety, i.e. on a wide set of skills and genres. Level 1b, however, clearly deals with particular basic skills such as reading in Agricultural English (Basturkmen 2010: 56). Levels 2a and 2b can be distinguished by their participants. Similar to the semantic relation of the terms 'horticulturalists' and 'landscape designers' of which the former is a hypernym of the latter, 2a represents a hyperlevel that addresses a wider audience, i.e. landscape designers *and* gardeners *and* horticultural engineers, while 2b concentrates on a less heterogeneous group of learners, i.e. on a specific vocation. Both levels 3a and 3b, finally, offer courses for target groups that aim at learning language use related to detailed and well-defined target situations. Here, the course content is adapted most accurately to fulfill the learners' needs (Basturkmen 2010: 57).

In order to answer Gollin-Kies et al.'s (2015: 5) questions, raised at the end of 2.2, ("[H]ow specific [i.e. precise] do we need to be? And, indeed, specific [i.e. precise] about what?"), the following conclusions can be drawn. First, when talking about ESP we need to be precise in terms of abbreviations. This preciseness relies on the distinctions and elaborated definitions of English for occupational purposes (EOP), English for professional purposes (EPP), and English for academic purposes (EAP). Secondly, preciseness is required with regard to time and the learner's experience. ESP courses might be taught as "pre-study" (EAP) courses or as "[p]ost-experience" (EOP) ones (Robinson 1991: 3). Thirdly, ESP can be categorized

according to the wide- and narrow-angled continuum with regard to course design (Basturkmen 2010: 55). Here, preciseness is imperative with respect to the course participants. All in all, it must be stated that we need to be highly specific in terms of ESP types, learner experience, and course participants so that mutual understanding is guaranteed when, for instance, talking about an in-study, wide-angled adjunct EAP course for students of agriculture.

2.4. The ESP educationalist

ESP and its different manifestations are the result of various learners' needs and their links to manifold areas stemming from the academic, professional, or vocational field. In this way, ESP teaching and learning are "parasitic process[es]" (Widdowson 1983: 109), meaning that this interplay of language teaching and specific areas of expertise, knowledge, and skills has to find its way into the ESP classroom. Here, the ESP instructor comes to the fore.

In order to cope with the "eclectic discipline" (Parkinson 2013: 155) of ESP, instructors have to perform several roles. Kennedy & Bolitho (1984: 137-139) state that an ESP teacher has to be, amongst others, a needs analyst, syllabus designer, material developer, course designer, and team teacher. Such a personal union is similarly described by Dudley-Evans & St John (1998: 13), who assign the following "key roles" to an ESP instructor:

- Teacher
- Course designer and materials provider
- Collaborator
- Researcher
- Evaluator

Placing the role of the teacher at the beginning of the enumeration, this view of an ESP instructor is clearly in line with Robinson's "job description for the ESP teacher" (1991: 79), in which she stresses the fact that "first and foremost, of course, the ESP teacher is a *teacher*" [original emphasis] (Robinson 1991: 80). Nevertheless, Dudley-Evans & St John stress the fact that the roles of an ESP instructor considerably exceed the work of teaching by employing the term "ESP practitioner" (1998: 13).

The term 'ESP practitioner', however, seems to underrate the essential pedagogic expertise that an ESP instructor has to rely on. While an 'ESP practitioner' simply appears to constantly shift between the above-mentioned different roles, the underlying professional knowledge that accompanies these performing modes needs to be stressed. In particular, the specific didactic

proficiency that serves as an inevitable prerequisite for providing ESP materials and designing, teaching, and evaluating ESP courses has to come to the fore. These pedagogical aspects in combination with the academic role of a researcher seem to be signified best by the term ‘ESP educationalist’. This concept is employed throughout this thesis when referring to the necessary competences of an ESP teacher and is described in more detail in the following.

During the act of teaching, the ESP educationalist supports language learners who might already possess significant knowledge with regard to their specific subject. Hence, the ESP teacher is not the “primary knower” (Dudley-Evans & St John 1998: 13) of the “carrier content” (Dudley-Evans & St John 1998: 11), i.e. of the content of a task that serves as the thematic point of departure for teaching and learning a specific language. As an example, learning material dealing with water and soil requirements as well as with the growth habits of certain plants might not aim at teaching the learners about the characteristics of these plants (the carrier content) but rather about the language used to come up with such detailed descriptions of plants. This intention of introducing language for compiling plant descriptions represents the “real content” (Dudley-Evans & St John 1998: 11) in which the ESP teacher should be the expert. Consequently, the students-teacher-relationship in ESP lessons differentiates from the one in general ELT lessons since the students are likely to know considerably more about the content, whereas the teacher knows more about the language. Such an imbalance between content knowledge and language proficiency is highly likely to result in classroom interaction that “is much more one of partnership” (Dudley-Evans & St John 1998: 14) and in which the ESP teacher regularly acts like a counselor for a whole group (Kennedy & Bolitho 1984: 140; Dudley-Evans & St John 1998: 14; Ghafournia & Sabet 2014: 3). Individual counseling work frequently occurs in ESP teaching that follows the apprenticeship model described in 2.3. Acting as a counselor includes defining each learner’s needs and diagnosing steps for further improvement (Robinson 1991: 81) and could be summarized best as “a restricted pedagogical therapeutic role” (Ghafournia & Sabet 2014: 3).

Due to the potential disequilibrium between the ESP learners’ noticeable advance in content knowledge and the ESP teacher’s language expertise and counseling role, ESP educationalists should not be tempted to regard themselves as pure advisers for specific language use or even as mere language assistants. Instead of completely relying on their learners providing the subject-specific knowledge and only ‘adding’ selected bits and pieces of specific language, ESP educationalists have to familiarize themselves with the specialized content since they are

meant to be “teacher[s] of English through a subject matter” (Tabatabaei 2007: 82). Hence, views that exclusively regard an ESP teacher as “a language adviser, having equal status with the learners who are often experts in the subject matter” (Sierocka 2008: 34) have to be rejected since the ESP educationalist performs the important role of a teacher. Being both a professional educationalist and an expert in the foreign language, the ESP teacher does certainly not exhibit the same status like the learners. Having planned the course, compiled the material, and selected activities for stimulating ESP lessons, the ESP educationalist is much more in the guiding role than the learners, who await such a directing behavior from their teacher. Still, classroom interaction can take the form of a partnership, as pointed out above, but it must be stressed that this partnership between the ESP teacher and the learners does not represent an “equal status” (Sierocka 2008: 34) and that the ESP teacher is not a colleague of the ESP learners. The ESP educationalist is a teacher in the first place (Robinson 1991: 80) who has to get acquainted with the respective specific subject matter.

For the purpose of gaining remarkable and suitable insights into subject matters of specific disciplines or fields of work, ESP educationalists should work interdisciplinarily with both ESP teachers stemming from other areas of expertise and subject specialists. Although being “typically trained as writing or language teachers” (Parkinson 2013: 155), they should go beyond their own disciplines and become “action-based researcher[s]” (Ghafournia & Sabet 2014: 6), “teacher-researcher[s]” (Potocka & Sierocka 2013: 175), or “collaborator[s]” (Dudley-Evans & St John 1998: 15).

In order to become a competent ESP educationalist, working as a researcher is an inevitable step as highlighted by Gollin-Kies et al. (2015: 126): “The LSP [educationalist] needs a combination of pedagogical and research expertise in order to devise curricula and classroom activities”. According to Potocka & Sierocka (2013: 176), such a research expertise *can* be gained by every teacher, whereas Dudley-Evans & St John (1998: 15) emphasize that it *has to be* acquired anyway. ESP research serves, amongst others, as the basis for “understand[ing] the discourse of the texts that students use” (Dudley-Evans & St John 1998: 15) and therefore ESP educationalists definitely need to “become ethnographers, exploring unfamiliar language varieties, disciplinary cultures and modes, and drawing on scholarship from a wide range of fields to do so” (Parkinson 2013: 155). This researching role should be simultaneously performed with the teaching role so that ESP educationalists gradually develop knowledge and competence in a specific discipline or profession (Tabatabaei 2007: 83). Moreover,

prospective ESP teachers need to be carefully prepared for their independent researching roles as well (Hüttner & Smit 2012: 165). With regard to the type of research, Belcher (2006: 149) argues the case for “more diversity in ESP research” and thus she pleads for investigations of spoken genres instead of written ones and for analyses of spoken classroom interaction via video and audio-taping. Overall, this researching facet of an ESP educationalist does not mean that ESP instructors need to become luminaries in specific areas of expertise overnight (which is completely impossible), but in fact they should attempt to become “professional participants” (Ghafournia & Sabet 2014: 5) or at the very least “educated laym[e]n” (Stevens 1988b: 42).

The development of a professional habitus is furthermore facilitated by the collaboration of ESP educationalist and subject specialists. ESP educationalists usually stem from the (English) language teaching background (Kennedy & Bolitho 1984: 137; Basturkmen 2010: 3-5; Parkinson 2013: 155) or actually *should* derive from the field of language teaching (Tabatabaei 2007: 80; Anthony 2011: 14). This latter explicit call for ESP educationalists being educated in language teaching is based on the argument that in ESP courses the learners should acquire “language through [...] content” (Tabatabaei 2007: 80) and therefore the language teacher is perfectly qualified to teach ESP lessons. As a consequence, such ESP educationalists, being language teachers in the first place, should work together with their respective subject specialists. This could be either done via “*cooperation*” [original emphasis], where ESP educationalists closely investigate target situation tasks or the syllabus of a specific subject and consider these elements in their course design, or via “*collaboration*” [original emphasis] (Dudley-Evans & St John 1998: 16). Here, on a more practical level, language teaching expertise and specialist tasks are conflated, e.g. by teaching a reading task that employs topics taught by the subject specialist as its carrier content (Dudley-Evans & St John 1998: 16). Genuine collaboration takes place if both the subject specialist and the ESP educationalist “team-teach” (Dudley-Evans & St John 1998: 16) lessons. While team-teaching in ESP is also promoted by Perry & Stewart (2005: 572), Ghafournia & Sabet (2014: 4) and Cao, who refers to it as “joint-teaching” (2014: 2512), Anthony remains more skeptical about the effectiveness of collaborative teaching in ESP as he points out that true collaboration is an ambitious aim but in fact difficult to reach since in many institutions “even working with people in the same department is a rarity” (2011: 7). Here, Robinson (1991: 92-93) sees communication between ESP educationalists and subject specialists as well as patience for establishing collaborations as holding the key to successful team teaching.

Finally, ESP educationalists usually take the role of evaluators and examiners. Considering the value and effectiveness of their own ESP courses requires the ESP educationalists to engage in self-reflection (Potocka & Sierocka 2013: 175). Such an introspective view paves the way for the willingness to self-improvement, which is another inevitable need of an ESP educationalist (and in fact of each instructor). This facet of self-improvement is, amongst others, in line with Smoak (2003: 27) and Ghafournia & Sabet (2014: 5). Smoak especially promotes ESP professionalization when she writes that

[ESP educationalists] must be willing and able to prepare [themselves]. [Hence, they] must take advantage of training and professional development opportunities in ESP, and [they] should rely on the expertise of more experienced colleagues (2003: 27).

This necessary obligation of ESP educationalists being lifelong learners is mainly due to the fact that “ESP teaching makes additional demands on teachers” (Basturkmen 2010: 9) as demonstrated in the manifold roles ESP educationalists have to perform. To sum up, these demands manifest themselves in “*more* experience, *additional* training, *extra* effort, a *fresh* commitment, compared with being a teacher of General English” [original emphasis] (Stevens 1988b: 43).

In what follows, examples of specific ESP demands are presented. These insights were gained via an online survey in November 2015, in which ESP teachers of Austrian agricultural vocational schools participated (n = 5, see Appendix 1). These ESP educationalists teach the school subject Englisch-Fachseminar (ENFS) to future enologists, foresters, farmers, or landscape designers, which is described in more detail in 4.3. (p. 51). The survey’s aim was to gain ESP educationalists’ perspectives with regard to the demands of ENFS, of which some shall exemplarily be posed here.

The demand of “*extra effort*” (Stevens 1988b: 43) is reflected in the following statements:

- Materialien müssen selbst hergestellt werden (z.B. Listening Tasks zu online verfügbaren MP3 Ressourcen konzipieren) [Materials have to be designed on my own (e.g. creating listening tasks with regard to available MP3 resources)] (case 62).
- Wir verwenden kein Lehrbuch, weil es das für die Fachbereiche Landwirtschaft und Umwelttechnik nicht gibt, also muss das Unterrichtsmaterial für die einzelnen Module erarbeitet und kopiert werden [We do not use a textbook since none are available with regard to the specialist fields of agriculture and environment engineering, therefore the teaching material has to be developed and copied for each single unit] (case 69).
- Da es keine Lehrbücher gibt verbringe ich viel Zeit (Fach-)Texte aus dem Internet zu kürzen und eventuell zu vereinfachen [Since there are no textbooks, I spend a lot of time pruning and potentially simplifying (specialized) texts from the Internet] (case

70).

- Durch den Anspruch auch inhaltlich kompetent argumentieren zu können bedarf es einer intensiven Befassung mit den behandelten Themen. Da ich kein Experte in den Fachbereichen bin, bedeutet das einen Mehraufwand [Due to the demand for arguing competently with regard to the contents, an intensive involvement with the topics dealt with is needed. Since I am not an expert in the specific disciplines, this involves extra effort] (case 59).

The requirement of “*additional training*” (Strevens 1988b: 43) can be seen in this response:

- [G]roßes Fachwissen nötig, weil sehr spezifische Themen, zB Klonen, Stammzellen, Kläranlagen, etc., [...] Thema muss man vorher selber ‚lernen‘, da man oft in Deutsch nicht weiß, was das ist [Considerable subject knowledge necessary due to highly specific topics, e.g. cloning, native cells, purification plants, etc., [...] the topic must be ‘learnt’ on your own beforehand since you often do not know it in German] (case 64).

“[A] *fresh commitment*” (Strevens 1988b: 43) is expressed in these comments:

- Mein Anspruch die Fachinhalte nicht nur sprachlich sondern eben auch inhaltlich richtig zu vermitteln. Das empfinde ich als eine große und schöne Herausforderung [My aspiration for teaching subject contents correctly not only in terms of language but also as regards content. That is a huge and great challenge] (case 59).
- [E]s gelingt in ENFS auch vermehrt nicht sprachbegabte Schüler zu begeistern [In ENFS it also increasingly works out to motivate not linguistically gifted pupils] (case 62).
- Das Unterrichten von Fachenglisch-Themen macht einfach mehr Spaß als Grammatik [The teaching of ENFS-topics makes simply more fun than grammar] (case 70).

In conclusion, ESP educationalists have to live up to a great variety of roles and tasks. As shown above, the daily working routine is especially demanding, for instance, with regard to material development or the acquisition of specialized knowledge to a reasonable extent so that a successful teaching of specified language is guaranteed. Furthermore, the ideal ESP educationalist goes far beyond the particular requirements of teaching and engages in both ESP research and course evaluation. As pointed out in this chapter, ESP research should particularly be done by teacher-researchers in order to have considerable repercussions on future ESP teaching and further professionalization of ESP educationalists. Additionally, ESP courses need to be constantly revised to ensure a perfect match between a course’s contents, the developments in the specific content areas, and the learners’ needs. Here, the ESP educationalist’s willingness to self-reflection is inevitable. Finally, ESP teaching and learning can unlock its full potential if effective and open reciprocal communication and collaboration

takes place between ESP educationalists and subject specialists. Then, ESP learners experience a teaching precisely to their needs.

2.5. ESP and language skills

Like general English language teaching, ESP has to consider the four major skills of speaking, listening, reading, and writing. Furthermore, the teaching and learning of vocabulary is another highly important facet that embraces all these four skills.

ESP teaching should aim at equipping learners with the knowledge of speech acts relevant to their respective professional field (Basturkmen 2006: 47). As an example, potential hotel receptionist should be trained in employing typical speech acts such as dealing with the check-in/check-out procedures or responding to complaints. Of course, painstaking research of interaction and discourse in the respective target environment has to be conducted beforehand in order to compile an ESP syllabus that appropriately considers those speech acts that are necessary for the learners. Similarly, Feak (2013: 49) claims that the focus in teaching oral ESP skills should shift from language accuracy to pragmatics, cross-cultural awareness, humor, and rapport building. All in all, ESP curricula and teaching should more “consider sociopragmatic awareness in the learning of speech genres” (Feak 2013: 36). This argument is accompanied by the claim that ESP has to take into account more carefully the fact that today’s ESP learners predominantly encounter non-native to non-native speaking situations (Robinson 1991: 32; Feak 2013: 36) and thus should be equipped with language competence that is not native-like but “‘good enough for the job’” (Robinson 1991: 32) and rests upon the concept of English as a lingua franca (ELF).

Furthermore, an ideal teaching of ESP speaking focuses on features that make spoken interaction successful and explicitly introduces them *before* a speaking activity (Dudley-Evans & St John 1998: 111). Such features especially include ways of questioning and active listening. With particular regard to ESP, Dudley-Evans & St John propose “*closed-response questions*” [original emphasis] (e.g. Did the order arrive in time?), “*limited-response questions*” [original emphasis] (e.g. What was last year’s turnover?), and “*open-response questions*” [original emphasis] (e.g. In what ways is that a problem?) (1998: 107-108). All these questions should focus on the content of communicative events the learners are likely to encounter in their respective profession.

As pointed out above, ESP speaking should involve active listening. It must be stated that today active listening is widely regarded as a feature of general language competence, but in fact it has been developed out of management interpersonal skills courses, i.e. in the vocational field (Dudley-Evans & St John 1998: 106). Active listening is characterized by gestures and facial expressions, back channeling (e.g. *mhm*, *right*, *go on*) and questions (Dudley-Evans & St John 1998: 106).

In general, ESP listening closely resembles general ESL listening. Therefore, ESP listening skills cannot be regarded as “an ‘add on’ to a set of skills that learners already possess” (Goh 2013: 58). The processes and problems that ESP and ESL learners encounter when it comes to listening, share many common characteristics. As an example, the recognition of turn-giving cues or the ability of gaining the floor should be mentioned here (Goh 2013: 61).

Nevertheless, ESP learners face additional challenges in fostering their listening skills due to specific vocabulary and specialized discourse structures. Goh (2013: 59) emphasizes that even already acquired technical terms might not be recognized by the ESP learner in a stream of speech. Similarly, idiomatic and fixed expressions in ESP may require more effort to learn and recognize them in specified discourse such as a university lecture (Goh 2013: 59).

The teaching of reading represents a long-standing feature of ESP and was actually the prevalent teaching method in the early beginnings of ESP during the 1960s (Kennedy & Bolitho 1984: 8; McDonough 2010: 471) that exclusively focused on individual sentences, grammar, and register (Hutchinson & Waters 1987: 10; McDonough 2010: 471; Hirvela 2013: 78). Today, Hirvela assigns the aspect of reading a “*situated* nature” [original emphasis] (2013: 91) in ESP, meaning that not individual skills like skimming or scanning for manifold reading situations should be taught, but rather the focus should lie on specific communicative contexts and on authentic texts stemming from the target environment (2013: 79). In particular, ESP students should be taught in extracting relevant information from these texts (Hirvela 2013: 79) and in identifying the author’s stance since “it is another misconception that scientific discourse is attitude-free” (Dudley-Evans & St John 1998: 98). Harwood (2005: 153) goes one step further and promotes the idea of implicit learning complementing the direct teaching of reading skills since “reading texts can raise students’ awareness of salient features of academic prose regardless of whether these features are actually highlighted by the textbook writer or not”.

Writing allows students both to reinforce their learning and to prove their knowledge of respective subject matters. This holds true not only for ESP settings, but also for all educational domains (Hyland 2013: 95). In ESP writing, however, the instructors face a notable difference: Instead of teaching writing, they teach “particular kinds of writing which are valued and expected” (Hyland 2013: 96) by the specific disciplines of the learners. Such a teaching is bound to the goal of making ESP learners aware of their roles in their future community and the expected style of written texts (Dudley-Evans & St John 1998: 118). In this way, ESP learners can practice to deal with the tension between their own creativity and the prescribed norms with regard to written texts. Additionally, they can develop their individual stance and role within their target community since writing, being a social act, socializes writers in their respective professional field. This facet of teaching writing is referred to as the social-constructionist approach (Dudley-Evans & St John 1998: 117-118; Hyland 2002: 390). In order to successfully teach ESP writing as a social act, Dudley-Evans & St John (1998: 118) propose the following four steps:

- Develop *rhetorical awareness* by looking at model texts;
- Practise specific *genre features*, especially moves and writer stance;
- Carry out writing tasks showing awareness of the *needs of individual readers and the discourse community and the purpose of the writing*;
- Evaluate the writing (through *peer review* or *reformulation*) [original emphasis].

Having outlined ESP and its relations to the four major skills in language teaching, the endeavor of specifying ESP in its basic terms is accomplished. Since its inception and the exclusive focus on register, ESP has gradually turned to interaction patterns and discourse of target community situations and thus paved the way for especially considering the needs of future members of manifold professional and vocational fields. In this way, today’s ESP represents one approach of the wide field of ELT, an approach which embraces many different learners of English such as pre-study EAP learners or in-service EOP students. Due to ESP educationalists, who are teachers, researchers, evaluators, and much more, learners of ESP receive the opportunity for practicing speaking, listening, reading, and writing in a specified way, precisely considering both their own needs and the demands of their areas of expertise. This kaleidoscopic nature of ESP can be put in a nutshell: “ESP is, in essence, research-based language education” (Hyland 2013: 107).

In the subsequent chapter, the focus shifts from specifying ESP towards the teaching of a particular language system, namely vocabulary. Vocabulary teaching via authentic reading texts plays a vital role in the ESP lessons analyzed in the empirical part of this thesis and thus fundamental concepts of vocabulary *per se* as well as the teaching of it in both general and ESP settings need to be discussed.

3. Vocabulary teaching in the ESP classroom

Specialized subjects require specialized language. Members of the field of law might regularly talk about *affidavits*, *embezzlements*, or *exonerations*, whereas biotechnologists are likely to refer to *metabolism*, *clinical trials*, and *test tubes*. As outlined in the previous chapter, ESP is designed to meet such specificities of English learners. Since specified discourse largely depends on specified vocabulary, this chapter tackles the question of what vocabulary actually is and in which ways its teaching in ESP settings can be implemented. Particular attention is devoted to the issues of word knowledge, types of vocabulary, and the aspect of technicality. To start with, the term ‘vocabulary’ has to be clarified.

3.1. What is vocabulary?

“Vocabulary is all about words” (McCarthy et al. 2010: 1). This straight answer to the above question actually raises further difficulties such as “What do we count as a word?” (Nation 2001: 6). Therefore, some basic definitions and views on the linguistic field of vocabulary shall be presented here.

At first glance it seems as if a word could be defined as the smallest meaningful unit in a language, which is referred to as “morpheme” (Plag et al. 2015: 72). As long as terms like *school* or *teach* are considered, such a perspective appears to be plausible. Here, words that have an individual meaning when standing on their own are known as “free morphemes” (Carter 1998: 9; Yule 2014: 66), including “lexical morphemes” (Yule 2014: 67) that aim at conveying content and “functional morphemes” like articles, prepositions, conjunctions, or pronouns (Yule 2014: 67). Free morphemes can be accompanied by “bound” ones (Plag et al. 2015: 77) that either serve as “derivational” (Yule 2014: 67) or “inflectional morphemes” (Yule 2014: 68). While the former facilitates the generating of new words or the changing of the word class via adding pre- or suffixes (e.g. *nation* becomes *national*), the latter contributes to the particular grammatical function of a word by highlighting person, number, tense etc. (e.g. *walk* becomes *walking*). As regards the English language, the group of inflectional morphemes consists of eight suffixes (Yule 2014: 68).

Taking into account compound words like *school teacher* radically complicates this initial definitional view. “[D]o they count as one word or two?”, Carter (1998: 5) asks, and McCarthy et al. (2010: 3) answer that such words “have come together to form one item of meaning”, which McCarthy et al. (2010: 3) and Carter (1998: 7) call “lexical item”. So,

individual words can be combined to create a united meaning that is expressed by one lexical item. Put differently, from the morphological point of view, such compound lexical items consist of two lexical morphemes whereas on the lexical-semantic level they clearly represent one lexical item. Apart from compound words, multi-word verbs, phrasal verbs, and idioms belong to the category of lexical items. Carter (1998: 7) mentions here the examples “*to catch up on*”, “*to drop in*”, and “*kick the bucket*” [original emphasis].

Scrivener defines lexical items in a similar way. According to him (2005: 227), collocations (brief common combinations like *to make a difference*) and chunks (multiword combinations that are used like a single word, e.g. *you know what I mean*) should be classified as lexical items. These lexical items, then, form the counterpart to vocabulary items, which Scrivener defines as “single words” (2005: 227). Based on this terminological distinction, Scrivener concludes that teaching “lexis”, i.e.

complete ‘ready-made’ fixed/semi-fixed/typical combinations of words that we can recall and use quite quickly without having to construct new phrases and sentences word by word from scratch using our knowledge of grammar (Scrivener 2005: 227),

is essential and requires appropriate classroom work, focusing on the production and reception of multiword items (Scrivener 2005: 229-230). Here it seems as if lexis had replaced the notion (and teaching) of vocabulary.

Nevertheless, the concept of vocabulary and its consideration of individual words is an important prerequisite for describing language teaching since vocabulary can be defined as “a sub-goal of a range of goals that are important in the language classroom” (Nation 2001: 1). Nation (2001: 7-8) describes four ways for counting words in a language in order to gain insights into the amount of vocabulary needed to use a language successfully. Instead of focusing on the terms of (single) ‘words’ and (combined) ‘lexical items’, Nation employs the terms “[t]okens”, “[t]ypes”, “[l]emmas” and “[w]ord families” [original emphasis] (2001: 7-8). If in a written or spoken statement each separate word form is counted, then the tokens are summed up. The number of tokens is of great interest if the amount of words on a certain page or the total of words spoken per minute is investigated (Nation 2001: 7). Types are counted if questions like “‘How many words do you need to know to read this book?’” or “‘How large was Shakespeare’s vocabulary?’” should be answered (Nation 2007: 7). This means that if the same word is encountered again during the counting process, it is not counted a second time. Lemmas focus on inflected and reduced forms of “headword[s]” (Nation 2001: 7), but they are rather difficult to count since it is unclear how to determine the

headwords, how to count irregular forms, and how to deal with the noun and verb meaning of words like *display* (Nation 2001: 8). Hence, counting word families is much more efficient. Word families “consis[t] of a headword, its inflected forms, and its closely related derived forms” (Nation 2001: 8).

In sum, the words of a language can, depending on the linguistic viewpoint, be classified, amongst others, as morphemes, lexical items, tokens, types, lemmas, or as word families. All these ways of counting words provide the first step for analyzing and categorizing the vocabulary of a language.

Vocabulary serves as a concrete means for expression and thus forms the basis for each speech event. In the course of such communicative events the interlocutor’s communicative repertoire strongly relies on different types of vocabulary with regard to successful language use. Nation (2001: 11-12) provides an overview of the various categories of vocabulary. Function words and words from the famous *General Service List of English Words* (GSL), published by Michael West in 1953 (West 1953), form the group of the so-called “high-frequency words” (Nation 2001: 11). Such words represent the “core vocabulary” (Carter 1998: 34) of a language, which usually stems from “neutral fields of discourse” (Carter 1998: 43). Although the idea of identifying core vocabulary appears to be worthwhile, it must be noted that such a list of central words does not “constitute a core list for pedagogical purposes” (Carter 1998: 47). Hence, high-frequency words can only serve as a point of departure and not as a direct means to an end with regard to the aspect of vocabulary teaching. “Academic words” represent the second set identified by Nation (2001: 12) and they are well summarized in the *Academic Word List* published by Coxhead in 1998 (Coxhead 1998). These academic words cannot be linked to one exclusive subject area and thus they are “more closely related to high frequency vocabulary than to technical vocabulary” (Chung & Nation 2003: 104), the latter representing the third kind of vocabulary identified by Nation (2001: 12). Here, words that exhibit a close connection to a specific subject area are included. It is this particular group of “technical words” (Nation 2001: 12) that plays a vital role with regard to the teaching of ESP vocabulary and therefore it is described in more detail in 3.4. (p. 40). All words “that we rarely meet in our use of the language” (Nation 2001: 12) and that do not fit in the three other groups outlined above are summarized in the category of “low-frequency words” (Nation 2001: 12). These four types of vocabulary shed light on the frequency and

thus on the usefulness of words in a language and the issue of which words learners of that language might actually need (Schmitt 2007: 828).

As already pointed out above, vocabulary influences the teaching and learning in the language classroom (Scrivener 2005: 229-230) by simultaneously pursuing certain learning objectives (Nation 2001: 6). Such a didactic view on vocabulary requires appropriate and precise teaching strategies, which are the topic of 3.3. (p. 37). First, a closer investigation of word knowledge shall be conducted.

3.2. Knowing a word

In order to define efficient teaching strategies for vocabulary teaching, it is necessary to carefully analyze the terms ‘word knowledge’ and ‘learning burden’ in connection with the process of vocabulary acquisition.

As regards the knowledge of a word, Wallace (1982: 27) and Carter (1998: 239) largely agree with each other that *recalling* a word is quintessential. Such a recall should happen *ad libitum* (Wallace 1982: 27) and for the purpose of production (Carter 1998: 239). Next, a word is fully known if the learner is able to apply the grammatical forms and if appropriate “level[s] of formality” (Wallace 1982: 27) or “style-levels” (Carter 1998: 239) are considered. Furthermore, both authors regard the knowledge of connotations and associations together with the proficient use of correct collocations as another vital aspect of word knowledge. In his definition of lexical knowledge, Richards (1976: 83) describes this aspect as “knowing the semantic value of a word”.

Apart from the views shared by Wallace and Carter, both provide some additional aspects of word knowledge. Wallace (1982: 27) stresses the fact that intelligible pronunciation, correct spelling, and the appropriate relation to objects or concepts are of great importance. Carter (1998: 239) further claims that learners know a word if they know about the probability of encountering the word in both spoken and written contexts. This latter aspect of word knowledge absolutely corresponds with Nation’s idea of high-frequency, academic, technical, and low-frequency kinds of vocabulary (2001: 11-12).

Considering an ample scope of experimental research carried out with particular regard to L1 and L2 language acquisition, Nation (2001: 27) compiled a table that illustrates the various aspects of word knowledge.

Form	spoken	R	What does the word sound like?
		P	How is the word pronounced?
	written	R	What does the word look like?
		P	How is the word written and spelled?
	word parts	R	What parts are recognisable in this word?
		P	What word parts are needed to express the meaning?
Meaning	form and meaning	R	What meaning does this word form signal?
		P	What word form can be used to express this meaning?
	concept and referents	R	What is included in the concept?
		P	What items can the concept refer to?
	associations	R	What other words does this make us think of?
		P	What other words could we use instead of this one?
Use	grammatical functions	R	In what patterns does the word occur?
		P	In what patterns must we use this word?
	collocations	R	What words or types of words occur with this one?
		P	What words or types of words must we use with this one?
	constraints on use (register, frequency ...)	R	Where, when, and how often would we expect to meet this word?
		P	Where, when, and how often can we use this word?

Note: In column 3, R = receptive knowledge, P = productive knowledge.

Figure 5: What is involved in knowing a word (Nation 2001: 27)

As Figure 5 shows, Nation uses the form, meaning, and use of a word to highlight the necessity of recognizing and producing a word correctly, knowing its connotations, associations, and derivations, being acquainted with its collocations and showing awareness of its limitations in application. In this way, Nation's (2001: 27) description of word knowledge closely resembles Wallace's and Carter's definitions outlined before. Furthermore, he explicitly employs the concept of "receptive" and "productive" (Nation 2001: 24) vocabulary knowledge in his illustration. Receptive vocabulary knowledge refers to the process of apprehending a word's meaning via the receptive skills of listening or reading. Productive vocabulary knowledge, however, describes the appropriate, i.e. correct, written or spoken performance of a word (Nation 2001: 24-25).

Following Figure 5, receptive vocabulary knowledge with regard to a word's form involves the recognition of a word via listening or reading and the correct identification of its morphemes and their relations to the overall meaning of the word. As regards a word's meaning, the language learner's appropriate interpretation of the particular context

surrounding the given word and the successful deciphering of the underlying concepts of the respective semantic field belong to the receptive vocabulary knowledge as well. Finally, the recognition of correct or incorrect grammatical usage and of typical collocations completes this receptive knowledge (Nation 2001: 26-27).

According to Figure 5, productive vocabulary knowledge includes correct pronunciation, spelling, and grammatical forms. Furthermore, the application of synonyms and antonyms as well as correct collocations and an awareness of the appropriate style and register characterize successful active vocabulary use (Nation 2001: 27-28).

The different types of word knowledge, i.e. the productive and receptive kinds of it, develop largely independently from each other, resulting in the fact that vocabulary acquisition is a “complicated but gradual process” (Schmitt 2007: 831). This steady process of vocabulary acquisition, i.e. of getting to know a word very well, naturally depends on the words and their degree of difficulty with regard to learning. Carter (1998: 195) links a word’s difficulty to its relations with other words in both the L1 and L2, to its “semantic value” (Richards 1976: 83) as well as to its pronounceability, surrounding context, and the mode of learning, i.e. receptive or productive. All these aspects contribute to the overall effort that is necessary to learn a word and are summarized by the term “learning burden”, coined by Nation (2001: 23). This learning burden, however, does not solely rely on the words themselves, but also on the learners and their language backgrounds (Nation 2001: 23).

The learning burden and the various factors of word knowledge presented in Figure 5 (p. 34) directly contribute to a learner’s vocabulary depth. This term refers to the quality of a learner’s word knowledge and is best described as “what the learne[r] knows about [certain] words” (Milton 2009: 13). On the contrary, vocabulary breadth simply describes “the number of words a learner knows” (Milton 2009: 13). Concerning a learner’s vocabulary depth, it can be considerably increased by appropriate learning strategies. Nation (2001: 35) puts forward certain learning strategies with regard to the different aspects of word knowledge (see following page, Figure 6).

Kinds of knowledge		Kinds of learning	Activities
Form		implicit learning involving noticing	repeated meetings as in repeated reading
Meaning		strong explicit learning	depth of processing through the use of images, elaboration, deliberate inferencing
Use	grammar collocation	implicit learning	repetition
	constraints on use	explicit learning	explicit guidance and feedback

Figure 6: Kinds of vocabulary knowledge and the most effective kinds of learning (Nation 2001: 35)

Following Figure 6, the form of a word is learnt best if learners are repeatedly exposed to it, e.g. via reading texts. In this way, the learners deal with the word in their working memory first and gradually continue to store its form in their long-term memory. Such an implicit view of learning based on reading material and reading proficiency is also proposed by Haastруп (1989: 45), who describes learners that successfully employ this strategy as “competent word processor[s]”. Additionally, Nation (2001: 34) adds that a minor extent of explicit learning, e.g. feedback provided by the teacher, might facilitate the learning of a word’s form.

As regards the learning of the meaning of a word, Nation (2001: 34) argues for an explicit approach in which the learning process relies on collaborative discussions between the teacher and the learners. Here, the meaning of a word is explained, learnt, and applied by referring to images, elaborations, and inferences (Nation 2001: 35). As we will see in the empirical part of this thesis, this explicit learning of meaning gains center stage in the ESP lessons analyzed.

Finally, Nation (2001: 35) claims that the learning of how to use a word should happen implicitly with regard to learning collocations and explicitly when it comes to limitations on using the word.

Both the manifold aspects of knowing a word and their relations to vocabulary learning determine one key task of each language teacher, namely providing the learners with true word knowledge. Hence, the focus in the following will shift to the teaching of new vocabulary items with specific regard to ESP teaching situations.

3.3. Teaching strategies

Gairns & Redman (1986: 73-75) describe three basic strategies of conveying the meaning of a new word, namely “visual techniques”, “verbal techniques”, and “translation”. Visual techniques involve the use of pictures, blackboard drawings, PowerPoint slides etc. Furthermore, mime and gesture belong to this group, often “supplement[ing]” and “reinforc[ing]” the conveying of meaning (Gairns & Redman 1986: 73-74). The use of impromptu stories told by the teacher and involving the students via comprehension questions as well as the use of synonyms, definitions, and contrasts form the group of verbal techniques. The method of exemplifying words, e.g. by illustrating the relation of hyper- and hyponyms, and the use of scale that demonstrates gradable items like adverbs of frequency are other examples of verbal techniques (Gairns & Redman 1986: 74-75). Translation techniques, being the third basic teaching strategy in the language-teaching classroom, were traditionally meant to be used “sensibly” (Gairns & Redman 1986: 76) since the learners were otherwise expected to continuously rely on their mother tongue during the lessons. Similarly, recent research indicates that from time to time an L1 translation method might be considerably beneficial with particular regard to “vocabulary expansion” (Joyce 2015: 10) since “meaning [can be] rapidly and accurately conveyed” (Forman 2012: 250).

A similar description of conveying and explaining vocabulary is provided by Waring et al. (2013), who divide teacher-led vocabulary explanations into “analytic” and “animated” strategies (Waring et al. 2013: 251). Like the aforementioned verbal techniques, the analytic explanations strongly feature teacher talk that aims at contextualizing the word via definitions, sample sentences, or dialogue. The latter one is frequently implemented via teacher-initiated “understanding-display sequences (UDS)” (Waring et al. 2013: 253) that encourage learners to participate in explaining, or at least guessing, the meaning of a word. Hence, the question ‘Does anyone know what that means?’ is usually found at the beginning of an UDS (Waring et al. 2013: 253). Going beyond explanatory talk, Waring et al. (2013: 254) describe the so-called “animated approach” that includes simple gestures, gestures involving material in the classroom, and scene enactment. Since this strategy strongly relies on “an ensemble of verbal and nonverbal resources” (Waring et al. 2013: 255), it represents a supplement to the analytic strategies and thus can be compared to the visual techniques referred to at the beginning of this section. Given the fact that the research project in this thesis aims at investigating the use of both analytic and animated strategies in ESP lessons, both categories will be described together with examples in detail in the empirical part (see ch. 6.2., p. 74).

The introduction of new words via visual or verbal support should ideally occur with meaningful (spoken or written) texts in which those words are embedded (e.g. Wallace 1982; Gairns & Redman 1986; Schouten-van Parreren 1989; Carter 1998; Nation 2001). Here, Carter (1998: 213) stresses the fact that learning words in context might be more beneficial for advanced learners than for beginners since the former ones are more proficient in recalling and inferring meaning with the help of the surrounding context. Considering ESP and its learner groups that primarily consist of advanced learners or at least of learners with some experience in foreign language teaching (Robinson 1991: 3; Dudley-Evans & St John 1998: 5), the teaching of vocabulary based on context seems appropriate (Xhaferi 2010: 236).

In what follows, teaching strategies with regard to words that are embedded in a reading text are described. An excerpt taken from teaching material of an ESP lesson on redwood trees and their growth factors (see Appendix 2) serves the purpose of illustration:

Resistance to natural enemies such as insects and fire are built-in features of a coast redwood. Diseases are virtually unknown and insect damage insignificant thanks to the high tannin content of the wood. Thick bark and foliage that rests high above the ground provides protection from all but the hottest fires.
The redwoods' unusual ability to regenerate also aids in their survival as a species. Basal burls, hard, knotty growths that form dormant seedlings on a living tree, can sprout a new tree when the main trunk is damaged by fire, cutting, or toppling. Undoubtedly, the most important environmental influence upon the coast redwood is its own biotic community (Redwood trees, ENFS-teaching material, College for Horticulture and Landscape Design).

To begin with, individual words of the above extract can be taught via making inferences from the context, e.g. *enemies* that together with *Resistance* and the example of *insects* can be understood (Wallace 1982: 52). Next, connections to a certain semantic field can be made explicit and discussed with the learners, e.g. *environmental* and *biotic* that both reflect the ecological theme. Here, also polysemous meanings can particularly be clarified by blackboard drawings that support learners to grasp the underlying word meanings (Wallace 1982: 52; Schmitt 2007: 835). Another strategy focuses on the teaching of word families that equips learners with knowledge about a word's derivations, e.g. *regenerate* that can be explained by resorting to the noun *regeneration* (Schmitt 2007: 836). Finally, words can be taught by analyzing their internal structure and the teaching of word parts such as affixes and stems, e.g. *Undoubtedly* that consists of the four morphemes *doubt*, *un*, *ed*, and *ly* (Wallace 1982: 52; Schmitt 2007: 836).

These four teaching strategies with regard to vocabulary meaning can be effectively employed when reading a text in class. Via collaborative guessing, discussion, and explanation of vocabulary items, the direct communication of word meanings reaches its full potential. Implementing these teaching strategies immediately after reading results in a greater vocabulary depth and guarantees a greater ability of form recall (Sonbul & Schmitt 2010: 253, 257).

The aforesaid teaching strategies are especially efficient for ESP settings, which strongly rely on contextualized language. Such a focus on embedded language structures might derive from the endeavor of directly making use of the language being learnt to achieve success in an area outside the language domain, e.g. occupational advancement. This “utilitarian value” of language (Gardner & Lambert 1959: 267) seems to be a specific hallmark of ESP learners’ motivation. In a study by Tatzl (2011: 265), 44 % of the surveyed students enrolled in the three programs International Management, Advanced Electronic Engineering, and Advanced Security Engineering (FH Joanneum University of Applied Sciences, Graz) reported that “[p]reparation for international workplace” and “internationalisation” are significant advantages of those English-medium master programs. So, the participants in this survey judge English as a means to an end, or in Gardner & Lambert’s words (1959: 267), these students pursue “‘instrumental’” purposes when it comes to learning English. Hence, it seems as if ESP learners display a greater awareness and preference for the teaching and learning of language in context and thus for vocabulary than EGP course participants.

Furthermore, Coxhead (2013: 116) points out that ESP vocabulary teaching is contingent on “key ideas and the language of [the learners’] field”. Therefore, vocabulary teaching in ESP especially targets on supporting the learners “to become fully-fledged members of a particular community” (Coxhead 2013: 116). In order to be a competent member of a certain professional area, active participation and professional interactive behavior are essential prerequisites. Together with vocabulary learning, both of them can be practiced in the ESP classroom via games. Riahipour & Saba (2012) investigated the effect of guessing games, crossword puzzles, and relay word building on vocabulary teaching and classroom interaction in ESP lessons for nursing students. Guessing games required the learners to discover a term by only asking yes/no-questions, crossword puzzles focused on accurate definitions of medical terms, and the relay word building dealt with affixes and stems of medical terms. Based on their results, Riahipour & Saba (2012: 1262) claim that a game-oriented vocabulary

teaching approach increases the level of participation (particularly if the games take place competitively) by positively stimulating the learners' interest and motivation. As a consequence, vocabulary games reduce the learners' "anxiety toward learning and retaining new words" (Riahipour & Saba 2012: 1262). This reduction of the learners' concerns with regard to vocabulary learning might be especially important in ESP settings, in which the learning burden of words is usually perceived as being greater than with general English words (Xhaferi 2010: 236). This, however, raises the question 'What makes ESP words different?' and is discussed in the following subchapter.

3.4. Degrees of lexical technicality

ESP teaching situations are often characterized by the use of English words that do not occur to a great extent in the overall use of English. Being neglected or even not known at all in the EGP realm, ESP words have "high *availability*" [original emphasis] (Wallace 1982: 16) in situations relevant for specified learners. As an example, the word *lignifying* may not be frequently used or even widely known by EGP speakers, but it is a basic, i.e. a highly available, term in the communication between members belonging to the botanical discipline. Coxhead (2013: 127), on the other hand, points out that ESP is also characterized by everyday words that are perfectly known in the general English use, but adopt a specialized meaning as soon as they enter a specific subject-area. For instance, the term *culture* receives a specialized meaning within the agricultural domain, in which a *culture* denotes a plantation. While genuine ESP words generally tend to challenge interlocutors outside the respective specific domain, ESP words stemming from general English use present a great challenge to ESP learners, who have to amplify their word knowledge in terms of meaning (Coxhead 2013: 127).

In the following, different categorization systems for vocabulary items with regard to their specificity, i.e. lexical technicality, are considered. First, the theoretical concepts of technical, semi-technical, and general vocabulary are explained. Then, three methods of analysis for determining the degree of lexical technicality are introduced. This methodological comparison paves the way for selecting the appropriate analytical framework employed in the empirical part of this thesis.

3.4.1. Technical, semi-technical, and general vocabulary

Dudley-Evans & St John (1998: 83) differentiate between “[g]eneral vocabulary that has a higher frequency in a specific field” (e.g. *factor*, *function* in the academic field) and “[g]eneral English words that have a specific meaning in certain disciplines” (e.g. *bug* in computer science or the above example of *culture*). According to them (1998: 83), ESP teaching should explicitly focus on the former category, which they call “semi-technical” vocabulary. The second category is referred to as “technical vocabulary” (Dudley-Evans & St John 1998: 83) and is considered as “not be[ing] the *responsibility* of the ESP [educationalist] to teach” [original emphasis] it (Dudley-Evans & St John 1998: 81). Instead, ESP instructors only have to check the learners’ understanding of technical terms that arise in teaching material in order to guarantee the comprehension of the carrier content. Such a view could be seen as being plausible since the learners might rely on their subject-matter knowledge to interpret the meaning of encountered technical terms and thus technical vocabulary does not appear to require particular attention in the teaching process (Hutchinson & Waters 1987: 166; Smoak 2003: 23).

This position is questioned by Nation (2001: 203) and Xhaferi (2010: 234), who emphasize that technical vocabulary should be taught by the ESP educationalist. Nation (2001: 235) argues that due to the considerable extent of technical terms found in specialized texts, learners need to be prepared and supported to cope with these words.

Apart from technical words such as *auricle* or *photosynthesis*, language learners also encounter “structural” vocabulary (e.g. *are*, *however*), “general” vocabulary (e.g. *table*, *weather*), and “sub-technical” vocabulary (e.g. *engine*, *acid*) (Hutchinson & Waters 1987: 165). The latter corresponds to Dudley-Evans & St John’s term “semi-technical vocabulary” (1998: 83) and represents vocabulary that

is not what is known as high frequency vocabulary and is not technical in that it is not typically associated with just one field. It is however more closely related to high frequency vocabulary than to technical vocabulary (Chung & Nation 2003: 104).

Robinson (1991: 28) summarizes the different degrees of technicality as “specialist vocabulary” (= “technical vocabulary” (Dudley-Evans & St John 1998: 83; Nation 2001: 12)), “sub-technical or general scientific/technical” (= “academic words” (Nation 2001: 12)), and “general and non-academic” vocabulary (= “high-frequency words” (Nation 2001: 11)).

The group of technical vocabulary is a “major concern” (Chung & Nation 2004: 251) for ESP learners. In order to determine the specificity of specialized texts and ESP teaching material, the degree of lexical technicality has to be identified. Chung & Nation (2004: 254), by analyzing a text of anatomy, propose the use of a four-step rating scale that distinguishes between specialized and non-specialized word meanings in the following way:

- Step 1:
Words such as function words that have a meaning that has no particular relationship with the [area of expertise], that is, words independent of the subject matter. Examples are: *the, is, between, it, by, 12, adjacent* [...]
- Step 2:
Words that have a meaning that is minimally related to the [area of expertise] [...]. Examples are: *superior, part, forms, pairs, structures* [...]
- Step 3:
Words that have a meaning that is closely related to the [area of expertise]. [...] Such words are also used in general language. The words may have some restrictions of usage depending on the subject field. Examples are: *chest, trunk, neck, abdomen, ribs* [...] Words in this category may be technical terms in a specific field like anatomy and yet may occur with the same meaning in other fields and not be technical terms in those fields.
- Step 4:
Words that have a meaning specific to the [area of expertise] and are not likely to be known in general language. [...] These words have clear restrictions of usage depending on the subject field. Examples are: *thorax, sternum, costal, vertebrae* [...] [original emphasis] (Chung & Nation 2004: 254).

According to Chung & Nation (2004: 253), steps 3 and 4 can be regarded as the group of technical vocabulary, i.e. words that are “subject related, occu[r] in a specialist domain, and [are] part of a system of subject knowledge” (Chung & Nation 2004: 252).

The above rating scale should be applied by researchers that possess profound subject knowledge of the carrier content of the text. In this way, these researchers can successfully conduct text analyses since they are highly likely to appropriately categorize individual words. The palpable facet of subjectivity can be countered by several analysts that investigate a text independently. In this way, inter-rater reliability is ensured, given that efficient rater training is provided beforehand (Chung & Nation 2004: 253) and that construct validity is guaranteed by each rater asking him/herself “‘How strongly related is the meaning of this word to the [area of expertise]?’” (Chung & Nation 2004: 261).

3.4.2. Methods for classifying vocabulary

The various degrees of lexical technicality described on the previous pages can be demonstrated by applying three different methods of analysis to an excerpt of ESP teaching material about herbs (see Appendix 2). In this way, an informed decision can be reached with regard to the selection of an adequate and applicable vocabulary categorization system in the empirical part of this thesis.

First, I will compare the individual words of the extract to both the frequency lists of the *New General Service List of English Words (NGSL)* (Browne, Culligan & Phillips 2013) and the *New Academic Word List (New AWL)* (Coxhead 2000). Then, Chung & Nation's subjective rating scale will be employed. Thirdly, an analysis with the well-reputed vocab profiler on www.lextutor.ca (Cobb 2016) will be conducted. Here, the computer-assisted comparison of English word lists offers precise percentages with regard to the amount of general, academic, and technical words. In all three cases, types are the unit of counting, which means that each word is only counted once.

Excerpt:

Most herbs require little attention. Shrubs will need regular pruning, often immediately after flowering, to maintain their shape, and this may be combined with harvesting foliage for drying. Herbaceous perennial herbs benefit from division and replanting every few years (Herbs, ENFS-teaching material, College for Horticulture and Landscape Design).

Comparative analysis with NGSL and New AWL:

Table 2: Analysis of ESP teaching material (excerpt) with regard to NGSL (Browne, Culligan & Phillips 2013) and New AWL (Coxhead 2000)

Word lists	Types
NGSL 1st 1000	most, require, little, attention, will, need, regular, often, immediately, after, to, maintain, their, shape, and, this, may, be, with, for, benefit, from, (re)planting, every, few, year
NGSL 2nd 1000	regular, flowering, combined, drying, division
NGSL 3rd 1000	-
New AWL	require, maintain, benefit
Remainder	herbs, shrubs, pruning, harvesting, foliage, herbaceous, perennial

As Table 2 illustrates, the sample text was split up in categories according to the high-frequency words in English for second language learners (NGSL 1st 1000, 2nd 1000, 3rd 1000) as well as to the *New Academic Word List*. While the preponderance of types counted in the excerpt belongs to the most important thousand English words for learners of ESL (= high-frequency words or general vocabulary), only a minor group of five words representing the 2nd 1000 NGSL category (= high-frequency words or general vocabulary) is included in the excerpt. Similarly, the excerpt only features three examples of the *New AWL* (= academic vocabulary, sub-technical, or semi-technical vocabulary), which, however, are also identified by the NGSL 1st 1000 list. Finally, the remainder exhibits seven items that do not correspond to the word lists altogether. Here, the technical vocabulary comes to the fore.

Analysis employing Chung & Nation's (2004) four-step rating scale:

I reached a similar result by employing Chung & Nation's rating scale for identifying technical vocabulary (2004: 254). Based on the definitions of the four-step scale, its examples, and my professional horticultural knowledge, the words of the excerpt were categorized in the following way³:

Table 3: Analysis of ESP teaching material (excerpt) with regard to Chung & Nation's four-step scale (2004: 254)

Steps	Types
Step 1	most, require, little, attention, will, need, regular, often, immediately, after, to, maintain, their, and, this, may, be, combined, with, for, benefit, from, every, few, years
Step 2	shape, drying
Step 3	shrubs, pruning, flowering, harvesting, foliage, perennial, herbs, division, replanting
Step 4	herbaceous

According to Table 3, the technical words can be drawn from Step 3 and Step 4 (Chung & Nation 2004: 253). While the previous analysis identified seven technical words, this investigation revealed the amount of ten technical items, including all seven words from the remainder in Table 2 (p. 43) plus *flowering*, *division*, and *replanting*. The items *shape* and *drying* were assigned to Step 2 since they exhibit a minor relation to the horticultural

³ Please note that this analysis at this point aims at illustrating the application of Chung & Nation's rating scale and thus does not provide an in-depth investigation of teaching material. Hence, no second rater was involved.

discipline. While both of them are well known in general English, *shape* can also refer to the habitus of a plant and *drying* can also denote the specific process of dehydrating leaves or blossoms. However, words like *harvesting*, *foliage*, *perennial*, or *pruning* are more closely related to the horticultural field. Hence, they are included in Step 3. *Herbaceous* is a botanical term *per se* and therefore assigned to Step 4.

All in all it must be stated that the application of Chung & Nation's rating scale requires expert knowledge as well as elaborated considerations and decisions and in fact is "laborious to apply" (Chung & Nation 2004: 261). Using a computer-driven analysis tool such as the vocab profiler on www.lex tutor.ca (Cobb 2016) facilitates the process of analysis and leads to similarly significant results when looking at the group of words that the analysis tool cannot categorize at all. This is shown in the following.

Analysis employing the vocab profiler on www.lex tutor.ca:

The vocab profiler (Cobb 2016), based on Laufer & Nation's lexical frequency profilers, follows the same method like the first vocabulary analysis. It compares a text at hand with the first (1k types) and second (2k types) thousand levels words of English and academic words (AWL types). The remainder is called "offlist" (Cobb 2016) and is highly likely to feature a high degree of technical words, i.e. words "that occu[r] in a specialist domain" (Chung & Nation 2004: 252) and thus are unknown by the word lists. Similar to the comparative analysis using the NGSL and the New AWL, the remainder of words is the centerpiece of this analysis.

Table 4: Analysis of ESP teaching material (excerpt) with regard to www.lex tutor.ca

Type list	Types
1k types	after, and, be, division, drying, ever, few, flowering, for, from, little, may, most, need, often, shape, their, this, to, will, with, years
2k types	attention, combined, harvesting, immediately, regular
AWL types	benefit, maintain, require
Off types	foliage, herbaceous, herbs, perennial, pruning, replanting, shrubs

Table 4 illustrates the great accordance of technical words (off types) with the first comparative analysis (see Table 2, p. 43). Only the term *replanting* is actually listed as an

item belonging to the NGSL in the first analysis and instead the term *harvesting* is included in the remainder. In sum, the process of comparing the words of a given text with frequency lists of both general and academic English words seems to be a useful method of analysis if the lexical technical density of reading texts in ESP lessons should be determined. Due to the computer-assisted analysis, its workability (in contrast to Chung & Nation's time-consuming rating scale), and its calculation of percentages with regard to the vocabulary profile of a text, www.lextutor.ca will be employed in chapter 6.1. (p. 64), outlining the lexical structure of teaching material.

To summarize, different types of vocabulary reflect the specificity of each communicative event or written text. This function of delicate adjustment with regard to conveying meaning makes vocabulary the essential bedrock of English for specific purposes, in which precision plays a vital role (cf. ch. 2.2., p. 6). The teaching of ESP has to consider the various nuances between general English words and specialized discipline-related vocabulary items. As it was shown, teaching techniques that embed the respective item in both analytic, i.e. language-driven, strategies and animated, i.e. illustrative, modes facilitate the process of form recall and thus result in a greater vocabulary depth. This profound consolidation process can be further supported by addressing multiple aspects of word knowledge like form, meaning, and use of a word.

In order to effectively teach the wide spectrum of various vocabulary types, a close analysis of the lexical technicality of the teaching material is inevitable. Here, the ESP educationalist receives insights as regards the necessary specificity and the required strategies of his/her vocabulary teaching. This chapter presented three methods of analysis that aim at determining the lexical technicality of texts and thus also of teaching materials. After the evaluation of a comparative approach based on word lists, Chung & Nation's (2004) rating scale, and the vocab profiler on www.lextutor.ca, the latter has been found highly effective when it comes to identifying the degree of technicality in horticultural teaching material. Before turning to the data analyses, the following chapter presents the research design as well as the basic characteristics of the empirical setting the data come from.

4. General description of the study

In this chapter, the cornerstones of the present study are described. After the outline of the research design and its two research questions, the school and the school subject are presented. Finally, characteristics of the participants, the process of data collection, and the observed lessons are described.

4.1. Research design

The present study aims at investigating the structure of teaching with regard to (specific) vocabulary in the horticultural English classroom. Given the fact that the research focuses on one particular group of learners and their teacher in one specific institution (College for Horticulture and Landscape Design in Vienna) and particular ESP program (Englisch-Fachseminar), this study clearly represents a case study (Creswell 2003: 15; Dörnyei 2007: 151). In general, a case is, amongst others, characterized by such clear boundaries, its “own value or speciality” that justifies the research interest and by the researcher spending considerable time in the natural setting (Dörnyei 2007: 151-152). As regards the “speciality”, the tailor-made teaching of English to prospective landscape designers is a unique subject in the educational system in Austria, which has not been studied before. Thus, a close investigation of some of its teaching strategies seems to be valuable. This inherent specialty makes the present case study an “intrinsic” one since the “case itself is of interest” here (Stake 1994: 237). Concerning the observation period, eight consecutive ESP lessons were observed and recorded via video cameras (finally, six lessons were analyzed; see section 4.5, p. 53). Hence, the present study is “at least partially longitudinal”, which is another specific feature of case studies (Dörnyei 2007: 152).

As regards the data, this case study investigates both horticultural teaching materials and classroom discourse in horticultural English lessons. Such a view on the input and processes of vocabulary teaching requires two distinctive research approaches. First, conducting a lexical analysis of written teaching materials represents a typical quantitative analytical approach in which the extent of both general and technical vocabulary is measured. On the other hand, the teaching of one specific teaching material is analyzed based on video recordings over the course of six lessons. Here, a qualitative approach is adopted, describing the manifold instances of vocabulary explanations occurring in the transcripts. This latter “exploratory nature” (Dörnyei 2007: 39) as well as the statistical lexical analysis of teaching

materials will provide a detailed picture of the phenomenon ‘vocabulary teaching’ in the particular ESP setting at hand.

The research foci on the case ‘ESP-vocabulary teaching at the College for Horticulture and Landscape Design’ are represented in the two research questions:

RQ1:

To what extent do teaching materials of horticultural English feature general, academic, and technical English words and in how far do such words affect readability?

RQ2:

How are vocabulary explanations in the ESP-classroom of ENFS sequentially organized?

The statistical lexical analysis of teaching materials, i.e. the quantitative approach, of RQ1 is complemented by the qualitative description of vocabulary explanations in classroom discourse of RQ2. This combined use of statistical material analyses and the investigation of classroom discourse represents a “mixed methods research” at the levels of analysis (Dörnyei 2007: 24). Consequently, a mixed methods approach results in a database featuring both quantitative (number of general, academic, and technical English words per text) and qualitative (descriptions of different types of vocabulary explanations) information (Creswell 2003: 20; Brannen 2005: 4) in order to aim at “understanding [...] the unitary character” of the analyzed case (Dörnyei 2007: 152).

Applying the mixed methods approach to classroom research allows for an in-depth investigation of the “instructional context”, i.e. of teaching methods, learning tasks, or the curriculum (Dörnyei 2007: 186), since the combination of quantitative and qualitative methods “can broaden the scope of the investigation and enrich the researcher’s ability to draw conclusions” (Dörnyei 2007: 186). Furthermore, a comprehensive research approach seems to be worthwhile due to the fact that each classroom is a “special social event and environment” (Breen 1985: 67), exhibiting an explicit goal-directedness (pedagogic goals, teaching agenda etc.) (Walsh 2011: 20) and “inszeniert [staged]” (Meyer 2002: 1, my translation) discourse and interaction (cf. IRF-sequences). Mixed methods research seems to be able to live up to this complexity of classroom settings.

Classroom-centered research (CCR) traditionally takes into account methods of both quantitative and qualitative approaches and thus employs, for instance, quasi-experimental methods as well as interaction analyses (Richards & Schmidt 2002: 73). Such a wide range of research methods requires diverse research tools and, hence, taping lessons with video cameras and/or microphones has become a quite common observation method (e.g. Grainger 1999; Maroni et al. 2008; Behnam & Pouriran 2009; Smit 2010; Gardner & Mushin 2013; Waring et al. 2013).

Taping lessons “can help us uncover the subtle reality of classroom life” (Dörnyei 2007: 185) since video data provide “high completeness of contexts” and “high capability of recorded non-language data” (Wang & Lien 2013: 2936). Due to the fact that “non-language data” such as body language was expected to be essential with regard to instances of explaining vocabulary, this study planned to employ cameras right from the beginning. In this way, classroom discourse as well as interactional behavior expressed by glances, gestures, and posture could be captured. The camera was positioned in the left corner right at the back of the room so that the whole group of learners and the teacher were recorded. A microphone on the teacher’s desk served as a second recorder. Since the camera was not moved throughout the recordings, the video data provide the view of an observer’s position, which is beneficial when focusing on the processes (i.e. vocabulary explanations) of certain events (ESP lessons) (Wang & Lien 2013: 2937). Moreover, and as recommended by Schramm (2014: 248), the camera operator behaved in a retiringly manner by sitting next to the camera at the back of the room and silently taking notes of the seating arrangements and the course of the lesson.

Although videography in classroom-centered research displays significant advantages, especially with regard to descriptions of didactic and methodological facets of teaching, some drawbacks of this research method need to be addressed. First, a close investigation of the subjective experience of teaching as well as an analysis of the individual learning process cannot be carried out. In order to pursue such research aims, teacher- and/or student-interviews need to be conducted (Pauli 2012: 4). Hence, videography primarily offers an “etic [etic]” research perspective, which enables the researcher to approach classroom data from a neutral and exterior point of view (Schramm 2014: 245). Emic, i.e. subjective, insights can only be gained via introspective methods such as video-based interviews.

Another important aspect of videography belongs to the administrative realm. Using cameras in classroom settings requires the approval at various levels. In the present study the consents of the headmaster, the teacher, and the students had to be obtained beforehand. In particular, the processes of establishing research cooperation with the institution as well as the preparation of the various consent forms and their eventual distribution and collection was time-consuming. As regards the wording of the consent forms, particular ethical issues and aspects regarding data protection laws had to be considered. Here, special attention was devoted to the following aspects:

- Information on the procedure of the study.
- Explicit emphasis on voluntary participation.
- Information on the researcher's contact details and the participants' right of withdrawal at any time.
- Information on data retention.
- Information on transcription conventions, especially on pseudonymous form of names (Schramm 2014: 246-247).

Having outlined the general research design, detailed information on the empirical setting will be provided in the following.

4.2. Description of the school

The College for Horticulture and Landscape Design (Höhere Bundeslehr- und Forschungsanstalt für Gartenbau) in Schönbrunn, Vienna, belongs to the agricultural educational system in Austria that subsumes one University College for Agrarian and Environmental Pedagogy (Hochschule für Agrar- und Umweltpädagogik), 12 agricultural Colleges for Higher Vocational Education, and 96 secondary vocational schools. While the agricultural vocational colleges offer a five-year upper-secondary education ending with matriculation and diploma examination, the secondary vocational schools last for three or four years and provide students with an initial vocational qualification (Ministry of Education and Women's Affairs 2016; Ministry of Agriculture, Forestry, Environment and Water Management 2016a).

The aforementioned twelve agricultural Colleges for Higher Vocational Education focus on nine different disciplines, which are agriculture, agriculture and food industry, agricultural

engineering, bio- and food technology, silviculture, viti- and pomiculture, horticulture, landscape design, and resource and environmental management (Ministry of Agriculture, Forestry, Environment and Water Management 2016b).

Within this educational system, the College for Horticulture and Landscape Design represents a unique institution as it is the only one in Austria that equips teenagers with both general education and specified knowledge of market gardening and landscaping. In addition to subjects like plant production, crop protection, soil science, surveying, or spatial planning, the students are required to do three internships over the course of three years. Here, many students decide to go abroad and work on horticultural farms or with town and country planners. Due to such international practical trainings (and the potential global professional cooperation after graduation), discipline-related English skills need to be acquired, which is done in the subject Englisch-Fachseminar (ENFS).

4.3. The school subject Englisch-Fachseminar (ENFS)

The subject Englisch-Fachseminar (ENFS) ('Vocational English') is taught in the third and the fourth grade in most of the agricultural vocational colleges and three of them also offer it in the course of the fifth year. In all cases ENFS is taught two lessons per week (Wagner-Alt & Jakab 2010).

In general, ENFS pursues two central aims, namely (a) equipping students with the ability to use English for work-related purposes and (b) providing the learners with a sound knowledge of national and international agricultural themes. The first aim, i.e. the focus on language, is clearly expressed in the following curricular statement:

Die Schülerinnen und Schüler sollen [...] Situationen aus der Berufspraxis unter Berücksichtigung der üblichen Kommunikationsformen mündlich und schriftlich beherrschen und an Gruppenaktivitäten mit der Zielsprache als Arbeitssprache teilnehmen können [the students should [...] manage situations stemming from the professional practice with due regard to standard forms of communication orally and in written form and be enabled to participate in team work based on the target language as the language of business] (RIS, Curriculum for agricultural vocational schools 2016a).

The abovementioned "standard forms of communication" are explicitly defined as

Statement, Referat/Fachvortrag, Diskussion, Moderation, Präsentation, Fachartikel, Abstracts, Geschäftsbrief, Verhandlung, Verkaufsgespräch [statement, technical

lecture, discussion, moderation, presentation, professional article, abstracts, business letter, negotiation, pitch] (RIS, Curriculum for agricultural vocational schools 2016a).

Hence, ENFS primarily focuses on imparting knowledge of specific, i.e. profession-related, communication events. In order to manage such speaking events successfully, considerable expertise on specific vocabulary, relevant grammar, and general communications behavior (e.g. structuring a talk, elements of a business letter) is inevitable. ENFS, it seems, has to introduce learners not only to the specified language, but also carefully familiarize them with the “standard forms of communication” (RIS, Curriculum for agricultural vocational schools 2016) that can be found in their respective professional field. In other words, ENFS introduces students to “‘situated language use’” (Basturkmen 2010: 8).

Apart from this reasonable linguistic focus of ENFS, the aforementioned second aim refers to specialist knowledge. ENFS aims at providing its students with agricultural expertise, which is seen as the point of departure for various topics of conversation. This focus on content and its interplay with communication is specified as follows:

Die Schülerinnen und Schüler sollen [...] agrarpolitische, land- und forstwirtschaftliche sowie ökologische Gegebenheiten ausgewählter Länder kennen, soweit sie für die Kommunikation im Berufsleben relevant sind und österreichische sowie europäische Verhältnisse in der Zielsprache darstellen können [the students should [...] know of agrarian political, agri- and silvicultural as well as ecological conditions of selected nations as far as they are relevant for communication in professional life and be able to express Austrian as well as European circumstances in the target language] (RIS, Curriculum for agricultural vocational schools 2016a).

All in all, ENFS represents a school subject in which teachers constantly cross the threshold between a content subject like chemistry or plant production and the characteristics of the English language classroom. Given the fact that ENFS is taught by trained English teachers, who are usually not experts in the respective agricultural domains, it is essential that the roles of researcher and collaborator (cf. section 2.4., p. 20) are fulfilled properly. In this way, ENFS-teachers, like all ESP-teachers, can guarantee professional language teaching based on the own close examination of the subject matters.

4.4. Description of the participants

The recordings took place in the 3rd class (grade 11 in the Austrian educational system), which consisted of 18 pupils. The ages ranged from 16 to 18 years. All students had experienced EFL teaching for at least six years, if they began their school education in an Austrian school. According to the CEFR (Common European Framework of Reference for

Languages) (Council of Europe 2001) and the EFL curriculum for upper secondary (RIS, Curriculum for Foreign Languages 2016b), the students' language proficiency level could be regarded as B1 at the beginning of the seventh year of formal English learning. Hence, in terms of their language level the participants at hand could also be referred to as "independent user[s]" (Council of Europe 2001: 23), who

[c]an understand the main points of clear standard input on familiar matters regularly encountered in work, school, leisure, etc. Can deal with most situations likely to arise whilst travelling in an area where the language is spoken. Can produce simple connected text on topics which are familiar or of personal interest. Can describe experiences and events, dreams, hopes and ambitions and briefly give reasons and explanations for opinions and plans (Council of Europe 2001: 24).

While a noticeable amount of EGP proficiency can consequently be attributed to the participating pupils, their exposure to ESP-teaching has been limited. In fact, ENFS represents the first discipline-related English class for the vast majority of the students. Due to the taping of the lessons right at the beginning of the 3rd class, the data obtained reflects the, from the learners' perspective, very first steps in acquiring vocational English.

As regards the teacher, her considerable experience in ESP-teaching needs to be mentioned. Having started with teaching English for Sanitary and Heating Engineering as well as Electrical Engineering, the teacher's career has particularly focused on English for Horticulture and Landscape Design, English for Academic Agricultural Purposes, and English for Viticulture. Apart from teaching such discipline-related English classes, the teacher furthermore works as a coach for university didactics and academic instruction using English for specific purposes. All in all, the teacher has more than thirteen years of hands-on experience in the teaching of ESP.

4.5. Data collection

The recording of eight consecutive ENFS-lessons took place during September and in the first half of October 2015. Right in the second week of the school year the research project was outlined to the students and actively promoted by the teacher. Consequently, all students (or their parents) signed the consent forms in the course of the following week, so that the taping of the lessons could start (each lesson lasted for 50 minutes). The very first two recorded lessons were not transcribed due to the following reason: During these lessons both the students and the teacher were supposed to get used to the presence of the observer and the camera equipment in the classroom. This seemed to work out very soon since only one or two

references to the camera were made by the teacher in the taped lessons. As regards the students, they all behaved naturally and in their typical manner as confirmed by the teacher.

The teaching material was collected after the process of taping. The teacher was asked for a sample of materials that represents the entire school year (3rd class / grade 11). So, the very first text (“Worms at work”; the one that was taught when taping the lessons), another text from the winter term (“Herbs”), one from the beginning of the summer term (“Redwoods”), and another text used at a later stage in the summer term (“Plants at the Sequoia National Park”) were chosen for a close textual analysis with regard to lexical technicality (see Appendix 2).

4.6. Description of the recorded lessons

When teaching “Worms at Work” the teacher especially relied on a collaborative in-class reading of an article taken from a gardening magazine. During the course of each lesson the students alternately read out one or two paragraphs, which then was followed by the teacher asking questions first with regard to vocabulary and later concerning the content. Hence, the teacher usually asked which words were known or new and then each unknown vocabulary item was discussed. Occasionally, the students raised questions about a certain word and thus *they* shifted the focus towards specific vocabulary explanations. Nevertheless, the predominant pattern of classroom interaction was explicitly governed by the teacher. When it came to questions relating to the content of each reading passage, the teacher elicited re-narrating contributions from the students in which the learners summarized the information just read in their own words. If necessary, further vocabulary was explained after that.

At the beginning of each lesson the teacher included a short recap of words learnt in the previous lesson. This was done by summarizing the main information of how to build a worm compost bin, its benefits and disadvantages, its storage, or the types of worms that can live in such a bin. During such recaps, specific words from the previous lesson automatically occurred and thus were dealt with again (e.g. via a drawing on the blackboard). Another way of recapping vocabulary focused on the process of memorizing individual words more explicitly: The teacher asked the students how many of them could at least remember three new words in both the L1 and L2 from the previous lesson. After some time for thinking, the students raised their hands and the teacher called on individual students, who then stated their items in either L1 or L2. These words had to be orally translated by the peers. Finally,

vocabulary was also repeated by very rapid question-answer-games in which the teacher quickly stated individual words from the reading text in the L1 or L2 and the fastest student provided the answer. Due to its competitive character, this recap method proved to be popular and thus it was employed in several lessons.

5. Research methodology

Before turning to the actual analyses of teaching materials and lesson transcripts, the analytical frameworks for both datasets are presented. First, the method of analysis with regard to teaching materials is described, paying particular attention towards its long tradition as well as its considerable relevance for the use of reading texts in modern ELT (cf. Platzer 2015). Then, the analysis procedure for the classroom transcripts is outlined. Here, the term ‘vocabulary explanation’ (VE) is defined and the different codes are explained.

5.1. Analysis framework for teaching materials

The four examples of teaching material for the horticultural English classroom (“Worms at work”, “Redwood trees”, “Plants of the Sequoia National Park”, “Herbs”) will be analyzed according to their textual, i.e. lexical and syntactic, difficulty. Hence, special attention is devoted to the texts’ general readability and their overall proportions of general, academic, and technical English words.

The calculation of the Flesch-Reading-Ease (FRE) as well as of the Flesch-Kincaid-Grade-Level (FK) serve as the two main factors for gaining insights into the readability of the teaching materials at hand. The use of both the FRE and the FK requires some essential notes on the validity, the application, and the aim of readability formulas. To begin with, a definition of the term ‘readability formula’ is presented:

A readability formula is a mathematical equation that is meant to *predict* the level of reading ability needed to understand a particular piece of prose [original emphasis] (Redish 2000: 132).

Following the above definition, readability formulas aim at prognosticating in how far a certain textual structure requires a specific level of reading ability. This prediction is based on correlating the assumed reading ability of expected readers to the lexical (word length) and syntactical (sentence length) structure of a text. In particular, these latter predictor variables and the term ‘readability’ prompted considerable criticism about the face validity of readability formulas (e.g. Hochhauser 1999; Redish 2000; Schriver 2000). First, the combination of ‘reading’ and ‘ability’ misleads many authors, researchers, teachers etc. into expectations about results concerning the reader’s involvement with a specific text. Readability formulas, however, ignore vital aspects such as the reader’s special background experience, the reader’s interest, the reading purpose, or life experience (Klare & Buck 1954: 13; McGee 2010: 6). Hence, these formulas neglect the active role of each reader and merely

take into account the text and thus they exclusively concentrate on calculating the “reading ability needed” instead of measuring the process of “understand[ing]” (Redish 2000: 132). Secondly, word and sentence length do not shed any light on the successful or non-successful application of reading skills or on the reading experience of one particular reader. In fact, these two variables do not tell us anything about the reader *per se*, but about the text. Consequently, the following question only provides one type of answer:

Q: If a booklet has a readability score of ‘6th grade’, what does this score mean?

A: Does it mean that words and sentences in the booklet are roughly the same average length as words and sentences in textbooks for sixth graders? [Y]es (McGee 2010: 13).

In sum, readability formulas do “*not* [serve] as indicators of comprehension” but work “as a check on difficulty of words and sentences” (McGee 2010: 16, original emphasis).

This checking function of readability formulas is reflected in Klare & Buck’s statement of formulas being “sources of hints for more readable writing” (1954: 3). Put differently, formulas such as the FRE and the FK can serve as a “red flag” (Redish 2000: 136) for unintelligible or less readable texts. As an example, if a text analysis yields a considerable low FRE-score, this might be an indication that a substantial group of readers will struggle with reading this text. Such a case is described in 6.1. (cf. teaching material ‘Plants of the Sequoia National Park’).

The exclusive focus on textual structures makes readability formulas effective “*rating tools* [original emphasis]” (Klare & Buck 1954: 14) with regard to a first analysis of a text’s lexical and syntactic difficulty. In a school setting this, then, can serve as a starting point for the teacher to make inferences and decisions about the use of certain reading texts in his/her teaching or in achievement tests (Platzer 2015⁴). In a second step, the teacher might want to rely on the students’ explicit feedback as well as on his/her own observations of the students’ involvement with a particular text (Redish 2000: 137; McGee 2010: 19) in order to fine-tune the teaching procedure.

In what follows, the two readability formulas known as Flesch-Reading-Ease (FRE) and Flesch-Kincaid-Grade-Level (FK) will be described since they are the analytical points of departure for a close investigation of the teaching material in 6.1. (p. 64).

⁴ In the seminar ‘EFL Testing & Assessment’ at the Dept. of English, University of Vienna, the use of readability formulas as methods for assessing the readability level of teaching materials is actively promoted (Platzer 2015).

The FRE was proposed by Rudolf Flesch, whose readability formula relies on the aspects of word length (wl) as well as sentence length (sl) (Flesch 1948: 225): “ $RE = 206.835 - .846 \text{ wl} - 1.015 \text{ sl}$ ”⁵. RE represents “reading ease” (Flesch 1948: 225). The word length is calculated by counting the number of syllables and dividing it by the total number of words. Similarly, the sentence length is reckoned by dividing the total number of words by the number of sentences in a given text (Flesch 1948: 228-229). The calculated FRE score can range between 0 and 100, with 0 classifying a text as “practically unreadable” (Flesch 1948: 229), whereas a score of 100 refers to a text being “easy for any literate person” (Flesch 1948: 229). Put differently, the higher the score, the higher the readability of a text. This pattern is illustrated in Figure 7.

“Reading Ease” Score	Description of Style	Typical Magazine	Syllables per 100 Words	Average Sentence Length in Words
0 to 30	Very difficult	Scientific	192 or more	29 or more
30 to 50	Difficult	Academic	167	25
50 to 60	Fairly difficult	Quality	155	21
60 to 70	Standard	Digests	147	17
70 to 80	Fairly easy	Shck-fiction	139	14
80 to 90	Easy	Pulp-fiction	131	11
90 to 100	Very easy	Comics	123 or less	8 or less

Figure 7: The range of Reading Ease Scores (Flesch 1948: 230)

While the FRE serves as a means for measuring the readability of a text by particularly considering the textual structure, the Flesch-Kincaid-Grade-Level (FK) goes one step further and aims at assigning the Flesch score to a specific grade level, following the U.S. system of academic years. Based on the FRE formula and its concepts of word length and sentence length, the FK formula reads as follows: “ $GL = .39 (\text{Average Sentence Length}) + 11.8 (\text{Syllables/Word}) - 15.59$ ” (Kincaid et al. 1975: 40). GL stands for grade level. The average sentence length is calculated similarly to the FRE, namely total words divided by total number of sentences. Likewise, the word length is calculated: Number of syllables divided by the number of words.

In more detail, the FK expresses the correlation of the analyzed text with the respective American grade level that usually features such texts. Hence, a text that receives an FK score

⁵ For detailed information on the constants in the FRE formula, interested readers are referred to Flesch (1948).

of 4 is comparable to texts usually used at elementary schools. A score between 9 and 10, however, means that a text significantly features the characteristics of other texts found in the classroom of 14- to 15-year-olds. This is the case with the horticultural teaching material “Worms at Work” that, as illustrated by the yellow dot, depicts an FK of 9.30. The following figure shows the interplay between the U.S. grade level system and the students’ ages.

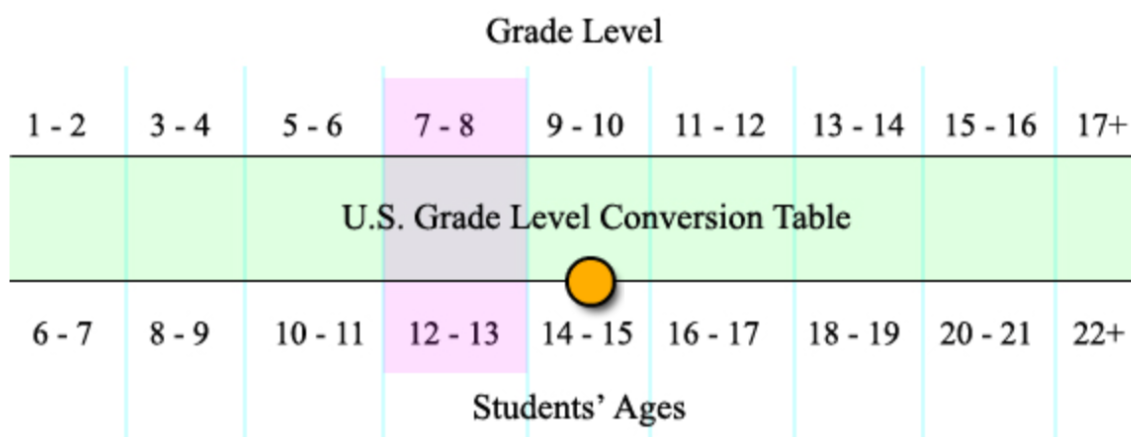


Figure 8: U.S. grade levels and their respective students’ ages (Scott 2016)

As Figure 8 shows, grade 9, for instance, corresponds to the age of 14, which is also applicable to the Austrian school system in which fourteen-year-olds usually enter their ninth academic year. Hence, the FK scores can be applied to Austrian students as well if the fact of non-nativeness is considered. The FK is based on the learning process of English native speakers, nonetheless it seems to be an effective method for measuring the appropriateness of teaching material for a certain age group of EFL learners. As an example, teaching material that is scored with an FK of 10 and thus usually found in the tenth grade in an American school setting might be employed in the eleventh or twelfth grade in Austria or might be adapted for the Austrian tenth grade.

The FRE and FK readability calculations will be done with the Flesh application available at <http://flesh.sourceforge.net> (see ch. 6.1., p. 64).

The distribution of general, academic, and technical words will be calculated by the use of the vocab profiler on www.lex tutor.ca, which has already been introduced in 3.4. (p. 40). Measuring the degree of both high and low frequency vocabulary, Lextutor is “excellent” (Schmitt 2016) with regard to determining the vocabulary profile of a given text. In particular,

the amount of “off types” (Cobb 2016), which includes the various technical words, offers valuable insights into words that might contribute to a text’s difficulty level.

5.2. Analysis procedure for classroom transcripts

In a first step six transcripts of the taped ENFS lessons were produced and entitled HBLFA_a to HBLFA_f (HBLFA = Höhere Bundeslehr- und Forschungsanstalt). The transcription conventions can be found in Appendix 3. After that, all six files were coded with the qualitative data analysis software Atlas.ti (Version 1.0.35).

In general, the units of analysis, i.e. the “the level at which data are used to represent one data point in an analysis” (Silverman & Solomon 1998: 272) are vocabulary explanations that could be identified on the basis of the HBLFA-transcripts. In this thesis, the term ‘vocabulary explanation’ is defined as follows:

[A]n utterance or a series of utterances by the teacher, or an exchange of utterances between the teacher and students, which deals with any explanation concerning a vocabulary item (any word, idiom, phrase, or expression) (Xie 2013: 437).

Using the above definition allows for capturing both the precise interactive behavior that signals different stages in a “series [...] or an exchange of utterances” and “the actual use of language in concrete situations”, i.e. the linguistic “performance” (Chomsky 1965: 4). As regards the potentially occurring serial structure of vocabulary explanations, Xie uses the term “VE sequences” (2013: 437), with VE standing for ‘vocabulary explanation’. This emphasis on succeeding utterances constituting one vocabulary explanation already hints at the major structure of VEs identified in the HBLFA-transcripts. Concerning the linguistic performance, Xie’s rather broad definition above facilitates the identification of various foci of vocabulary explanations. Hence, VEs that concentrate on spelling or pronunciation (form) or on collocations or grammatical functions (use) are included as well as the sizeable portion of explanations focusing on semantic meaning. In this way, the entire set of word knowledge as defined by Nation (2001: 27) and the way of teaching it is considered in the analysis. In sum, the above definition of ‘vocabulary explanation’ in this thesis has particularly been chosen due to the fact of the researcher remaining open-minded when analyzing the transcripts. Such an analytical impartiality allows for identifying manifold instances of vocabulary explanations, which is essential for the aim of providing an in-depth description of the vocabulary teaching methods in the classroom discourse at hand.

Although the broadly defined focus on vocabulary explanations proves to be effective, a valid documentation of such explanations has to be guaranteed with each VE instance being identified. Therefore, two specific codes are used that serve as (a) a clear marker for the starting point of each vocabulary explanation and (b) as a stringent indicator for highlighting the end of each explanation. The code ‘set in focus’ (SIF) signals the beginning of a vocabulary explanation and is often implemented by repeating the respective vocabulary item or a question triggering a teacher-student-dialogue. ‘Closing’ (CLO), on the other hand, highlights the end of an explanation, e.g. via summarizing or providing another repetition. Both of these codes rely on Waring et al. (2013), who observed such introductory and concluding behavior on the part of the teacher in videotaped ESL classroom discourse with regard to managing vocabulary explanations. Although setting a word in focus and closing the explanation seem to be typical instances with regard to explaining new words, it must be stated that a clear beginning or an explicit conclusion is not present in each and every vocabulary explanation.

With regard to coding different types of vocabulary explanations, the following coding system was developed (based on the results of Waring et al. (2013)) (see Figure 9).

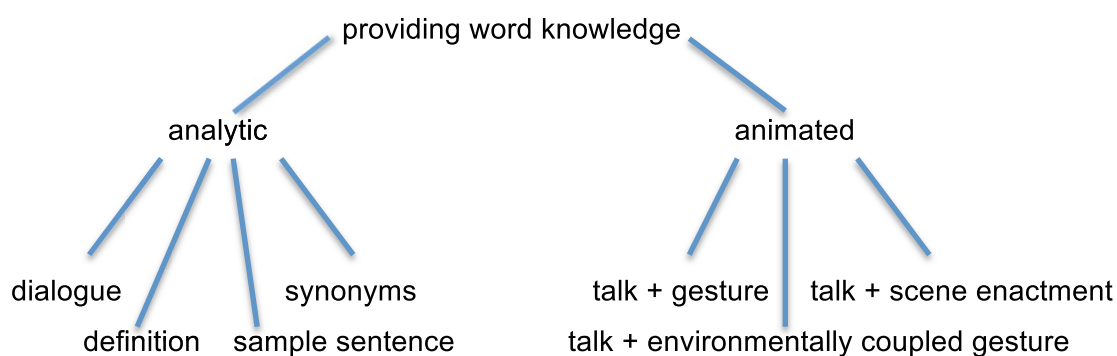


Figure 9: Types of vocabulary explanations (Waring et al. 2013)

As Figure 9 illustrates, the overall aim of providing learners with word knowledge, i.e. with information on form, meaning, or the use of a word (Nation 2001: 27), can be realized in manifold ways. The two basic strategies of contextualizing new terms via talk (analytic strategies) or via “performative measures” (animated strategies) (Waring et al. 2013: 262) served as the points of departure for a deductive coding process. In particular, the following codes were determined beforehand:

DIA explanations that explicitly encourage learners to engage in a *dialogue* guessing the meaning of a word

- DEF explanations that feature an explicit *definition* of a word
- SEN explanations that include a *sample sentence* featuring the new word
- SYN explanations that provide *synonyms* of a word

While the above codes subsume analytic approaches of vocabulary explanations, the following codes represent animated methods:

- GES verbal explanations that are accompanied by a specific *gesture*
- ECG verbal explanations in combination with gestures that include the specific classroom situation around (*environmentally coupled gesture*)
- SCE verbal explanations taking the form of a short and spontaneous “lively demonstration” (Waring et al. 2013: 261) that is close to a role-play performed by the teacher (*scene enactment*)

During the coding process, one additional code was created, namely DBB. This inductive code stands for ‘drawing on blackboard’ and describes vocabulary explanations that are supported by illustrations of processes or objects on the board.

The following extract illustrates the coding procedure. This particular example represents one vocabulary explanation that is led by the teacher, but due to its dialogic approach (“What does this mean?”) the actual explanation is given in collaboration between the teacher and the students Sm16 and Sf5, i.e. in a “series of utterances” (Xie 2013: 437). The highlighted parts illustrate the assigned codes.

- T It says <QUOTATIVE> During our rural past </QUOTATIVE> Rural. What does this mean?
- Sf17 <GERMAN> jetzige Zeit vielleicht? </GERMAN>
- Ss no
- T mhm, but it’s a good guess.
- Sm16 <GERMAN> Es ist ländlich. Das Gegenteil von Ballungsraum.
- T Ja. </GERMAN> What would be another way of saying rural in English. Give me another word for rural.
- Sf12 <GERMAN> Was heißt es auf Deutsch?
- T ländlich. </GERMAN>
- Sf5 countryside?
- T mhm?
- Sf5 countryside?
- T In the countryside. Very good. In the countryside. So, rural is another way, a very educated way of saying in the countryside.

(orange = SIF, green = DIA, red = SYN, blue = CLO)

The orange color highlights the beginning of the vocabulary explanation ('set in focus'). DIA, the green part, signals a dialogic approach that focuses on the translation of "rural". Next, the dialogue is enhanced by concentrating on synonyms (SYN). Finally, the teacher praises the student Sf5 and does not only repeat the item "rural", but also emphasizes its stylistic potential. In this way, the vocabulary explanation is closed (CLO).

Based on the aforementioned codes, all six lesson transcripts were analyzed like in the example above. The various instances of individual codes and their mutual interplay are the focus of chapter 6.2 (p. 75).

6. Data analyses and results

This chapter presents the analyses of ENFS teaching materials and vocabulary explanations found in the lesson transcripts. While the results of the reading texts are especially summarized in four graphs (see Figure 10, p. 67; Figure 11, p. 68; Figure 12, p. 74; Figure 13, p. 75), an overview of the findings with regard to vocabulary explanations is provided in both Table 20 (p. 76) and Table 21 (p. 96).

6.1. Readability and vocabulary of ENFS teaching materials

In what follows, the degree of readability of four selected teaching material (see Appendix 2) is presented. The results, i.e. FRE and FK, are explained in more detail directly after each table and thus they illustrate insights into a text's structure and its potential value for the horticultural English classroom. After that, the calculations of www.lex tutor.ca provide information on the types of words that occur in these teaching materials.

6.1.1. Readability of “Worms at Work”

Table 5: Readability of “Worms at Work”

Flesch-Reading-Ease	64.74
Flesch-Kincaid-Grade-Level	9.30
Words	1.470
Sentences	72
Syllables	2.109
Average Syllables per Word	1.43
Average Words per Sentence	20.42

According to Table 5, the teaching material “Worms at Work” exhibits an FRE of 64.74, which means that the text and its style is classified as “[s]tandard” with regard to the reading ease (Flesch 1948: 230). This medium level of difficulty is also reflected in the FK score of 9.30 that judges this particular reading text as being appropriate for U.S. students aged 14 to 15, i.e. high school students that represent the intermediate stage between elementary school children and university students. At the College for Horticulture and Landscape Design in Vienna “Worms at Work” is taught to 16- to 17-year-olds (11th grade). Such a focus on an elder group seems to be advisable due to the EFL setting.

6.1.2. Readability of “Redwood Trees”

Table 6: Readability of “Redwood Trees”

Flesch-Reading-Ease	52.74
Flesch-Kincaid-Grade-Level	10.21
Words	797
Sentences	46
Syllables	1.286
Average Syllables per Word	1.61
Average Words per Sentence	17.33

Following Table 6, the text “Redwood Trees” displays an FRE of 52.74 and hence it is labeled as a “[f]airly difficult” text, being close to the “[d]ifficult” realm that is marked by a score of 50 or lower (Flesch 1948: 230). The FK score is 10.21, thus this reading text is comparable to grade 10-teaching material in the United States. In ENFS lessons at the College for Horticulture and Landscape Design this text is used with pupils of the 11th grade, meaning that the Austrian students encounter “Redwood Trees” only one year later than their American colleagues would do.

6.1.3. Readability of “Plants of the Sequoia National Park”

Table 7: Readability of “Plants of the Sequoia National Park”

Flesch-Reading-Ease	39.47
Flesch-Kincaid-Grade-Level	13.53
Words	698
Sentences	30
Syllables	1.186
Average Syllables per Word	1.70
Average Words per Sentence	23.27

As Table 7 shows, “Plants of the Sequoia National Park” displays an FRE of 39.47. Hence, this reading text is “[d]ifficult” (Flesch 1948: 230). Furthermore, the FK score is 13.53. This challenging teaching material is used at the College for Horticulture and Landscape Design in Vienna with pupils in the 11th grade, i.e. two years before an American classroom is recommended to do so. Due to the students’ extensive horticultural content knowledge the use of this reading text at this stage appears to be appropriate. Nevertheless, it seems plausible that the teaching of this text is accompanied by a video dealing with the history, climate, and many more of the Sequoia National Park. In this way, and with particular support provided by the ENFS-teacher, the students work through the text (Weber 2016, personal communication).

6.1.4. Readability of “Herbs”

Table 8: Readability of “Herbs”

Flesch-Reading-Ease	43.02
Flesch-Kincaid-Grade-Level	13.04
Words	954
Sentences	41
Syllables	1.581
Average Syllables per Word	1.66
Average Words per Sentence	23.27

Table 8 illustrates the demanding characteristic of “Herbs”. Just as the teaching material “Plants of the Sequoia National Park”, “Herbs” belongs to the “[d]ifficult” realm with an FRE of 43.02 (Flesch 1948: 230). The FK score is 13.04 and thus additional pre- and while-reading activities are needed in order to deal with the text successfully in the 11th grade. While a video serves this purposes with the aforementioned teaching material, individual research projects on professional definitions of the term ‘herb’ should enable the students to understand the definitions given in this reading text (Weber 2016, personal communication).

All four examples of teaching materials and their respective FRE are summarized in descending order in the following table and in Figure 10 on the following page.

Table 9: The FRE of each teaching material

	Worms	Redwoods	Herbs	National Park
FRE	64.74	52.74	43.02	39.47

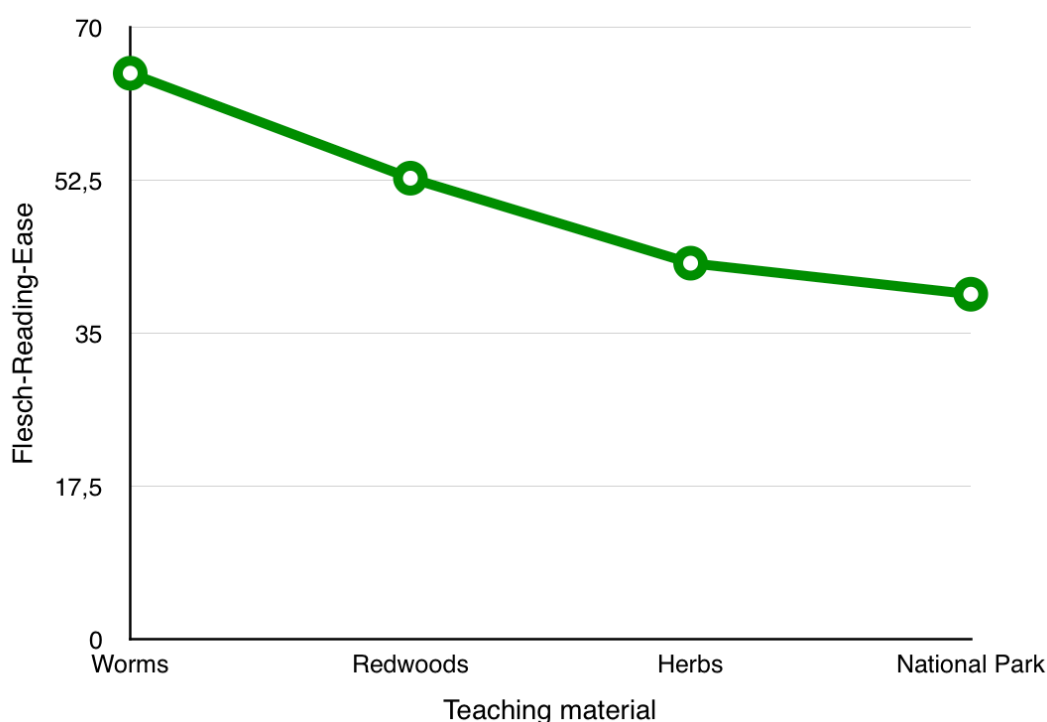


Figure 10: Comparison of the FRE in teaching materials

As Figure 10 illustrates, the teaching material “Worms at Work” clearly displays the easiest readability level when being compared to the other three texts. “Redwood Trees” is more challenging to read. It exhibits an FRE that is typical of quality magazines, which, however, are by tendency still easier to read than academic journals (Flesch 1948: 230). The teaching materials “Herbs” and “Plants of the Sequoia National Park” distinctly belong to the academic realm proposed by Flesch (1948: 230) and thus they are clearly the most demanding reading texts compared to the other two. In sum, these four examples of horticultural teaching material offer a gradual path for introducing ESP students to more specific texts and therefore professional topics.

While the readability levels of the four reading texts continually decline, the assigned grade levels are naturally on the rise. This significant increase is demonstrated in the following table and figure.

Table 10: The FK score of each teaching material

	Worms	Redwoods	Herbs	National Park
FK score	9.30	10.21	13.04	13.53

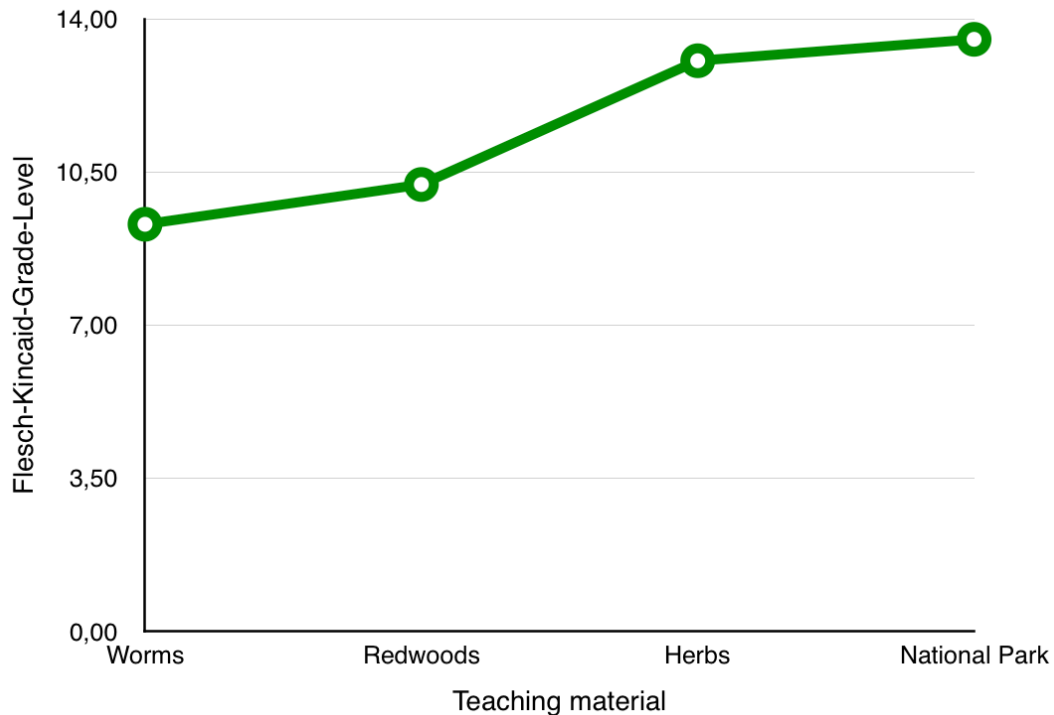


Figure 11: Comparison of the FK score in teaching materials

Following Figure 11, “Worms at Work” and “Redwood Trees” are typical texts for the ninth and the tenth grade. That is, fourteen- to fifteen-year-old American pupils should successfully deal with these texts and thus sixteen- to eighteen-year old Austrian English learners might do so as well, particularly in an instructed language classroom. The teaching materials “Herbs” and “Plants of the Sequoia National Park” are substantially more difficult to read as expressed by the high grade level of 13. Given this sharp jump in the above graph, it seems, at first glance, advisable to teach “Herbs” and “Plants at the Sequoia National Park” at a later stage in the 11th grade at the College for Horticulture and Landscape Design or even to postpone it to the 12th grade. Instead, different texts with an FK score of 11 or 12 could serve as effective teaching materials in order to prepare students for the thirteenth-level texts. More on the use of these teaching materials is discussed in 7.1.

Having presented the readability of each teaching material, the following Lextutor-calculations shed light on the amount of specific word types in the reading texts at hand.

6.1.5. Lexical technicality of “Worms at Work”

Table 11: Analysis of “Worms at Work” with regard to www.lextutor.ca

Type list	%	Cumulative
1k types	77.18	77.18
2k types	8.71	85.89
AWL types	3.17	89.06
Off types	10.94	100.00

Table 11 shows the great proportion (85.89 %) of first and second thousand levels words of English, i.e. general English words. While academic words are present to a lesser extent (3.17 %), 10.94 % of the words of “Worms at Work” belong to the “offlist” (Cobb 2016). These words belong to “any of the other levels” (Cobb 2010: 183) and thus many of them are used less frequently. Consequently, specialized items and specific language can be identified in the offlist (see Table 12).

Table 12: Set of off types identified in “Worms at Work”

Off types [quantity]
absorb_[1] acidic_[2] alarming_[1] backyard_[1] balcony_[1] batch_[3] bin_[26] bins_[5] boon_[1] branded_[1] brandling_[1] breed_[1] calcified_[1] cardboard_[1] chop_[1] citrus_[1] cm_[1] colonised_[1] comer_[1] compost_[19] compostable_[1] composting_[2] consigned_[1] continually_[1] decompose_[1] decomposed_[1] diet_[1] drainage_[2] drained_[1] drill_[1] dustbin_[2] effortlessly_[1] flock_[1] foetida_[1] fulfil_[1] gauge_[1] gravel_[2] hens_[2] herd_[1] hoover_[1] households_[1] houseplants_[1] installed_[1] internet_[2] kg_[1] kit_[1] landfill_[1] ln_[1] manure_[1] mess_[1] methane_[1] micro_[1] moist_[2] moistened_[1] moisture_[2] mould_[1] number_[1] odour_[2] organic_[1] organisms_[1] overfeeding_[1] peel_[1] pesticides_[1] planks_[1] rectify_[1] recycling_[1] redress_[1] restart_[1] routine_[1] rural_[1] scoop_[1] scraps_[7] scrunched_[1] seaweed_[1] shed_[1] shredded_[3] siphon_[1] sitter_[1] squeezed_[1] squirm_[1] starter_[1] stinking_[1] sump_[1] temptation_[1] tiger_[1] trowel_[1] tucked_[1] uncooked_[1] undesirables_[1] undisturbed_[1] vacuum_[1] vegetable_[3] waterlogged_[1]

According to Table 12, the off types of “Worms at Work” feature many words of the semantic field DIY such as “drainage”, “drill”, “gauge”, “gravel”, “hoover”, “houseplants”, “installed”, “planks”, “shed”, “siphon”, or “trowel”. Another considerable semantic field identifiable here is agriculture/horticulture: “backyard”, “calcified”, “citrus”, “compost”, “compostable”, “composting”, “decompose”, “hens”, “herd”, “methane”, “moisture”, “organic”, “organisms”, “overfeeding”, “peel”, “pesticides”, “recycling”, “rural” “scraps”, “seaweed”, “sump”, or “vegetable”. All in all, the off types of “Worms at Work” show clear reference to gardening, but due to its focus on DIY and the intended audience of home improvers and laypeople, the overall text remains more on an elementary level as regards horticulture. Both the

professional facet and lexical technicality significantly increase in the subsequent examples of horticultural teaching material.

6.1.6. Lexical technicality of “Redwood Trees”

Table 13: Analysis of “Redwood Trees” with regard to www.lextutor.ca

Type list	%	Cumulative
1k types	74.47	74.47
2k types	6.57	81.04
AWL types	4.71	85.75
Off types	14.25	100.00

Following Table 13, the teaching material “Redwood Trees” exhibits a greater proportion of off types than “Worms at Work” with reaching a score of 14.25 %. Accordingly, the amount of first and second thousands levels words is slightly reduced, resulting in 81.04 %.

Table 14: Set of off types identified in “Redwood Trees”

Off types [quantity]
abound_[1] arouse_[1] array_[1] assimilation_[1] atmosphere_[1] bark_[1] basal_[1] biotic_[1] blackberry_[1] brilliantly_[1] burls_[1] bygone_[1] climate_[1] clone_[1] coastal_[1] continually_[1] dazzling_[1] diffusion_[1] dinosaurs_[1] dormant_[1] downed_[1] drips_[1] droughts_[1] elevation_[1] elusive_[1] endurance_[1] envision_[1] eras_[1] evergreen_[1] fantastic_[1] ferns_[1] firs_[1] foliage_[2] fossil_[1] fungi_[1] greenery_[2] growths_[1] height_[1] hemlocks_[1] huckleberry_[1] humility_[1] inhabitants_[1] inkling_[1] inland_[1] knotty_[1] logging_[2] longitude_[1] madrones_[1] massive_[1] moist_[1] moistening_[1] moisture_[2] molecular_[1] mosses_[1] mushrooms_[1] nutrients_[2] precipitates_[1] rainfall_[1] recycles_[1] recycling_[1] redwoods_[14] regenerate_[2] rhododendron_[1] rhododendrons_[1] rumbling_[1] salmonberry_[1] sapwood_[1] seasonal_[1] seedlings_[1] sempervirens_[1] sequoia_[1] shrink_[1] shrubs_[1] skyscraper_[1] sorrels_[1] species_[1] spectacular_[1] springtime_[1] sprout_[1] sprouts_[1] stately_[1] stump_[1] tannin_[1] tanoaks_[1] taproot_[1] thimbleberry_[1] thrive_[1] thrived_[1] tomato_[1] toned_[1] toppling_[1] transpiration_[1] transpires_[1] verdant_[1] vital_[1] windthrow_[1]

Table 14 illustrates the offlist of “Redwood Trees”. A good proportion refers to plant names, e.g. “blackberry”, “ferns”, “firs”, “hemlocks”, “huckleberry”, “madrones”, “redwoods”, “rhododendron”, “salmonberry”, or “tanoaks”. Furthermore, a noticeable amount of words are technical terms deriving from botany, e.g. “bark”, “burls”, “evergreen”, “foliage”, “fungi”, “greenery”, “mosses”, “nutrients”, “shrubs”, “species”, “sprouts”, “stump”, “tannin”, “taproot”, or “transpiration”. Some words come from biology such as “biotic” or “clone”, while others stem from forestry, e.g. “logging” and “windthrow”, or from climatology, e.g. “atmosphere”, “climate”, and “coastal”. In summary, basic technical terms from various specific disciplines are omnipresent in this teaching material.

6.1.7. Lexical technicality of “Plants of the Sequoia National Park”

Table 15: Analysis of “Plants of the Sequoia National Park” with regard to www.lex tutor.ca

Type list	%	Cumulative
1k types	69.61	69.61
2k types	6.63	76.24
AWL types	4.97	81.21
Off types	18.78	100.00

As shown in Table 15, “Plants of the Sequoia National Park” only features 76.24 % of first and second thousand levels words, resulting in the significant amount of 18.78 % when it comes to off types. As regards the degree of academic words, 4.97 % of all words stem from the Academic Word List, which is the largest amount of academic words found in the four examples of teaching materials. Here, words like “accumulation”, “annual”, “communities”, “component”, “create”, “define”, “focus”, “impacts”, “monitoring”, “persist”, “primarily”, “restoring”, or “unique” are included. The structure of the offlist is illustrated in the following table.

Table 16: Set of off types identified in “Plants of the Sequoia National Park”

Off types_[quantity]
alpine_[4] amalgam_[1] assemblage_[1] benches_[1] canopy_[1] cedars_[1] chaparral_[3] climates_[1] cloak_[1] coexist_[1] cone_[1] conifer_[1] coniferous_[2] dense_[2] desiccating_[1] downed_[1] drier_[1] drought_[1] dryland_[1] ecosystems_[1] elevation_[1] elevations_[2] evergreen_[1] exotic_[1] fir_[2] firs_[1] flora_[2] foothill_[2] foothills_[1] foxtail_[2] giant_[2] gnarled_[1] gradient_[1] grassland_[1] groves_[1] habitat_[1] habitats_[2] hardest_[1] harsh_[1] heights_[1] herbaceous_[1] herbs_[3] hugging_[1] hummocks_[1] insulation_[1] intact_[1] intermix_[1] invasive_[1] landscape_[1] landscapes_[1] leaved_[1] lowland_[1] lowlands_[2] mammals_[1] massive_[1] meadows_[3] mirrors_[1] moist_[1] montane_[2] mosaic_[1] naturalized_[1] non_[2] oaks_[1] perennial_[1] pine_[2] pines_[3] precipitation_[1] recreational_[1] renowned_[1] ridges_[1] saturated_[1] sclerophyllous_[1] sedges_[1] sequoias_[1] showy_[1] shrubs_[1] snowpack_[1] snowstorms_[1] southernmost_[1] species_[6] spectacular_[1] stark_[1] steineichenwald_[1] stunted_[1] sub_[1] subalpine_[2] thickets_[1] thrive_[1] tolerant_[1] topographic_[2] tracts_[1] tremendous_[1] understory_[1] vast_[1] vegetation_[3] wetter_[1] wildflowers_[2] woodlands_[2] zones_[1]

Following Table 16, three major disciplines can be identified, namely botany, forestry, and geography. Within the area of botany, the lexical items can be classified as basic botanical terms such as “evergreen”, “flora”, “habitat”, “herbs”, “shrubs”, “species”, “vegetation”, and “wildflowers”. Furthermore, some botanical terms describe distinct characteristics of plants, e.g. “coniferous” (a tree producing cones), “herbaceous” (the opposite of lignifying plants), “perennial” (a plant living for more than two years), and “sclerophyllous” (plants with leathery and evergreen leaves). Finally, plant names like “cedars”, “foxtail”, “fir”, “oaks”,

“sedges”, and “sequoias” also belong to the field of botany. With regard to the field of forestry, “canopy”, “chaparral”, “understory”, and “woodlands” are typical technical terms. The third group, geography, is represented by words like “alpine”, “dryland”, “foothills”, “lowlands”, “montane”, “precipitation”, “ridges”, “subalpine”, “topographic”, or “tracts”. In short, the text “Plants of the Sequoia National Park” does not only offer a wide spectrum of scientific vocabulary from different areas of expertise, but also provides a fine-tuned representation of botanic fundamentals, vegetal attributes, and botanic taxonomical insights.

6.1.8. Lexical technicality of “Herbs”

Table 17: Analysis of “Herbs” with regard to www.lextutor.ca

Type list	%	Cumulative
1k types	69.00	69.00
2k types	10.13	79.13
AWL types	4.38	83.51
Off types	16.49	100.00

Table 17 shows the good proportion of off types (16.49 %), while the first and second thousand levels words add up to 79.13 %. Similarly to the previously analyzed teaching material, the offlist of “Herbs” includes a noticeable range of lexical technicality (see Table 18).

Table 18: Set of off types identified in “Herbs”

Off types [quantity]
accessories_[1] airy_[1] alkanet_[1] angelica_[1] appealing_[1] aromatic_[3] basil_[1] bees_[1] bergamot_[1] biennial_[1] botanical_[1] bottomless_[1] brilliant_[1] catmint_[1] chives_[2] climate_[1] coltsfoot_[1] coriander_[1] cosmetic_[1] courtyards_[1] culinary_[1] cultivars_[1] cuttings_[1] dandelion_[1] decorative_[3] dill_[1] discredited_[1] dyeing_[1] elaborate_[1] extremes_[1] fennel_[1] flax_[1] foliage_[1] fragrance_[1] gardening_[1] gentler_[1] germander_[1] hardy_[1] hedges_[1] herb_[9] herbaceous_[1] herbs_[22] hyssop_[1] ingenious_[1] invasive_[1] juniper_[1] lavender_[2] lemon_[1] lily_[1] lovage_[1] magnificence_[1] marigolds_[1] marjoram_[2] mauve_[1] medicinal_[4] merit_[1] mingle_[1] mint_[1] mints_[1] mock_[1] moist_[1] mulleins_[1] nasturtiums_[1] parsley_[3] patios_[1] peak_[1] pennyroyal_[1] perennial_[2] perennials_[1] perfumes_[1] plunged_[1] propagated_[1] pruning_[2] relegated_[1] replanting_[1] revived_[1] rhubarb_[1] robust_[1] rosemary_[1] roses_[1] rotation_[1] sage_[3] satisfyingly_[1] savoury_[1] segregated_[1] shapely_[1] shrubs_[3] species_[2] stately_[1] strewing_[1] subdued_[1] superseded_[1] symmetrical_[1] tangible_[1] therapeutic_[1] thrive_[1] thyme_[3] variegated_[2] vegetable_[1] vegetables_[1] vegetatively_[1] verbenas_[1] vigorous_[2] violets_[1] wholesale_[1] wildflowers_[1]

According to Table 18, the reading text “Herbs” features a variety of terms that can be related to horticulture. In particular, five categories can be identified. The largest group includes plant

names, e.g. “alkanet”, “angelica”, “basil”, “bergamot”, “catmint”, “chives”, “coltsfoot”, “coriander”, “dandelion”, “fennel”, “flax”, “germander”, “hyssop”, “juniper”, “lavender”, “lovage”, “marigolds”, “marjoram”, “mulleins”, “nasturtiums”, “pennyroyal”, “rhubarb”, “rosemary”, “sage”, “thyme”, “verbena”, or “violets”. Secondly, generic horticultural terms can be found such as “cultivars”, “cuttings”, “propagated”, “pruning”, “replanting”, “rotation”, “species”, “vegetables”, “vegetatively” or “wildflowers”. The third group of horticultural terms refers to adjectives that describe plant growth, e.g. “biennial”, “hardy”, “invasive”, or “perennial”. The fourth category includes items related to the intrinsic properties of plants, e.g. “aromatic”, “culinary”, “medicinal”, or “savory”. Finally, the fifth group of terms subsumes adjectives referring to the exterior plant habit such as “appealing”, “decorative”, “shapely”, “stately”, “symmetrical”, or “vigorous”. All in all, the teaching material “Herbs” explicitly focuses on the horticultural discipline by encompassing the facets of plant names, fundamental technical terms, plant growth, plant traits, and plant habits.

Table 19 summarizes the degree of off types identified in the four horticultural teaching materials in ascending order. The comparison of the four offlists is illustrated in Figure 12 (p. 74).

Table 19: The degree of off types in each teaching material

	Worms	Redwoods	Herbs	National Park
Degree of off types	10.94 %	14.25 %	16.49 %	18.78 %

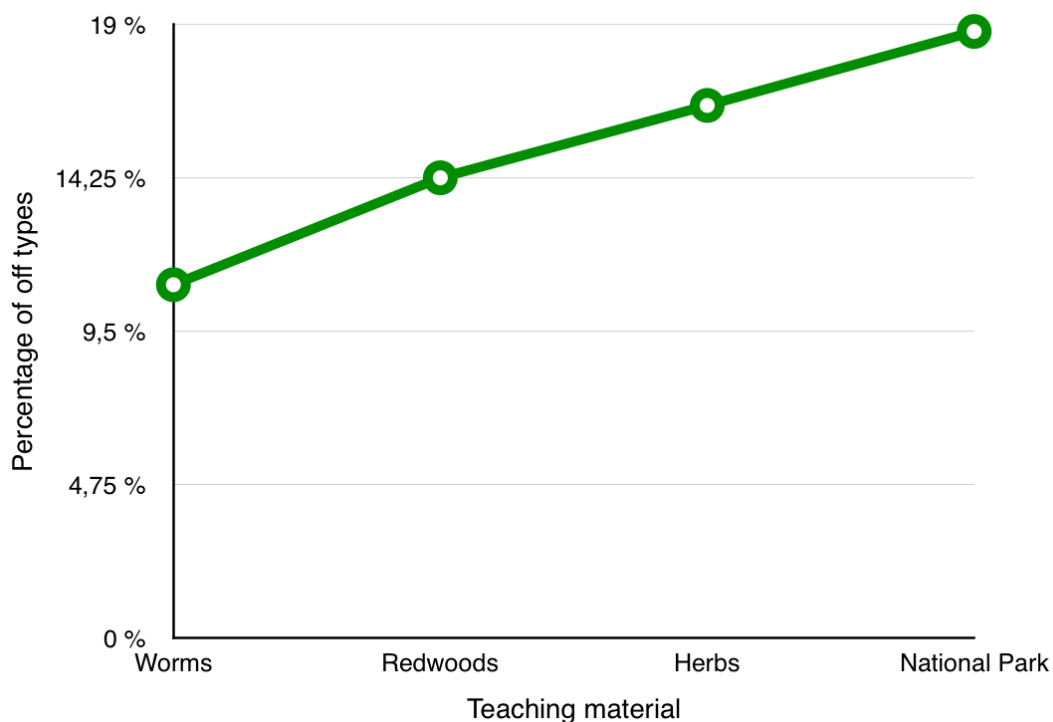


Figure 12: Comparison of the degrees of off types in teaching materials

According to Figure 12, a steady increase with regard to the amount of off types in all four teaching materials can be identified. While “Worms at Work” features nearly 11 % of off types, “Plants of the Sequoia National Park” exhibits a degree of almost 19 % when it comes to words that do not belong to the most frequent English words or to the Academic Word List. Similarly, the extent of offlist words in “Herbs” is relatively high, given the percentage of around 16 %. The teaching material “Redwood Trees” shows a degree of almost 14 %.

In general, the gradual rise from 11 % to 19 % of off types is in line with the Flesch-Kincaid-Grade-Level (see Figure 11, p. 68), which arranges the teaching materials in the same order, namely “Worms at Work” – “Redwood Trees” – “Herbs” – “Plants of the Sequoia National Park”. Put differently, the greater the extent of off types, the higher the grade level. This interrelation might lie in the fact that English off types tend to be polysyllabic items (e.g. *topographic*, *sclerophyllous*) that, due to their noticeable word length, automatically result in higher FK scores.

Since the Flesch-Reading-Ease decreases when the FK is on the rise, it is plausible that high FK scores are equivalent to low readability levels. Given the fact that high FK scores are in accordance with high degrees of off types, it can be said that the higher the amount of off types, the lower the readability level. Hence, “Plants of the Sequoia National Park” exhibits the lowest readability level due to the highest degree of off types. Although the FRE and its

resulting readability levels are primarily based on both word length and sentence length, the types of words have an apparent impact as well. This correlation of readability and offlist words is demonstrated in the following figure.

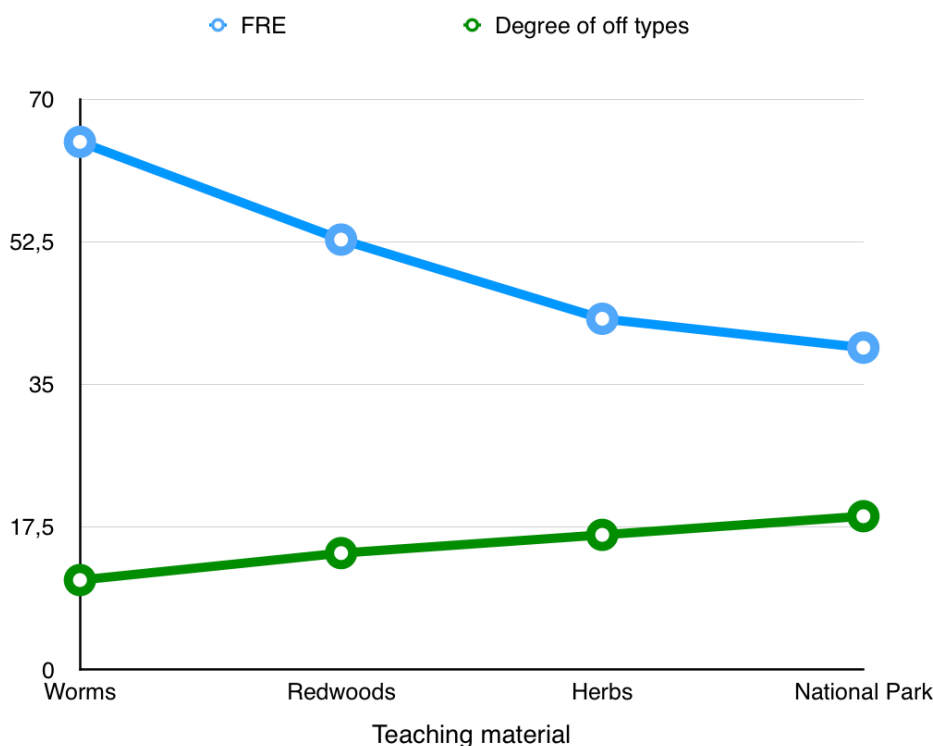


Figure 13: Correlation of FRE scores and the degrees of offlist words

Following Figure 13, a text becomes more difficult to read if the number of off types increases. As an example, “Worms at Work” has been classified as a “standard” text (Flesch 1948: 230) with an FRE of 64.74 and 10.94 % of off types. “Herbs”, however, relies on 16.49 % of words that are ‘offlisted’ and its FRE is only 43.02. Similarly, “Plants of the Sequoia National Park” features 18.78 % of off types and has been scored with a remarkably low FRE of 39.47. This link between readability and the amount of offlist words needs to be considered when planning ENFS lessons and selecting appropriate teaching material.

6.2. Vocabulary explanations in ENFS lessons

The following analysis of vocabulary explanations (VEs) in the HBLFA-transcripts is presented by listing the total number of instances with regard to each code. Then, the typical pattern of both the beginning (code: SIF) and ending (code: CLO) of VEs is explained, which is followed by detailed descriptions of analytic and animated vocabulary explanations found

in the ENFS classroom. Finally, the specific interplay of analytic and animated approaches will be investigated.

In general, the analysis of classroom discourse in this thesis yielded the following results:

Table 20: Number of instances per code

Code name	Quantity
SIF (set in focus)	78
ANALYTIC STRATEGIES	Total: 229
DEF (definition)	58
SEN (sample sentence)	17
SYN (synonyms)	24
DIA (dialogue)	130
ANIMATED STRATEGIES	Total: 19
GES (gesture)	8
ECG (environmentally coupled gesture)	5
SCE (scene enactment)	3
DBB (drawing on blackboard)	3
CLO (closing)	74
VE (vocabulary explanation)	97

As Table 20 illustrates, a substantial majority of vocabulary explanations identified in the six analyzed ENFS-lessons belongs to the analytic strategies, i.e. explanations that primarily feature talk. Only 19 instances of animated VEs could be identified. As regards the total number of vocabulary explanations, 97 “VE sequences” (Xie 2013: 437) have been categorized, which means that 97 words were explained during the recordings. Since one explanation might feature several gestures (GES), questions (DIA), sample sentences (SEN) etc., the total number of analytic and animated strategies exceeds the number of VEs. This is illustrated in the following example:

T **What is a bin? Can you show me a bin here in this room?**
Ss (pointing at the bin next to the blackboard)
T Yes, exactly. We have a bin over here. (pointing to the bin). Can you see this one?
Ss mhm
T We also have some bins at the back (pointing at the back of the room). Yeah, That's a bin
 (again pointing at the bin next to the blackboard). <GERMAN> Ja?
SfX Mistkübel.
T Genau. </GERMAN> **So, this is a bin.**
 (orange = SIF, green = DIA, gray = ECG, blue = CLO)

As the above extract demonstrates, one vocabulary explanation can feature one clear SIF, one specific CLO, but two instances of ECG. The multiple stages of one VE sequence is also illustrated in the following:

T **If something is a boon?** Somebody who wants to make an educated guess?
 Sf12 I think something nice, [something
 T [yes
 Sf12 useful,
 T Yes, true. **A boon is like a blessing.** Do you know what a blessing is? [When
 Ss [yeah
 T you go to church and the priest gives you a blessing (imitating a priest with imposing
 arms)?
 Sm10 <GERMAN> ein Segen
 T **Ja, ein boon ist ein Segen, ein wahrer Segen,**
 (orange = SIF, green = DIA, red = SYN, purple = GES, blue = CLO)

Here, the vocabulary explanation consists of two dialogic approaches, one reference to a synonym, and a statement supported by a gesture. The opening and concluding patterns of SIF and CLO are present as well. In what follows, these two codes are described in detail.

6.2.1. Setting in focus (SIF)-sequences

As regards the beginning of VEs analyzed in this thesis, manifold basic teaching strategies are identified. First and foremost, the teacher directly relies on the reading text by simply quoting from it. This is done, for instance, by quoting and repeating the specific item the teacher wants to focus on:

T **It says <QUOTATIVE> During our rural past </QUOTATIVE> Rural.** What does this mean?
 (orange = SIF, green = DIA)

Here, explicit attention is drawn towards the text by the phrase “[i]t says” and a quote following. Then, the term “rural” is separately repeated in order to adopt a dialogic approach in which the students are supposed to participate in explaining, or at least guessing, the meaning of “rural”. A similar SIF-structure is present in the following VE:

T **And they will <QUOTATIVE> fulfill the same recycling function to leave you with a source of rich compost </QUOTATIVE>.** Recycling function?
 (orange = SIF, green = DIA)

While the aforementioned example displays both a separate repetition of the particular vocabulary item and an anaphoric reference in the question “What does this mean?”, this SIF-

instance is followed by a question that aims at eliciting the meaning of “recycling function” and simultaneously serves as a repetition of the item after quoting.

Another instance of quoting in order to focus on one specific word reads as follows:

T So, in practice, they say here, it is safest to <QUOTATIVE> play it by ear </QUOTATIVE>. This is a super phrase. It's really super useful and we will come across a similar phrase in the next topic. If you play something by ear? What COULD that mean?
(orange = SIF, green = DIA)

In this example, the teacher quotes from the text and immediately provides a comment on the usefulness of the idiomatic phrase “to play it by ear”. This comment features the adjective “super” twice and furthermore stresses the fact of encountering this phrase in the near future. Thus, the item is set in focus by explicitly emphasizing the relevance of this particular phrase. Apart from that, this example displays a highly characteristic aspect when setting words in focus via quotes, namely the use of explicit deictic expressions like “they say here”. This is also demonstrated in the following two examples:

T Here they say the worms breathe through their skin. Br[i]the?
(orange = SIF, green = DIA)

T So here it says <QUOTATIVE> however </QUOTATIVE>. What is <QUOTATIVE> however </QUOTATIVE>?
(orange = SIF, green = DIA)

A further SIF-strategy is the teacher quoting from the text to illustrate which words are already known. Then, she focuses on one specific item that might be new to the students like in the following two examples:

T they say here, <QUOTATIVE> anyone can keep a flock of worms </QUOTATIVE> We know what worms are, right?
Ss yes
T What is a flock? A flock of sheep?
(orange = SIF, green = DIA)

T to produce <QUOTATIVE> a steady supply of compost </QUOTATIVE>. We know what compost is. Do we know what supply is?
(orange = SIF, green = DIA)

This above-mentioned strategy of checking already known words and the immediate subsequent focus on a new item is also clearly demonstrated in the following (without relying on a direct quotation from the reading text):

T So, they fed backyard pigs or hens. Pig is clear, hen is clear, fed is clear, so what is backyard?

(orange = SIF, green = DIA)

So far, the process of setting words in focus in order to launch a vocabulary explanation primarily features direct quotes, isolated repetitions (e.g. “Rural.”), reiteration via display questions (e.g. “What does this mean?”), explicit comments (e.g. “This is a super phrase.”), and the comparative focus on already known and new words (e.g. “We know [...] do we know?”). Further SIF-strategies include pace of speech and the use of L1.

As regards the speaking tempo, the teacher especially slows down her voice in order to highlight the word that should be set in focus. This is illustrated in the following:

T and we will check on the <SLOW> bin's progress </SLOW>. <GERMAN> Was ist denn der progress?

(orange = SIF, green = DIA)

Occasionally, the teacher does not only slow down her speech, but also stresses a word by speaking up, as demonstrated in the next example:

T And what is leafMOULD?

(orange = SIF)

Another way of setting a word in focus is using L1, i.e. German. This is done for a general shift towards vocabulary explanations like in this extract:

T <GERMAN> Ja, schau ma uns die Vokabel kurz miteinander an </GERMAN>. So if you NEITHER have the space NOR, neither nor.

(orange = SIF)

Furthermore, the L1 is used for stressing stylistic aspects of a word when setting it in focus, as demonstrated in the two following examples:

T <GERMAN> Und dustbin ist ganz ein britisches Wort. Was ist denn dust eigentlich?

(orange = SIF, green = DIA)

T And these pigs and hens what did they do? Here, this is a very nice word, they <QUOTATIVE> converted the food into manure </QUOTATIVE>. <GERMAN> Das ist eine sehr gewählte Ausdrucksweise </GERMAN>. What do you think?

(orange = SIF, green = DIA)

All in all, it can be seen that the instances of SIF mainly rely on direct quotes taken from the teaching material and the repetition of single words after quoting. This basic strategy is supported by the method of comparing known to unknown words, the reduction in the pace of speech, the increase in volume, and the occasional use of L1.

6.2.2. Closing (CLO)-sequences

Similarly to setting words in focus, the ending of VEs frequently includes repetitions of the individual item. Furthermore, a brief summary via short definitions or feedback to a student's participation mark the end of a VE. The structure of CLO-instances is characterized in detail as follows:

One of the basic teaching techniques for closing a VE is using the marker “So”, which can either result in a simple summarizing statement or in a regulative announcement. The first instance is illustrated in the following examples:

SfX Mistkübel.
T Genau. </GERMAN> So, this is a bin.
(blue = CLO)

T What is the opposite of speaking quietly?
Ss loud
T The opposite is speaking loud, exactly, right. So they are quiet, they don't talk, right?
(blue = CLO)

T They multiply is a nice way to say that they propagate and have sex and have baby worms,
Sf4 baby worms
T right? Right? (1) So, they will soon multiply, they will soon propagate, there will soon be more worms,
(blue = CLO)

As regards directives announced during the closing of a VE, they often require the students to note something down, as shown in the following:

T Kennt's ihr sicher von Internetprovider, [was
Ss [ja
T macht der? Der bietet euch das Internet an. Gegen Geld natürlich. Ja? So, das könnt ihr euch aufschreiben, to provide, anbieten
(blue = CLO)

Apart from introducing the concluding statement with “So”, all endings of the above VEs include the respective item that was set in focus at the beginning of each VE, namely “bin”, “quiet”, “multiply”, and “provide”. This is a typical characteristic of VEs analyzed in this thesis and can also be seen in the next CLO-strategies.

Closing a VE often aims at checking the pupils’ understanding of the meaning of a new vocabulary item, which is demonstrated in the following examples of comprehension checks:

T Manure is a kind of a fertilizer and the difference is when we talk about fertilizer we mean CHEMICAL fertilizer, right? **And manure would be ORGANIC fertilizer. Does it make sense?**

(blue = CLO)

T Grünschnitt zum Beispiel, ja. Ja **</GERMAN>**, your food leftovers or some other organic materials that you have, flowers, leaves that have fallen off, grass, that sort of things. **That’s organic matter. Makes sense?**

(blue = CLO)

T Verarbeiten, ja. Produce heißt produzieren, etwas herstellen **</GERMAN>**. Process is you have something and you turn it something else. **That’s to process. <GERMAN> Der Unterschied ist klar zwischen produce und process?**

(blue = CLO)

T Die Versuchung ist das, ja. Ja, die Versuchung, temptation. Und jemanden in Versuchung führen? Auf Englisch ist das viel kürzer als auf Deutsch. Auf Deutsch heißt das in Versuchung führen, auf Englisch **</GERMAN>** to tempt someone. **Right? To tempt someone.**

(blue = CLO)

T **They also need less care and attention. What is care?**

Sf17 **<GERMAN>** Sich um jemanden kümmern, [also

T [Mhm,

sich um jemanden kümmern, die Pflege. **Ja? Die Pflege, sich um jemanden kümmern. to care. Denks an carefree. Ja? Ja? Pflegeleicht. Ja? </GERMAN>**

(orange = SIF, green = DIA, blue = CLO)

From time to time the evaluative purpose of comprehension checks results in a negative response from the students. If so, the teacher has to offer an alternative explanation like in the following example in which the dialogic approach suddenly turns into an explicit teacher-led definitional statement:

T And what is <QUOTATIVE> efficient </QUOTATIVE>? If something is efficient
 <GERMAN> sag ma auf Deutsch auch das ist effizient. Aber was heißt denn das
 eigentlich, wenn etwas effizient ist?

Sm10 Auf Deutsch? </GERMAN>

T Give me English if you can.

Sm10 So, efficient is when something is very (2) good. For example the worm compost, (1)

T It's hard. It's not an easy question. It's hard to explain, right?

Ss mhm

T What would you say? In German or in English. efficient, <GERMAN> effizient
 </GERMAN>.

Sf5 Ahm, I think that is something that works good without a lot of work.

T Ja, I think that's pretty good. Did you get this?

SmX No.

T If something works really well without putting a lot of work into it.
 (orange = SIF, green = DIA, blue = CLO)

In order to check the understanding of the new vocabulary items via the above questions “Does it make sense?”, “Der Unterschied ist klar? [The difference is clear?]”, “Right?”, or “Did you get this?” that are put to the whole class and the “Ja? [Yes?]” addressing individuals, it is only plausible that, again, the respective item of the SIF-sequence is repeated in the CLO-structure (cf. “manure”, “organic”, “process”, “to tempt someone”, “care”).

In addition to basic summarizing “So”-statements and comprehension checks, the concluding structure of VEs can also feature brief definitions delivered by the teacher that quickly restate the root of the matter (occasionally using L1). Although these closing definitions seem to be quite similar to the aforementioned “So”-structures, the definitions here lack such an explicit concluding marker and thus the pupils have to be more aware to recognize the end and therefore the take home message of the respective VE. This is exemplified by the following extracts:

T It doesn't go up and down all the time (making wavy lines with her hands), it stays the same. Then it's steady.
 (blue = CLO)

T It's the garden that's behind the house. That you don't see from the front. That's a backyard. <GERMAN> Yard ist an sich der Hof oder eine Gartenfläche. Ein </GERMAN>
 backyard is behind the house.
 (blue = CLO)

T A sump is <GERMAN> Sumpf </GERMAN>.
 (blue = CLO)

T With wooden planks. Planks are pieces of wood. <GERMAN> Holzstückerl
(blue = CLO)

T That's leafmould. That's old leaves that rot, that start to rot. Decayed leaves.
(blue = CLO)

While the above examples of closing a VE are solely led by the teacher, the following extracts mirror the interplay between the teacher and the students when it comes to clarifying the meaning of a new word. Given the fact that such dialogic approaches (DIA) are the largest group within the total amount of analytic and animated strategies (see Table 20, p. 76), the frequent use of traditional IRF exchanges and their immediate feedback taking the form of a follow-up is a natural consequence. Hence, the final, teacher-led, statement in the triadic structure of

T: "What does this mean?"

S [providing the correct answer]

T [repeating the answer] + "excellent" / "exactly" / "right" etc.

accurately represents the CLO-structure in VEs that are mainly based on DIA. These concluding evaluative statements are illustrated in the following examples:

T What would be another way of saying rural in English? Give me another word for rural.
Sf12 <GERMAN> Was heißt es auf Deutsch?
T ländlich. </GERMAN>
Sf5 countryside?
T mhm?
Sf5 countryside?
T In the countryside. Very good. In the countryside.
(green = DIA, blue = CLO)

T Mhm. What would be another word for urban area?
Sm1 city
T City, yes. Very good, ja? Very good.
(green = DIA, blue = CLO)

T Give me another way of saying convert in English. (2) super simple word.
Sm1 ah, to to change.
T to change, super, exactly. So, the food is changed, converted into manure.
(green = DIA, blue = CLO)

T What do you do when you shred?
Sm15 To cut things in little pieces.
T Exactly, we cut things in little pieces. We tear it apart, right?
(green = DIA, blue = CLO)

T <GERMAN> Was ist denn der progress?
Sm15 Fortschritt.
T Der Fortschritt. Ja </GERMAN>.
(green = DIA, blue = CLO)

In sum, closing a VE in the lessons analyzed here relies on the use of summarizing “So”-statements, comprehension checks, brief iterative definitions, and evaluative statements based on the traditional IRF-sequence.

Having described both the strategies of setting a word in focus and the techniques for closing vocabulary explanations, the following pages will focus on the detailed analysis of the core of each vocabulary explanation. First, the four methods of the analytic strategies will be presented (definition, sample sentence, synonyms, dialogue), which is then followed by the description of animated strategies (gesture, environmentally coupled gesture, scene enactment, drawing on blackboard).

6.2.3. Analytic strategies

Definition (DEF)

VEs that rely on providing a definition for a specific vocabulary item seem to pursue different aims. First of all, definitions are used in order to raise the students' awareness of how to explain certain concepts:

T Moist ist feucht </GERMAN> If you had to explain what that means (1) in English?
Sf17 A little bit of wet.
T Just a little bit. It's not the same as wet. It's dryer than wet, but it's wetter than dry.
(green = DIA, tawny = DEF)

T <GERMAN> Organische Masse? Was kann man sich unter organischer Masse vorstellen, was ist damit gemeint?

Sm7 Grünschnitt.

T Grünschnitt zum Beispiel, ja. Ja </GERMAN>, your food leftovers or some other organic materials that you have, flowers, leaves that have fallen off, grass, that sort of things.

(green = DIA, tawny = DEF)

Next, definitions are employed in order to contrast the meanings of two closely related vocabulary items:

T Also Holz und timber ist Holz, das zu irgendwas weiterverarbeitet wird. Dann ist es timber. Wenn nur irgendwo ein Holzstamm rumliegt, dann ist es wood.
(tawny = DEF)

Definitions also illustrate the various meanings of one particular word:

T Diet has two meanings. One meaning that we all know is when you try to lose weight, then you are ON a diet. But everyone of us HAS a diet. And you can have a healthy diet, an unhealthy diet, right?
(tawny = DEF, blue = CLO)

So far, the above examples of definitional strategies rather exemplify the meaning of individual items than providing a genuine definition. This changes in the following examples, in which “substitution” (Flowerdew 1992: 211) (cf. “planks”) and “formal definitions” (Flowerdew 1992: 209) (cf. “source”, “diet”) can be found. These definitions are used to provide a vocabulary explanation straight away, e.g. for time reasons:

T With wooden planks. Planks are pieces of wood.
(tawny = DEF)

T And a source, eine? (3) Was ist eine source? (1) Eine Quelle wo was herkommt ist eine source, ok?
(tawny = DEF, blue = CLO)

T Diet is not just kitchen scraps but diet is ALL the things that you eat. You can have a McDonalds diet.
(tawny = DEF)

Sample sentence (SEN)

Emphasizing the respective vocabulary item in context, sample sentences are either used to illustrate the meaning of a word after a translation has already been provided, or to support the elicitation of a certain vocabulary item in a DIA-approach. The former is demonstrated in the following examples:

Sf15 Heißt das nicht content?

T Content gibts auch, das ist zufrieden.

Sf3 Was?

T Zufrieden.

Sf3 Ok.

T Also morgen zum Beispiel könnte sein, dass ihr dann sagt </GERMAN> after the revision, I am really content with my work.

(pink = SEN)

T Moisture, <GERMAN> die Feuchtigkeit.
 Sf4 Sagt man air moisture?
 T Die Luftfeuchtigkeit, mhm. (1) Vielleicht kennt's ihr das auch von Hautcremen zum Beispiel, da steht manchmal auch drauf ahm, </GERMAN> **increases the moisture of your skin** <GERMAN> oder irgendsowas.

(pink = SEN)

Note that the above sample sentences are explicitly introduced by phrases like “dass ihr dann sagt [that you then say]” and “da steht manchmal auch drauf [there it sometimes says]” in order to underpin the exemplary character of the given sentence and thus to highlight the contextualization of a certain word.

Next, sample sentences that are meant to facilitate the guessing of specific items are presented:

T Erfordern, verlangen </GERMAN>. **Can you give me another English word for require?**
 Ss Ahm
 T **I require that you do your homework.**

Sf12 to want to

T It's more than just to want

Sf12 Ok.

Sm15 you need

T **You NEED to do your homework, ja?**

(green = DIA, pink = SEN, blue = CLO)

T To get a scoop we have the ice cream box in front of us if you remember this, **you say I want to have an ice cream with three scoops.** Then you have the ice cream box in front of you and you have the special tool, right, **and then you go and SCOOP off the top layer of your ice cream.**

Sf3 <GERMAN> [abkratzen]

Sm1 [abschaben]

T Mhm. So, herunterheben, ja? Und das bedeutet to scoop something off mit zwei f. **Etwas herunterheben, ja?** </GERMAN>

(pink = SEN, cyan = CLO)

T **If I expect you to do something, what does this mean? To expect? I expect you to do your homework alone.**

Sm10 <GERMAN> erwarten?

T **Erwarten.** </GERMAN>

(green = DIA, pink = SEN, blue = CLO)

All in all, the use of sample sentences in the analyzed lessons aims at enriching a VE that is simply based on giving a translation or providing a brief definition. In this way, the respective vocabulary item is repeated close to the end of the VE. On the contrary, a sample sentence might be used after having launched into a VE in order to provide the students with a useful

clue as to the meaning of a word, which has to be guessed by the learners. Hence, student participation might be increased.

Synonyms (SYN)

Synonyms in VEs are particularly used at the end of the explanation when it comes to repeating the respective vocabulary item. Nevertheless, there are some instances in which the focus on synonyms serves as the point of departure in dialogic approaches. First, the role of synonyms in combination with CLO-sequences is considered:

T **Do we know what supply is?**
Sm10 <GERMAN> Ertrag.
T **Ja, der Vorrat, der Ertrag.** </GERMAN>
(green = DIA, red = SYN, blue = CLO)

In the above example, the use of a synonym directly follows the closing evaluative statement (“Ja [Yes]”) in order to successfully complete the IRF-structure. In other words, mentioning the synonym and repeating the original vocabulary item represents the actual CLO-sequence. On the contrary, the following extracts feature synonyms not simply for closing the VE, but for introducing new words. Hence, the SYN-sequence is not congruent with the CLO-structure like in the above example. In fact, the CLO-sequence here serves as a transition between two VEs. The immediately following VE is illustrated by the use of italics.

T **If something is a boon?** Somebody who wants to make an educated guess?
Sf12 I think something nice, [something
T [yes
Sf12 useful,
T **Yes, true. A boon is like a blessing.**
T *Do you know what a blessing is? [When*
Ss *[yeah*
T *you go to church and the priest gives you a blessing (imitating a priest with imposing*
 arms)?
Sm10 <GERMAN> ein Segen

(orange = SIF, green = DIA, red = SYN, blue = CLO)

T **Essensreste.** </GERMAN> **If we had to say that in English? How could we say that? Food scraps.**
Sm16 What you throw away from a food.
T **Yes, food or parts of your food that you throw away. That are food scraps. Another way of saying this is leftovers.** *Because leftovers again, the things that you leave over,*
 <GERMAN> die Sachen, die man überlässt </GERMAN>
(orange = SIF, green = DIA, red = SYN, blue = CLO)

Finally, synonyms provided by the teacher precede the CLO-instances in order to enhance the students' responses:

T A means, <GERMAN> weiß das jemand?

Sm7 eine Option.

T Option, wir könnten auch sagen eine Art und Weise. Ja?

(orange = SIF, green = DIA, red = SYN, blue = CLO)

T <QUOTATIVE> It is particularly useful </QUOTATIVE>, particularly is another way of saying? (1) Particularly is? (5)

Sm15 <GERMAN> teilweise

T mhm

Sm1 im Großen und Ganzen

T Mhm. </GERMAN> Especially. <GERMAN> Besonders </GERMAN>. It's particularly useful, it's ESPECIALLY useful. <GERMAN> Es ist ganz besonders nützlich </GERMAN>.

(orange = SIF, green = DIA, red = SYN)

T Mhm, if I say I want you to do this immediately?

Ss <GERMAN> sofort </GERMAN>

T Mhm, right now, straight away. Right? So, immediately means right now, straight away.

(green = DIA, red = SYN, blue = CLO)

As mentioned in the beginning, eliciting synonyms is also used as a starting point in DIA-sequences. This is demonstrated in the following examples:

T Ja. </GERMAN> What would be another way of saying rural in English. Give me another word for rural.

Sf12 <GERMAN> Was heißt es auf Deutsch?

T ländlich. </GERMAN>

Sf5 countryside?

T mhm?

Sf5 countryside?

T In the countryside. Very good.

(green = DIA, red = SYN, blue = CLO)

T Who comes from an urban area here?

(Ss raise their arms)

T Mhm. What would be another word for urban area?

Sm1 city

T City, yes. Very good, ja? Very good.

(green = DIA, red = SYN, blue = CLO)

T Give me another way of saying convert in English. (2) super simple word.

Sm1 ah, to **to change**.

T **To change, super, exactly. So, the food is changed, converted into manure.**

(green = DIA, red = SYN, blue = CLO)

Here, the synonyms are provided by the students and reiterated by the teacher in her concluding statements.

To sum up, focusing on synonyms serves as a means for concluding a typical IRF-exchange, for introducing new words and thus launching into a new VE, for enhancing a student's response, and for encouraging increased student participation via "Give me another word for"-questions.

Dialogue (DIA)

Considering the already quoted extracts, the dominant green color, standing for DIA-techniques, is evident. Entering into a dialogue with the students is the most frequent characteristic of teacher-led VEs analyzed in this thesis (see Table 20, p. 76). In particular, the teacher relies on DIA when setting a word in focus, i.e. at the beginning of a VE. Asking a display question after quoting a certain word from the text is the prevalent method for continuing from the SIF-instance to the core of a VE, as shown in this example:

T **And what is <QUOTATIVE> efficient </QUOTATIVE>? If something is efficient**
<GERMAN> sag ma auf Deutsch auch das ist effizient. Aber was heißt denn das
eigentlich, wenn etwas effizient ist?

Sm10 Auf Deutsch? </GERMAN>

T Give me English if you can.

Sm10 So, efficient is when something is very (2) good.

(orange = SIF, green = DIA)

Other instances that especially feature DIA are DEF- and SYN-structures. Focusing on definitions, the teacher employs a dialogic approach in order to train the students' ability to explain certain concepts in their own words:

T **<QUOTATIVE> Providing </QUOTATIVE> is clear?**

Ss Yeah.

T **If you provide something, what do you do?**

Sf12 You, you offer something.

T **mhm. You offer something. Right.**

(orange = SIF, green = DIA, blue = CLO)

When focusing on synonyms, the DIA-technique primarily features the questions “What is another word for xy?”, “Can you give me another word for xy?”, “How else could we say xy in English?” etc. This is illustrated in the following:

T **However.** What is another English word for however?
 Sf3 whatever @@
 Sf12 so far
 T hmm, maybe not so far. **I would suggest (2) but.** **But.** You could say: But there is an **alternative.** Of course, on the level where you are, THIS (pointing at the text) sounds way better. **But if you need to find another way for saying more or less the same thing but might be a way to do this.**
 (orange = SIF, green = DIA, red = SYN, pink = SEN, blue = CLO)

Finally, DIA is also supported by sample sentences like in the next extract:

T **If I expect you to do something, what does this mean? To expect? I expect you to do your homework alone.**
 Sm10 <GERMAN> erwarten?
 T **Erwarten.** </GERMAN>
 (green = DIA, pink = SEN, blue = CLO)

All in all, DIA by definition relies on talk and thus it clearly belongs to the group of analytic strategies. Within this category, however, a special status has to be assigned to the DIA-instances since they co-occur to a great extent with the teaching of definitions, synonyms, and sample sentences. This specific position of DIA clearly outperforms the instances of VEs solely given by the teacher. In other words, the vast amount of analytic (and thus predominantly dialogic) strategies identified in the lessons at hand assigns this ENFS-classroom a highly interactive format. This will be discussed in more detail in 7.2. (p. 100).

In the following, the focus shifts towards VEs that feature animated strategies, which are characterized by non-verbal resources such as gestures or objects from around the classroom.

6.2.4. Animated strategies

Gesture (GES)

In the analyzed transcripts gestures either occur at the core of VEs, i.e. together with definitions or sample sentences, or, to a lesser extent, at the beginning, i.e. right after SIF-sequences. First, the use of gestures at the center of vocabulary explanations is demonstrated:

T <QUOTATIVE> Providing </QUOTATIVE> is clear?
 Ss Yeah.
 T If you provide something, what do you do?
 Sf12 You, you offer something.
 T mhm. You offer something. Right. I provide you with the translations for the words that you need. <GERMAN> Ja? Etwas anbieten <pointing from her towards the Ss>. Kennts ihr sicher von Internetprovider, [was
 Ss[ja
 T macht der? Der bietet euch das Internet an. Gegen Geld natürlich. Ja? So, das könnt ihr euch aufschreiben: to provide, anbieten </GERMAN>
 (orange = SIF, green = DIA, pink = SEN, purple = GES, blue = CLO)

T If something is steady?
 Sm7 <GERMAN> anhaltend </GERMAN>
 T mhm. How else could we say this in English? <GERMAN> Anhaltend ist gut </GERMAN>
 Sm7 constant
 T constant, very good. Steady is constant or is stable (illustrating a long horizontal line with her hands). It stays (2) the same. If something is stable it stays the same. It doesn't go up and down all the time (making wavy lines with her hands), it stays the same. Then it's steady. Right?
 (green = DIA, red = SYN, purple = GES, tawny = DEF, blue = CLO)

T And they are quiet. That's another plus. <WHISPERING> Yes? (2) Yes? (putting forefinger to the mouth) </WHISPERING>.
 (orange = SIF, purple = GES)

T So, you don't need to put a lot of stuff into your bin. You don't need to care about this. It's important that it's on a regular basis (showing a cyclic movement with her hand).
 (purple = GES)

As illustrated above, gestures underpin sample sentences, definitions, or they even serve as a means for explaining a vocabulary item without any use of a verbal description (cf. “quiet”, “regular”). While such an employment of gestures aims at conveying the meaning of a new word and tries to ensure this information transfer via addressing both the learners' auditive and visual perception, the following extracts illustrate the use of gestures aiming at stimulating student participation in guessing the meaning of a new word:

T Do you know what a blessing is? [When
 Ss [yeah
 T you go to church and the priest gives you a blessing (imitating a priest with imposing arms)?
 Sm10 <GERMAN> ein Segen
 T Ja, ein boon ist ein Segen, ein wahrer Segen,
 (green = DIA, purple = GES, blue = CLO)

T <QUOTATIVE> You may not have the space for a herd of pigs </QUOTATIVE>. Space?
 (spreading arms)
 Ss <GERMAN> Platz
 T Der Platz, ja. </GERMAN>
 (orange = SIF, purple = GES, blue = CLO)

Here, the gestures serve as hints on the meaning of the respective vocabulary item and thus they are meant to support the pupils with detecting the correct translation on their own. Since these GES-instances appear at the beginning of collaborative VEs, they are in fact congruent with the DIA-structure (cf. “Space?”). In other words, the beginning of the teacher-students-dialogue via a display question can be accompanied by a particular gesture.

Environmentally coupled gesture (ECG)

While the aforementioned description of gestures focuses on body language that does not include any further material around, environmentally coupled gestures are characterized by a clear reference to specific objects. Similar to gestures, such ECG-instances aim at increasing student participation and activating the learners’ L1 vocabulary. This is demonstrated in the subsequent examples:

T You can use shredded strips of newspaper. Newspaper is clear?
 Ss yes
 T Ahm, a strip is here (showing a strip of paper to the class)
 Ss <GERMAN> Streifen </GERMAN>.
 T This is a strip of paper.
 Sm2 <GERMAN> Ein Streifen </GERMAN>.
 T Mhm, this is a strip, ok?
 (orange = SIF, gray = ECG, blue = CLO)

T So, we we moisten it to the point that when I squeeze it in my hand, <GERMAN> eine Sekunde (squeezes a strip of paper in her hand), right?
 Sm10 zerquetschen </GERMAN>
 T You can also squeeze lemons. And oranges.
 Ss <GERMAN> ausdrücken </GERMAN>
 T Mhm.
 (orange = SIF, gray = ECG, blue = CLO)

In the above extracts, the use of a strip of paper exemplifies the message of the reading text that deals with the use of shredded newspapers as the suitable bedding material in a worm compost bin. These visualizations do not include any use of definitions or sample sentences, but solely convey the meaning of new vocabulary items by the mutual interplay of the teacher’s ‘performance’ and the students’ guessing.

The following example illustrates how ECGs are used to stimulate the students' guessing via considerable reference to the interior furnishing of the classroom:

- T So, you said you understand a <SLOW> worm compost BIN </SLOW>. What is a bin?
Can you show me a bin here in this room?
- Ss (pointing at the bin next to the blackboard)
- T Yes, exactly. We have a bin over here. (pointing to the bin). Can you see this one?
- Ss mhm
- T We also have some bins at the back (pointing at the back of the room). Yeah, that's a bin
(again pointing at the bin next to the blackboard). <GERMAN> Ja?
- SfX Mistkübel.
- T Genau. </GERMAN> So, this is a bin.
- (orange = SIF, green = DIA, gray = ECG, blue = CLO)

Here, the teacher relies on ECGs to enhance the students' initial response (pointing at the bin) by making them aware of some more bins and simultaneously providing brief verbal statements (e.g. "Yeah, that's a bin"). So, the ECGs here increase both the timeframe spent on one particular vocabulary item and the number of repetitions of the word 'bin'. Finally, one student provides the correct translation of the vocabulary item at hand.

Scene enactment (SCE)

This animated strategy usually refers to instances in which the students, two teachers, or the teacher and the students together perform a short role-play or spontaneously act out a brief scene in order to demonstrate the meaning of a certain word (Waring et al. 2013: 260). In the analyzed lessons here, however, all three existing SCE-sequences are exclusively performed by the teacher:

- T <GERMAN> Die Einheit, diese Box </GERMAN>. And it can be tucked away. I would like
to show you what it means if you tuck something away. I take my bag and I am now
going to tuck it away, ok? (taking her bag and putting it in the cupboard)
- Ss <GERMAN> verstauen
- T Verstauen, to tuck away.
- Sm1 verstauen
- T Verstauen, ja? </GERMAN> It's tucked away. (3) It could also be that you have a T-shirt,
like I have a T-shirt today, you see, it's NOT tucked, do you see it, it's outside of my jeans,
right? If somebody says, oh, what do you look like, you have to tuck in your shirt, then I
would have to go and tuck it in (tucking in her shirt). [Ok?
- Ss [ahso
- T <GERMAN> Das heißt also auch wo etwas hineinstecken, wegräumen im Sinne von das
T-shirt wegräumen. Ja? </GERMAN>
- (orange = SIF, cyan = SCE, blue = CLO)

In the above example the teacher performs the action of tucking away her bag, which is then supported by a sample sentence featuring the verb ‘to tuck away’. Next, she delivers a very short dialogue in which an imaginary character requires her to tuck in her shirt. These two little performances represent more than a simple or an environmentally coupled gesture due to the teacher moving around in the room and inventing two lines for an imagined dialogue (“[O]h, what do you look like, you have to tuck in your shirt”). A similar structure of the SCE-sequence can be seen in the next example, which also features an invented mini dialogue.

T **Temptation, that's the job of the devil.**
 Ss @
 T If the devil comes to you and, or can also be your best friends, and they know you are on a diet, and you really like chocolate, **then they will probably bring chocolate and tell you: Mhm, that's really the best chocolate ever, don't you want to take one, oh I know you are not supposed to. Uh, what a shame, I eat it for you (imitating a tempting tone).**
 Ss @
 T That's temptation.
 Ss <GERMAN> Versuchung
 T **Die Versuchung ist das, ja. Ja, die Versuchung, temptation.**
 (orange = SIF, cyan = SCE, blue = CLO)

The third SCE-instance identified in the HBLFA-transcripts includes the reproduction of a dialogue used in a listening comprehension and a subsequent mini performance visualizing both the plot of the dialogue and the teacher's experience with assessing the university students' responses to this listening comprehension. This example is the liveliest SCE-sequence in the analyzed lessons at hand.

T **<GERMAN> Ja, halt, da gleich, was ist denn ein kit? [...]**
 T Auf der, auf der Boku, ich unterrichte auch auf der Boku und dort gibt es eine Hörübung **und dort sagen sie, irgendwer fährt nach Marokko und ein anderer sagt, oh da musst du, da darfst du nicht vergessen das Erste-Hilfe-Set mitzunehmen.** Und die Studenten müssen halt eintragen was sie hören, nämlich first aid kit, Erste-Hilfe-Set. Und viele schreiben dann statt kit kid.
 Sm1 Erste-Hilfe-Kind </GERMAN>.
 T That's a child, right? **And it always makes me laugh 'cause imagine you're in Morocco and you walk somewhere round in the desert of Morocco and then behind you goes a little child (imitating the walk of a little child with a backpack)**
 Ss @@
 T **with all the first aid equipment. If you fall, you have everything there.**
 Ss @@
 T This is a kit. <GERMAN> Ein kit ist ein Set </GERMAN>. **This is what we are talking about here. Not a child.**
 Ss @@
 (orange = SIF, cyan= SCE, blue = CLO)

All the above SCE-instances especially differ from the previously described ECG-sequences with regard to the amount of body language and change of position as well as tone of the teacher's voice. For instance, the teacher moves to the shelf in the first SCE-example or she walks in the front of the class like a hiker. At the same time, a noticeable change in the teacher's voice takes place, imitating two different persons in each of the mini dialogues.

Drawing on blackboard (DBB)

The use of multi-modal means such as gestures, specific characteristics of language, or objects around, are central elements of animated strategies. All in all, they attempt to rely on the learners' visual faculties (cf. gestures) and their faculties of imagination (cf. scene enactment). Hence, including drawings is another typical feature of animated strategies. This is shown in the following extracts:

- T And we also have an undertray (drawing it on the blackboard) as well. They don't say this in the text but if you have this somewhere and you want to use the liquid we need to collect it somewhere, right? Because otherwise it's just running onto the floor. Right? So we might want to have an undertray as well. Right? This thing here is an undertray (pointing at the sketch on the blackboard). Where else do we find undertrays?
- Sf4 Ahm, for flowers.
- T Exactly. For flower pots, right? They normally also have an undertray. (4)
- Ss <GERMAN> Untersetzer
- T Untersetzer, genau, ja, sehr gut </GERMAN>.
- (dark gray = DBB, blue = CLO)

- T So, we said this is our bedding material (pointing at the drawing of a worm compost bin on the blackboard), the paper strips, we have the worms in there, and now we take the first batch that we have, a heap, batch <GERMAN> ist ein Haufel und heap ist auch ein Haufel, ok? </GERMAN> So we now put the first heap of material, any material, we put this in one corner (adds a heap to the drawing). Ok? So, we have the first batch of food scraps and place it in a heap on top of the bedding material in one corner.
- (dark gray = DBB, blue = CLO)

In both of the above examples the teacher adds a drawing of the respective vocabulary item to the already existing sketch. Nevertheless, two different procedures take place. While in the first example the translation of "undertray" is elicited from the students via (a) the drawing and (b) by focusing on the use of undertrays, the latter extract includes an immediate translation of "batch" by the teacher, which only then is enhanced by the drawing of it. Hence, drawings seem to be potentially useful at every stage of a VE, i.e. they could be integrated when setting a word in focus, when giving a definition or in the concluding phase of a VE.

Having illustrated the different ways of both analytic and animated strategies, these techniques of VEs, together with SIF- and CLO-strategies, are summarized in the following table.

Table 21: Strategies, their implementation, and aims of vocabulary explanations

Strategy	Implementation and aims
SIF (set in focus)	<ul style="list-style-type: none"> • Direct quote from reading text • Separate repetition of the respective word • Reiteration via display questions • Comparison of already known words to an unknown item • Reduction in pace of speech • Increase in volume • Use of L1 (German)
ANALYTIC STRATEGIES	
DEF (definition)	<ul style="list-style-type: none"> • Demonstration of how to explain words • Illustration of semantic relations • Acceleration of the VE
SEN (sample sentence)	<ul style="list-style-type: none"> • At the beginning of a VE: Providing a clue for guessing the meaning of the respective vocabulary item • At the end of a VE: Enriching a briefly given translation or definition
SYN (synonyms)	<ul style="list-style-type: none"> • A means for concluding a typical IRF-exchange • Introduction of a new word & transition to a new VE • Enhancement of a student's response • Catalysts for increased student participation
DIA (dialogue)	<ul style="list-style-type: none"> • At the beginning of a VE: Involvement of students via display questions (typically co-occurring with sample sentences) • Aiming at practicing the students' skills of explaining words and finding synonyms
ANIMATED STRATEGIES	
GES (gesture)	<ul style="list-style-type: none"> • Reinforcement of SEN- and DEF-strategies • Surrogate for verbal explanations
ECG (environmentally coupled gesture)	<ul style="list-style-type: none"> • Activation of the students' L1 vocabulary • Stimulation of the students' guessing • Increase in the amount of time spent on the respective item
SCE (scene enactment)	<ul style="list-style-type: none"> • Lively demonstration of the meaning of a certain word • Addressing the students' faculties of

	imagination
DBB (drawing on blackboard)	<ul style="list-style-type: none"> • Elicitation of translations from the students • Follow-up strategy when translation is provided by the teacher
CLO (closing)	<ul style="list-style-type: none"> • Summarizing “So”-statements • Comprehension checks • Brief iterative definitions • Evaluative statements based on the traditional IRF-sequence

While the above table compiles the results of the analysis of the lesson transcripts done in this part of the thesis, the following chapter is devoted to a detailed discussion of these insights and their potential impact on the teaching of ESP vocabulary.

7. Discussion

The present study tackled the two questions of lexical technicality of ENFS-teaching materials and the structure of vocabulary explanations in the ENFS-classroom. In what follows, both of these issues will be addressed in detail by (a) highlighting the main findings, (b) making references to essential aspects of research into vocabulary teaching, and (c) providing suggestions for future ENFS-vocabulary teaching at the College for Horticulture and Landscape Design in Vienna.

7.1. The use of reading texts in the ENFS classroom

The analysis of reading texts via readability formulas and Lextutor-calculations addressed the following research question:

To what extent do teaching materials of horticultural English feature general, academic, and technical English words and in how far do such words affect readability?

First of all, the amount of technical words directly correlates to the readability level. As shown in Figure 13 (p. 75, ch. 6.1.), the readability level of a text decreases if the number of off types increases. This correlation can serve as an essential factor when planning ENFS-lessons and with regard to the selection of adequate teaching materials. Readability scores, however, cannot serve as a basis for making inferences about the actual reader's involvement with a text. They only work as a checking principle *a priori*. As regards the detailed vocab profile, a quick Lextutor-analysis already sheds light on the degree of vocabulary activities that might be needed in order to appropriately teach a certain reading text. The higher the amount of off types, the more time should be spent on both the introduction and the active reproduction of vocabulary items. Moreover, the findings yielded via www.lexutor.ca provide insights with regard to classifying a text as an academic (notable amount of AWL types) or technical (significant number of off types) one. With the four sample teaching materials at hand the percentages of off types are remarkably higher than the respective amounts of academic words and thus the analyzed reading texts can be referred to as technical texts.

The classification as technical texts can be specified even more. Based on the semantic analyses of the four sets of off types in 6.1., all four teaching materials represent horticultural texts. The reading text "Plants of the Sequoia National Park" is the teaching material closest related to the field of horticulture since it significantly features vocabulary stemming from the

discipline of botany. Similarly, “Herbs” can be described as a typical horticultural text due to its vocabulary related to plant cultivation and characteristics of plants. The reading text “Redwood Trees”, although dealing with a horticultural topic (the cultivation of Redwood Trees based on their natural distribution), is actually ‘less horticultural’ since it considerably includes vocabulary from forestry and climatology, together with botanical technical terms. Finally, “Worms at Work” bears the least relationship to the horticultural discipline and seems to be addressing amateur gardeners and do-it-yourself enthusiasts. This complete gamut of specificity represents a striking example of how the teaching of ESP can be fine-tuned with regard to students that have just begun receiving exposure to specialized English lessons but who already possess horticultural expertise encoded in their L1. Beginning with teaching “Worms at Work”, ENFS-lessons in the first year of ESP gradually turn to more specific texts, so that “Plants of the Sequoia National Park” is successfully dealt with close to the end of that year.

Moreover, the present continuum of specificity in the reading texts is also reflected in the actual ESP-teaching. Representing the point of departure, “Worms at Work” is primarily taught via an extensive in-class reading of the text. As illustrated in 4.6. (p. 54), some vocabulary games or simple recaps are included at the beginning of each reading lesson. While such a firm guidance, or teacher-centeredness, is the basis for teaching “Worms at Work”, the students are gradually granted more independence with the other teaching materials. As an example, the teaching of the reading text “Herbs” requires the learners to undertake autonomous research with regard to the definition of ‘herb’ at first. Here, the students should talk to other teachers and gardeners at school as well as to their parents or other laypersons. Then, the different results are compared in class and only then the definitions given in the reading text are considered. After having spent some lessons on reading the text, the students are supposed to design modern herb knots over the course of two lessons. Then, basic presentation skills and techniques are introduced, which results in the students giving their very first subject-specific, i.e. horticultural, presentation in L2 (Weber 2016, personal communication).

The developmental stages from comprehending a text via a pure guided reading approach to giving a professional informative talk is completed by the “really challenging” (Weber 2016, personal communication, which is in accord with the remarkable low FRE-score of 39.47 (cf. Table 10, p. 67)) text of “Plants of the Sequoia National Park”. Here, the reading of the text is

supported by a short video that demonstrates the natural conditions of the Sequoias' native habitat. The insights gained by this video not only visualize the arguments of the reading text, but also provide further information on the topic of Sequoia trees. Being equipped with a profound understanding of this topic, the students finally participate in small group discussions ("Role Play", see Appendix 2) in which four different characters have to reach an agreement on the issue of protecting or logging Sequoias. This explicit communicative language teaching (CLT) approach finally focuses on the active and spontaneous production of speech and thus fosters fluency. In this way, the triad of detailed ESP-reading, planned ESP-presentations, and unrehearsed ESP-talk offers a carefully adjusted and in-depth involvement with specialized English based on appropriate reading texts during the first year of ENFS.

7.2. The teaching of vocabulary in the ENFS classroom

The recording of ENFS-classroom interaction and the detailed identification and analysis of vocabulary explanations examined the following research question:

How are vocabulary explanations in the ESP-classroom of ENFS sequentially organized?

In response to the above question both the general structure of VEs and their different potential strands of explanations at the core of VEs are summarized. To begin with, vocabulary explanations *set a word in focus* via two basic strategies, namely (a) direct emphasis of the respective item and (b) vocal aspects. Usually, these two techniques are combined and thus the special focus on an item via quoting from the text, repeating it separately after quoting, including it in a display question, or comparing it to already known words is often accompanied by a reduction in the pace of speech or/and an increase in volume. Occasionally, L1 is used to highlight some stylistic aspects, which aims at raising the students' interest in a specific vocabulary item. Such techniques of code-mixing, in which "a word or an expression from one language is used in a group of words whose structure belongs to another distinct language" (Celik 2003: 361), are "efficient and effective method[s]" (Celik 2003: 361) with particular regard to the introduction of new vocabulary. As an example, the following teacher-statements serve as successful SIF-strategies in order to shift the students' attention towards the word 'dustbin': 'Und dustbin ist ganz einritisches Wort. Was ist denn dust eigentlich?'

After setting a word in focus, the VE frequently reaches the stage of what Dalton-Puffer refers to as “division of labour” (2007: 158). Here, both the teacher and the students interact cooperatively to describe, define, and explain a word’s meaning. Given the fact that the teacher already knows (or should know) the various meanings of the vocabulary items occurring in the reading text, this mutual involvement in the VE should rather be described as a *staged division of labor* that primarily relies on display questions (and not on referential ones). A genuine division of labor might occur with regard to the explanations of arguments that deal with the “carrier content” (Dudley-Evans & St John 1998: 11) of the text such as ‘ways to handle the black fruit fly problem’ where the language teacher is not a subject specialist.

The *staged division of labor* occurring with vocabulary explanations, i.e. with language issues, is based on analytic strategies such as the use of sample sentences, synonyms, or definitions. Furthermore, animated strategies like the use of gestures or scene enactment are adopted in order to avoid mere verbal explanations. In particular, sample sentences and definitions are supported by gestures (see Table 21, p. 96). As an example, the explanation of the verb ‘to provide’ in the HBLFA-transcripts features a sample sentence that is underpinned by the teacher’s gesture of pointing from her towards the students in order to illustrate the relation between the provider and the recipient. This gesture is traditionally described as “iconic gesture” since its mode of performance resembles the semantic content of the word (McNeill & Levy 1993: 5). Another example is the explanation of ‘on a regular basis’ where the teacher shows a cyclic movement with her hand. Such a gesture illustrates an abstract idea rather than a specific action and is known as “metaphoric gesture” (McNeill & Levy 1993: 5). Finally, each instance of environmentally coupled gestures can be referred to as “deictic gestures” (McNeill & Levy 1993: 5) that include objects immediately around. The manifold use of gestures in combination with vocabulary explanations clearly aims at adding a visual component to analytic strategies. While such a reference to the students’ faculty of imagination tends to facilitate the comprehension of a new word, gestures, and animated strategies in general, furthermore serve as effective teaching techniques to increase student participation with regard to vocabulary explanations. It seems as if gestures, together with the display questions of DIA-sequences, provide the basis for a division of labor and thus an interactive classroom setting. Due to the rather low number of blackboard drawings used in the course of six ENFS-lessons (see Table 20, p. 76), it is suggested to include more sketches illustrating processes or objects mentioned in the respective reading text at hand. This will in

turn increase the overall number of animated strategies in the horticultural English classroom and thus result in easing the amount of teacher talk due to the replacement of verbal explanations. In so doing, the teacher may experience a more relaxed teaching.

Apart from the staged division of labor, VEs are occasionally given by the teacher herself. Here, the teacher provides the explanation of a vocabulary item without particular student involvement, e.g. by giving a quick definition of a certain word. The reason for such a deviation from the clearly identifiable interactional pattern (cf. the overall great amount of dialogic approaches, Table 20, p. 76) might lie in the acceleration of a VE due to time constraints or the repeated encounter of a specific item.

Following the staged division of labor, a vocabulary explanation typically turns to its closing in which the teacher either summarizes the explanation via the explicit signal “So” or delivers brief iterative definitions of the word just discussed. Alternatively, evaluative statements based on the traditional IRF-sequence end a VE when a student has provided a suitable explanation and the teacher decides to continue reading. If so, teacher-statements such as ‘City, yes, very good’ typically occur. Furthermore, the results yielded a high amount of comprehension checks appearing in CLO-sequences.

After the general outline of the sequential organization of vocabulary explanations, particular attention is devoted to the manner of contextualization and the aspect of comprehension checks. To begin with, the way of contextualizing vocabulary items will be discussed.

As shown in the previous chapter, the great preponderance of VEs embeds the respective new vocabulary in strategies that feature a noticeable amount of teacher talk. Additionally, single VEs rely on animated contextualization such as scene enactment. All in all, the clear attempt on the part of the teacher to present new vocabulary items in connection with sample sentences or gestures referring to objects around the classroom directly correlates with the learning of vocabulary. As stated by Carter (1998: 191), “[t]o know a word is also to know it in context. Syntactic and semantic knowledge must also include pragmatic knowledge”. This comprehensive focus on syntagmatic and paradigmatic relations as well as on the situational context is represented in the application of both analytic and animated VE strategies. For instance, syntagmatic relations can be emphasized by sample sentences (analytic) and paradigmatic aspects by synonyms (analytic). Animated strategies such as gestures or scene

enactment can shift the students' attention towards specific semantic information (e.g. the teacher showing a horizontal line with her hands when talking about 'steady'), particularly foregrounding paradigmatic relations when compared to antonyms (e.g. the teacher drawing a curvy line with her hands and referring to 'up and down'). Syntagmatic aspects are put to the fore when the teacher performs short mini dialogues in a scene enactment strategy and emphasizes the use of the respective word in one or more sample sentences accompanied by lively intonation and spontaneous acting (e.g. "Oh, what do you look like? You have to tuck in your shirt", *teacher tucking in her shirt*). Moreover, pragmatic information can be conveyed when the teacher makes social language use in the mini dialogues explicit and provides reasons for the choice of words.

Contextualization in the teaching of vocabulary facilitates the processes of guessing and making inferences based on clues stemming from the teacher's behavior or her verbal hints. Following Table 21 in the previous chapter (p. 96), one principal purpose for contextualizing vocabulary items is student involvement. Sample sentences provided at the beginning of a VE, environmentally coupled gestures, and drawings on the blackboard particularly encourage participation. Similarly, the reference to synonyms in L2 by the teacher can serve as a catalyst for increased student involvement when it comes to guessing the translation of a certain word.

Another effective method of contextualization is the use of definitions. Here, paradigmatic aspects can be stressed when two closely related words are distinguished via brief descriptions. However, the teacher has to be aware that students may have problems with clearly identifying teacher statements as definitions (Nation 2001: 87). In the analyzed lessons, the majority of DEF-instances lack a clear signal that explicitly introduces a defining statement. Thus, teacher-statements like "Diet has two meanings. One meaning [...]" are exceptional phenomena in ENFS-lessons. In most cases, the definition is simply added after a translation or in combination with synonyms, but without any further introduction.

All in all, the contextualization of new words via analytic and animated strategies successfully supports vocabulary explanations by assigning them a clear focus and emphasis on the respective vocabulary item. Different aspects of word knowledge can be presented and conveyed by the teacher, so that not only the words but also their syntagmatic, paradigmatic, and pragmatic facets are contextualized. Simply put, "[t]he context can give us the meaning"

(Levine 2000: 56). Furthermore, student participation can be considerably increased with the help of contextualization.

Turning to the issue of comprehension checks, a distinct difference between Waring et al.'s (2013) study and the research at hand, which is based on the former one, needs to be addressed. Waring et al. (2013: 262) note a complete lack of checking in their analysis, which means that the teachers they observed did not examine if their students had understood the vocabulary explanations at all. In the ENFS-lessons, however, numerous comprehension checks have been identified. All of them explicitly occur in CLO-sequences, i.e. right at the end of a VE, and take either the form of full questions such as "Does it make sense?" or of simple one-word-questions like "Right?". Since such comprehension checks serve, apart from examining understanding, the purpose of "[c]onversational [m]aintenance" (Nattinger & DeCarrico 1989: 121), which aims at following clear structures of beginning, continuing, and ending a conversation, the comprehension checks signaling the end of the 'conversation' vocabulary explanation seems to be effective in a classroom setting. The use of comprehension checks as explicit endings of VEs enables the students to recognize the shift back towards the reading text or a different aspect of the lesson. In this way, checks represent *rhetorical* elements for devoting the students' attention towards the teaching that had taken place before the VE was launched. This rhetorical function of comprehension checks, however, must not replace their original *evaluative* purpose. Asking the students the question "Does it make sense?" should primarily concentrate on the students' responses and only if they are positive, the aforementioned rhetorical power gains ground and the VE is closed without further notice. In the case of negative responses and the students' continuous struggle with the meaning of a certain word, the VE must be started anew by establishing an alternative contextualization.

Finally, the outstanding aspect of teacher-student-interaction in the vocabulary explanations at hand needs to be addressed separately.

In general, the analytic strategies are highly teacher-centered in terms of managing each individual instance of VE. As an example, in most cases the teacher decides which words should be focused on more closely and how much time is spent on each of these items. At first glance, this teacher-centeredness and the verbal explanations of word meanings resemble a highly traditional way of teaching and they even might be regarded as "constitut[ing] the

essence of teaching” (Waring et al. 2013: 262). Considering, however, the large number of dialogic strategies identified in the HBLFA-transcripts (see Table 20, p. 76), it becomes clear that the significant use of analytic explanations is clearly accompanied by the “*principle of engagement*” (Waring et al. 2013: 262, original emphasis), which explicitly aims at including the learners in the process of explaining and describing word meanings. This participatory element is an essential aspect in the teaching of vocabulary. Guessing the meaning of words, making inferences from clues provided by the teacher or deducing the word meaning directly from the actual word form are important procedures when learning vocabulary, particularly when the students develop into more self-reliant and thus independent learners (Carter 1998: 240). Hence, the teacher-led display questions and discussions of synonyms that have been identified with regard to dialogic approaches in the ENFS-lessons at hand are valuable teaching situations three years prior to the school leaving examination. These DIA-sequences clearly foster the students’ development of becoming autonomous learners and users of English. Although the teacher is primarily in charge of launching these DIA-sequences, she mainly acts like an interviewer by asking “What does this mean?” and “How else could we say in English?”. Furthermore, student-talk is significantly increased by teacher-led questions that directly respond to a student’s statement in a VE and ask, for instance, for some more synonyms or definitions. Via such a teacher-led lecture plus allocated roles, the whole class is encouraged to participate and in fact several students engage in many VEs collaboratively to come up with a word’s meaning, with the teacher being the facilitator of this process.

In sum, the teaching of vocabulary in the ENFS-classroom analyzed can be assessed as both convenient and effective. The teacher offers plenty of opportunities for the students summarizing and discussing information just read and thus the students can repeatedly use new vocabulary items in their contributions as well as noticing the application of specific words in various teacher statements such as definitions, sample sentences, or in connection with gestures. Next, the vocabulary explanations focus on multiple facets of new words such as syntactic and semantic knowledge. Occasionally, pragmatic knowledge is explained as well. Finally, the learners are actively involved in the process of inferring new word meanings as it was shown in the previous paragraph. These three aspects of a language-rich-environment, a great focus on word knowledge, and active engagement on the part of the students characterize “good vocabulary instruction” (Blachowicz et al. 2006: 527).

Based on the above discussion, possible implications arising from the “*principle of engagement*” (Waring et al. 2013: 262, original emphasis) and its resulting active student involvement will be considered. This, then, leads to the discussion of selecting ENFS-teaching materials in order to emphasize the important role of the teacher-student-cooperation in this process as well.

7.3. Implications for ENFS-teaching

Increased student participation together with the progress from guided learners to independent ones is particularly important in ENFS since the students experience this subject only for two years. Apart from actively involving the students in in-class vocabulary explanations, they should also be trained in recognizing various roots and affixes as well as using extra resources such as dictionaries or thesauruses in order to successfully pursue the “avenue to independence” (Blachowicz et al. 2006: 530). In particular, the latter can raise the students’ motivation for word learning if the potential of (online) dictionaries is effectively included in classroom activities and homework tasks. As regards the ENFS-classroom, the “Gardener’s Dictionary” of the National Gardening Association (<http://garden.org/nga/dictionary/>) offers one way to “[b]rea[k] the garden language code” (National Gardening Association 2016). For instance, learners can be expected to look for the meaning of ‘bud’ and present its manifold options as a root. Consequently, words like ‘budding’, ‘bud mutation’, ‘budworm’, or ‘to disbud’ can be compared. In general, the use of specialized online dictionaries as well as of glossaries and terminology databanks in ESP-classes can “greatly enhance the language classroom” (Krajka 2007: 6) since specialized reading texts can be dealt with in a more adequate way by detecting the true meanings of technical words. Furthermore, those online resources can serve as starting points for language activities, writing tasks etc. and thus they can have a backwash on the teacher, who might expand his/her own vocabulary knowledge of a specific discipline when designing tasks based on online resources. Concerning the ENFS-classroom, the glossary of genuine technical gardening terms (<http://usagardener.com/glossary.php>), the terminology databank of the horticultural classification system (<http://www.ext.colostate.edu/mg/Gardennotes/121.html>) as well as the aforementioned horticultural online dictionary seem to be highly recommendable online resources for designing ENFS-lessons.

Apart from becoming independent learners, ENFS-students need to be equipped with a suitable horticultural English lexicon. Hence, the aforementioned narrow timeframe of two

years requires the teacher to primarily convey word meanings via language in context than teaching, for instance, grammar. This, however, is a typical hallmark of ESP (Xhaferi 2010: 236). The teaching of horticultural terms via language in context is based on both expository and more narrative texts stemming from gardening magazines, horticultural scientific journals, or websites of international gardening associations. Consequently, the ENFS-teaching of horticultural vocabulary is rather based on different horticultural topics than on a specific set of generic gardening terms and aims at teaching both single words in context and collocations (e.g. *herd of pigs*). This raises the question of how the teaching material in ENFS is chosen.

Currently, the two ENFS-teachers at the College for Horticulture and Landscape Design select the reading texts primarily independently and based on their beliefs about the relevance of topics for each class. Sometimes this decision-making process might be guided by the teachers' individual preferences of plants and horticultural issues (the "carrier content" (Dudley-Evans & St John 1998: 11)), whereas in other cases a text might be convincing due to its exemplary structure or representation of a certain text type, i.e. its "real content" (Dudley-Evans & St John 1998: 11) for horticultural *English lessons*. From time to time, ENFS-students express their wishes about reading and learning more about specific horticultural topics in English.

In general, both the carrier and the real content need to be considered when selecting a text, but the final decision should ideally be based on the real one (Dudley-Evans & St John 1998: 99). ENFS as a representative of ESP clearly belongs to the ELT continuum (see ch. 2.2., p. 6) and as such its principles of teaching have to be in accordance with language teaching in the first place. Hence, considerations of the respective curricular objectives as well as of a text's significance for the language teaching classroom are essential in the first place. Nevertheless, the students' interest and their profession-related needs have to be considered as well. While language teaching aspects clearly have to be assessed and justified by the ENFS-teachers, both subject specialists and ENFS-learners might also effectively contribute to the selection process of texts taught in ENFS. They can express their wishes and perspectives with regard to which carrier contents might be of great value for their professional needs. Given the fact the ENFS, although clearly belonging to the ELT realm, is influenced by content subjects (see ch. 4.3., p. 51), this vital role of subject specialists in selecting texts should not be ignored (Dudley-Evans & St John 1998: 98). Thus, the following recommendation is put forward: An advisory panel consisting of the two ENFS-teachers, two

students from each grade in which ENFS is taught, and three subject specialists (e.g. one landscape designer, one dendrologist, and one vegetable expert) should be established at the beginning of the school year. Over the course of the winter term, this committee should meet three times and discuss and work on the following three questions:

- What is the key role of each committee member in the process of establishing a method of selection for ENFS-teaching materials?
- Which insights should serve as the basis for our decisions with regard to selecting ENFS material? How are those insights gained?
- In how far is the designed method of selection practical and effective?

At the end of the winter term this HOME (Horticultural Material *for* English) committee reflects on the advisory activities and agrees on further steps with regard to the process of material selection in ENFS. The preposition *for* in the committee's name highlights the paramount position of language teaching in relation to horticultural carrier contents.⁶

Finally, a commentary on (ESP) teacher education is put forward:

The use of analytic and animated strategies and the detailed structure of vocabulary clarifications presented in this thesis can serve as examples of good practice in ELT (and thus in ESP) teacher education. Given the fact that the horticultural English classroom was found to be an example of "good vocabulary instruction" (Blachowicz et al. 2006: 527), the detailed study of how to structure cooperative vocabulary explanations may result in successfully raising prospective teachers' awareness of their own language and its effect on underlying pedagogic goals and the students' learning process. The concise description of classroom interaction from the vocabulary teaching perspective can support future language teachers in acquiring such a proper "Classroom Interactional Competence (CIC)" (Walsh 2011: 21).

Concerning limitations of the study, it is worth noting that the results of this research are not applicable to other ESP courses since they are based on the behavior of one teacher. In order to gain comparable data and insights, it is recommended to record and analyze a larger set of ESP settings over a longer period of time, e.g. at sequential well-chosen dates during a school year, and including various teachers. The observation of classroom interaction based on such

⁶ The preposition *for* in the committee's name highlights the paramount position of language teaching in relation to horticultural carrier contents.

a precise longitudinal approach paves the way for describing potential developments in both the teaching and learning of ESP vocabulary. Moreover, the consideration of several ESP classrooms allows for a profound investigation of how different teaching materials are chosen *in situ*, which can result in outlining these individual processes and providing mutual proposals for improvement. The Austrian agricultural vocational colleges and their various specified agricultural English lessons could serve as a suitable empirical field for such a follow-up study.

8. Conclusion

The aim of the empirical study presented in this thesis was to describe both the input material and the structure of horticultural vocabulary explanations to prospective landscape designers. Two research foci were employed in order to gain detailed insights into the types of vocabulary that are taught as well as the clarifications of meanings of vocabulary items in the course of the teaching process. While the material analysis was based on investigating the vocab profile of four horticultural sample reading texts, the structures of vocabulary explanations were identified on the basis of six videotaped horticultural English lessons.

The lexical analyses of the teaching materials included the calculations of both the Flesch-Reading-Ease (FRE) and the Flesch-Kincaid-Grade-Level (FK). Furthermore, the extent of general, academic, and technical vocabulary was determined via the vocab profiler www.lexutor.ca (Cobb 2016), which is based on Laufer & Nation's lexical frequency profilers. The results of the two readability formulas and the Lextutor-calculations indicated a gradual increase of the amount of specified vocabulary, with the teaching material "Worms at Work" being a "standard" (Flesch 1948: 230) reading text and "Plants of the Sequoia National Park" representing a "difficult" one (Flesch 1948: 230). These lexical differences in all four teaching materials were supported by a close analysis of the "off types" (Cobb 2016) that displayed different degrees of discipline-specific vocabulary according to the respective text's FRE. As an example, the challenging teaching material "Plants of the Sequoia National Park" features a remarkable variety of botanical terms as well as expressions belonging to geography and forestry.

The sequential structuring of vocabulary explanations (VE) in classroom discourse was analyzed following the types of vocabulary explanations proposed by Waring et al. (2013), namely analytic and animated strategies. This method of analysis allowed for a precise micro-analytic investigation of "exchange[s] of utterances between the teacher and students, which deal with any explanation concerning a vocabulary item" (Xie 2013: 437). The results show a clear preference for contextualizing vocabulary items via analytic strategies. In particular, the teacher uses display questions for signaling VE-sequences and she actively involves the students in guessing and clarifying the meanings of words. This *staged* "division of labour" (Dalton-Puffer 2007: 158) is further stimulated by the use of sample sentences and synonyms that facilitate the guessing of word meanings.

Another significant result is the high amount of comprehension checks found at the end of vocabulary explanations. Unlike Waring et al.'s study (2013), the data at hand demonstrates a regular use of brief checks such as "Right?" or "Does it make sense?". While such comprehension checks clearly serve an evaluative purpose in the first place, they also work as effective markers illustrating the end of a VE-sequence.

The insights gained by the close analysis of both teaching materials and classroom discourse carry implications for the teaching of specified English vocabulary. First, the students should be trained in using subject-related dictionaries independently. This method seems to adequately complement the already pursued goal of self-activity with regard to clarifying vocabulary in class. Moreover, specialized dictionaries can prove to be valid resources for the teacher when it comes to designing discipline-specific language teaching activities. Next, the process of selecting materials for the horticultural English classroom might be reconsidered. The English language teacher should ideally collaborate with both the students and subject specialists in order to reach a perfect match between a stimulating thematic "carrier content" and a profound linguistic "real content" (Dudley-Evans & St John 1998: 11).

To summarize, the selection and development of teaching materials that consider the students' needs as well as the elaborated structuring of vocabulary explanations need to be constantly reconsidered by both practicing ESP instructors and EFL teachers that are about to teach an ESP course. This thesis has shed light on the aspects of assessing lexical technicality of reading texts, the ways of contextualizing vocabulary in classroom discourse, and the overall roles that characterize a reflective ESP educationalist. ESP needs didactically specialized English teachers.

9. References

- Anthony, Laurence. 2011. "Products, processes and practitioners: A critical look at the importance of specificity in ESP". *Taiwan International ESP Journal* 3(2), 1-18.
- Austin, John L. 1975. *How to Do Things with Words*. (2nd edition, ed. by James O. Urmson and Marina Sbisa). Cambridge, MA: Harvard University Press.
- Basturkmen, Helen. 2006. *Ideas and Options in English for Specific Purposes*. Mahwah, NJ: Erlbaum.
- Basturkmen, Helen. 2010. *Developing Courses in English for Specific Purposes*. Basingstoke: Palgrave Macmillan.
- Behnam, Biook; Pouriran, Yassamin. 2009. "Classroom discourse: Analyzing teacher/learner interactions in Iranian EFL task-based classrooms". *Porta Linguarum* 12, 117-132.
- Belcher, Diane D. 2006. "English for Specific Purposes: Teaching to perceived needs and imagined futures in worlds of work, study, and everyday life". *TESOL Quarterly* 40(1), 133-156.
- Blachowicz, Camille L.; Fisher, Peter J.; Ogle, Donna; Watts-Taffe, Susan. 2006. "Theory and research into practice: Vocabulary: Questions from the classroom". *Reading Research Quarterly* 41(4), 524-539.
- Brannen, Julia. 2005. "Mixed methods research: A discussion paper". *National Centre for Research Methods*. <http://eprints.ncrm.ac.uk/89/1/MethodsReviewPaperNCRM-005.pdf> (21 March 2016).
- Breen, Michael P. 1985. "Authenticity in the language classroom". *Applied Linguistics* 6(1), 60-70.
- Brown, Cheryl; Payne, M. E. 1994. *Five essential steps of processes in vocabulary learning*. Paper presented at the TESOL Convention, Baltimore, MD.
- Browne, Charles; Culligan, Brent; Phillips, Joseph. 2013. *A New General Service List (1.01)*. <http://www.newgeneralservicelist.org> (26 Feb 2016).
- Byram, Michael. 2004. *Routledge encyclopedia of language teaching and learning*. London: Routledge.
- Cao, Jifeng. 2014. "A survey on ESP teaching in Changchun University of Science and Technology". *Theory and Practice in Language Studies* 4(12), 2507-2512.
- Carter, Ronald. 1998. *Vocabulary: Applied Linguistics Perspectives*. (2nd edition). New York: Routledge.
- Celik, Mehmet. 2003. "Teaching vocabulary through code-mixing". *ELT Journal* 57(4), 361-369.
- Chambers, F. 1980. "A re-evaluation of needs analysis". *ESP Journal* 1(1), 25-33.
- Chomsky, Noam. 1965. *Aspects of the theory of syntax*. (2nd edition). Cambridge, MA: MIT Press.
- Chung, Teresa M.; Nation, Paul. 2003. "Technical vocabulary in specialised texts". *Reading in a Foreign Language* 15(2), 103-116.
- Chung, Teresa M.; Nation, Paul. 2004. "Identifying technical vocabulary". *System* 32, 251-263.
- Cobb, Tom. 2010. "Learning about language and learners from computer programs". *Reading in a Foreign Language* 22(1), 180-200.
- Cobb, Tom. 2016. *Web Vocabprofile*. <http://www.lexutor.ca/vp/eng/> (26 Feb 2016).
- Council of Europe. 2001. *Common European Framework of Reference for Languages: Learning, Teaching, Assessment*. http://www.coe.int/t/dg4/linguistic/source/framework_en.pdf (22 March 2016).
- Coxhead, Averil. 1998. *An academic word list*. Wellington: University of Wellington.
- Coxhead, Averil. 2000. "A New Academic Word List". *TESOL Quarterly* 34(2), 213-238.

- Coxhead, Averil. 2013. "Vocabulary and ESP". In Paltridge, Brian; Starfield, Sue (eds.). *The Handbook of English for Specific Purposes*. Malden, MA: Wiley-Blackwell, 115-132.
- Creswell, John W. 2003. *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. (2nd edition). London: Sage Publications.
- Csizér, Kata; Kontra, Edit H. 2012. "ELF, ESP, ENL and their effect on students' aims and beliefs: A structural equation model". *System* 40, 1-10.
- Dalton-Puffer, Christiane. 2007. *Discourse in Content and Integrated Learning (CLIL) Classrooms*. Amsterdam: John Benjamins.
- Dörnyei, Zoltán. 2007. *Research Methods in Applied Linguistics: Quantitative, Qualitative and Mixed Methodologies*. Oxford: Oxford University Press.
- Douglas, Dan. 2000. *Assessing Languages for Specific Purposes*. Cambridge: Cambridge University Press.
- Dudley-Evans, Tony; St John, Maggie J. 1998. *Developments in ESP: A multi-disciplinary approach*. Cambridge: Cambridge University Press.
- Feak, Christine B. 2013. "ESP and Speaking". In Paltridge, Brian; Starfield, Sue (eds.). *The Handbook of English for Specific Purposes*. Malden, MA: Wiley-Blackwell, 35-53.
- Flesch, Rudolf. 1948. "A New Readability Yardstick". *Journal of Applied Psychology* 32(3), 221-233.
- Flowerdew, John. 1992. "Definitions in Science Lectures". *Applied Linguistics* 13(2), 202-221.
- Forman, Ross. 2012. "Six functions of bilingual EFL teacher talk: Animating, translating, explaining, creating, prompting and dialoguing". *RELC Journal* 43(2), 239-253.
- Gairns, Ruth; Redman, Stuart. 1986. *Working with words: A guide to teaching and learning vocabulary*. Cambridge: Cambridge University Press.
- García Mayo, María del Pilar. 2000. *English for Specific Purposes: Discourse Analysis and Course Design*. Bilbao: Universidad del País Vasco.
- Gardner, Robert C.; Lambert, Wallace E. 1959. "Motivational variables in second-language acquisition". *Canadian Journal of Psychology* 13(4), 266-272.
- Gardner, Rod; Mushin, Ilana. 2013. "Teachers telling. Informings in an early years classroom". *Australian Journal of Communication* 40(2), 63-81.
- George, Klare R.; Buck, Byron. *Know your reader: The scientific approach to readability*. New York: Hermitage House.
- Ghafournia, Narjes; Sabet, Shokoofeh A. 2014. "The most prominent roles of an ESP teacher". *International Education Studies* 7(11), 1913-9039.
- Goh, Christine C. 2013. "ESP and Listening". In Paltridge, Brian; Starfield, Sue (eds.). *The Handbook of English for Specific Purposes*. Malden, MA: Wiley-Blackwell, 55-76.
- Gollin-Kies, Sandra; Hall, David R.; Moore, Stephen H. 2015. *Language for Specific Purposes*. Basingstoke: Palgrave Macmillan.
- Grainger, Teresa. 1999. "Conversations in the classroom: Poetic voices at play". *Language Arts* 76(4), 292-297.
- Haastруп, Kirsten. 1989. "The learner as word processor". In Nation, Paul; Carter, Ron (eds.). *Vocabulary Acquisition*. Amsterdam: Free University Press, 34-46.
- Habermas, Jürgen. 1991 [1962]. *Strukturwandel der Öffentlichkeit / The Structural Transformation of the Public Sphere*. (transl. by Thomas Burger; Lawrence, Frederick). Cambridge, MA: MIT Press.
- Harwood, Nigel. 2005. "What do we want EAP teaching materials for?". *Journal of English for Academic Purposes* 4, 149-161.
- Hatch, Evelyn; Brown, Cheryl. 1995. *Vocabulary, Semantics, and Language Education*. Cambridge: Cambridge University Press.
- Hirvela, Alan. 2013. "ESP and Reading". In Paltridge, Brian; Starfield, Sue (eds.). *The*

- Handbook of English for Specific Purposes*. Malden, MA: Wiley-Blackwell, 77-94.
- Hochhauser, Mark. 1999. "Pros and cons of readability formulas". *Clarity* 44, 22-28.
- Hutchinson, Tom; Waters, Alan. 1987. *English for Specific Purposes: A learning-centered approach*. Cambridge: Cambridge University Press.
- Hüttner, Julia; Smit, Ute. 2012. "Developing student teachers' 'pedagogical content knowledge' in English for Specific Purposes: The 'Vienna ESP Approach'". In Hüttner, Julia; Mehlmauer-Larcher, Barbara; Reichl, Susanne; Schiftner, Barbara (eds.). *Theory and Practice in EFL Teacher Education*. Bristol: Multilingual Matters, 164-185.
- Hyland, Ken. 2002. "Specificity revisited: how far should we go now?". *English for Specific Purposes* 21, 385-395.
- Hyland, Ken. 2013. "ESP and Writing". In Paltridge, Brian; Starfield, Sue (eds.). *The Handbook of English for Specific Purposes*. Malden, MA: Wiley-Blackwell, 95-113.
- Hymes, Dell H. 1972. "Models of the interaction of language and social life". In Gumperz, John J. (eds.). *Directions in sociolinguistics: The ethnography of communication*. New York: Holt, Rinehart & Winston, 35-71.
- Hymes, Dell H. 1974. *Foundations in sociolinguistics: An ethnographic approach*. Philadelphia: University of Pennsylvania Press.
- Hymes, Dell H. 1989. "Ways of speaking". In Bauman, Richard; Sherzer, Joel (eds.). *Explorations in the ethnography of speaking*. (2nd edition). Cambridge: Cambridge University Press, 433-451.
- Johns, Ann M. 2013. "The History of English for Specific Purposes Research". In Paltridge, Brian; Starfield, Sue (eds.). *The Handbook of English for Specific Purposes*. Malden, MA: Wiley-Blackwell, 95-113.
- Johnson, Keith; Johnson, Helen (eds.). 1998. *Encyclopedic Dictionary of Applied Linguistics. A Handbook for Language Teaching*. Oxford: Blackwell.
- Jordan, Robert R. 1997. *English for academic purposes: a guide and resource book for teachers*. Cambridge: Cambridge University Press.
- Joyce, Paul. 2015. "L2 vocabulary learning and testing: the use of L1 translation versus L2 definition". *The Language Learning Journal*. <http://dx.doi.org/10.1080/09571736.2015.1028088> (27 Apr. 2016).
- Kennedy, Chris; Bolitho Rod. 1984. *English for Specific Purposes*. London: Macmillan.
- Kincaid, Peter J.; Fishburne, Robert P.; Rogers, Richard L.; Chissom, Brad S. "Derivation of new readability formulas (Automated Readability Index, Fog Count and Flesch Reading Ease Formula) for navy enlisted personnel". *Research Branch Report* 8-75, 1-40.
- Krajka, Jaroslaw. 2007. "Online Lexicological Tools in ESP – Towards an Approach to Strategy Training". *Scripta Manent* 3(1), 3-19.
- Levine, Harold. 2000. *Vocabulary for the High School Students*. New York: Amasco.
- Marra, Meredith. 2013. "English in the workplace". In Paltridge, Brian; Starfield, Sue (eds.). *The Handbook of English for Specific Purposes*. Malden, MA: Wiley-Blackwell, 175-192.
- Maroni, Barbara; Gnisci, Augusto; Pontecorvo, Clotilde. 2008. "Turn-taking in classroom interactions: Overlapping, interruptions and pauses in primary school". *European Journal of Psychology of Education* 23(1), 59-76.
- McCarthy, Michael; O'Keeffe, Anne; Walsh, Steve. 2010. *Vocabulary matrix: understanding, learning, teaching*. Hampshire: Heinle Cengage Learning.
- McDonough, Jo. 2010. "English for specific purposes: a survey review of current materials". *ELT Journal* 64(4), 462-477.
- McGee, Jeanne. 2010. *Using readability formulas: A cautionary note*. <https://www.cms.gov/outreach-and-education/outreach/writtenmaterialstoolkit/down>

- loads/toolkitpart07.pdf (6 March 2016).
- McNeill, David; Levy, Elena T. 1993. "Cohesion and gesture". *Discourse Processes* 16, 363-386.
- Meyer, Hilbert. 2002. "Unterrichtsmethoden". In Kiper, Hanna; Meyer, Hilbert; Topsch, Wilhelm (eds.). *Einführung in die Schulpädagogik*. Berlin: Cornelsen, 109-121.
- Milton, James. 2009. *Measuring second language vocabulary acquisition*. Bristol: Multilingual Matters.
- Ministry of Agriculture, Forestry, Environment and Water Management. 2016a. *Agrarische Schulen und Hochschulen*. <https://www.bmlfuw.gv.at/land/land-bbf/bildung-agrar-schulen.html> (21 March 2016).
- Ministry of Agriculture, Forestry, Environment and Water Management. 2016b. *Höhere Bundeslehranstalten der Land- und Forstwirtschaft*. <https://www.bmlfuw.gv.at/land/land-bbf/bildung-agrar-schulen/hbla.html> (21 March 2016).
- Ministry of Education and Women's Affairs. 2016. *Bildungswege in Österreich 2015/16*. <https://www.bmbf.gv.at/schulen/bw/ueberblick/bildungswege2015.pdf?55jtm8> (21 March 2016).
- Nation, Ian S. P. 2001. *Learning Vocabulary in Another Language*. Cambridge: Cambridge University Press.
- National Gardening Association. 2016. *Gardener's Dictionary*. <http://garden.org/nga/dictionary/> (2 May 2016).
- Nattinger, James R.; DeCarrico, Jeanette S. 1989. "Lexical phrases, speech acts and teaching conversation". In Nation, Paul; Carter, Ron (eds.). *Vocabulary Acquisition*. Amsterdam: Free University Press, 118-139.
- Nickerson, Catherine. 2013. "English for Specific Purposes and English as a Lingua Franca". In Paltridge, Brian; Starfield, Sue (eds.). *The Handbook of English for Specific Purposes*. Malden, MA: Wiley-Blackwell, 445-460.
- O'Brien, Harry R. 1914. "Agricultural English". *The English Journal* 3(8), 470-479.
- Online Etymology Dictionary. 2016. *Specific*. <http://www.etymonline.com/index.php?term=specific> (8 Feb 2016).
- Paltridge, Brian; Starfield, Sue (eds.). 2013. *The Handbook of English for Specific Purposes*. Malden, MA: Wiley-Blackwell, 445-460.
- Parkinson, Jean. 2013. "English for Science and Technology". In Paltridge, Brian; Starfield, Sue (eds.). *The Handbook of English for Specific Purposes*. Malden, MA: Wiley-Blackwell, 155-173.
- Pauli, Christine. 2012. *Videographie in der empirischen Unterrichtsforschung*. https://www.ph-freiburg.de/fileadmin/dateien/fakultaet3/mathe/summerschool/Pauli_Freiburg_GDM2012.pdf (21 March 2016).
- Plag, Ingo; Arndt-Lappe, Sabine; Braun, Maria; Schramm, Mareile. 2015. *Introduction to English Linguistics*. (3rd edition). Berlin: De Gruyter.
- Platzer, Hans. 2015. EFL Testing and Assessment [Seminar, Department of English, University of Vienna] 9 Dec.
- Potocka, Dorota; Sierocka, Halina. 2013. "The ESP teacher as researcher". *Studies in Logic, Grammar and Rhetoric* 34(47), 175-188.
- Redish, Janice G. 2000. "Readability formulas have even more limitations than Klare discusses". *ACM Journal of Computer Documentation* 24(3), 132-137.
- Riahipour, Parisa; Saba, Zeinab. 2012. "ESP vocabulary instruction: Investigating the effect of using a game oriented teaching method for learners of English for nursing". *Journal of Language Teaching and Research* 3(6), 1258-1266.
- Richards, Jack C. 1976. "The role of vocabulary teaching". *TESOL Quarterly* 10(1), 77-89.
- Richards, Jack C.; Schmidt, Richard. 2002. *Longman Dictionary of Language Teaching and*

- Applied Linguistics*. London: Longman.
- RIS (Rechtsinformationssystem). 2016a. *Gesamte Rechtsvorschrift für Lehrpläne – höhere land- und forstwirtschaftliche Lehranstalten*.
<https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=20003547&ShowPrintPreview=True> (21 March 2016).
- RIS (Rechtsinformationssystem). 2016b. *Gesamte Rechtsvorschrift für Lehrpläne – allgemeinbildende höhere Schulen*.
<https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=10008568> (21 March 2016).
- Robinson, Pauline. 1991. *ESP Today: A Practitioner's Guide*. New York: Prentice Hall.
- Saks, Mike. 2012. "Defining a profession: The role of knowledge and expertise". *Professions and Professionalism* 2(1), 1-10.
- Schmitt, Norbert. 2007. "Current perspectives on vocabulary teaching and learning". In Cummins, Jim; Davison, Chris (eds.). *International Handbook of English Language Teaching*. Cham: Springer, 827-841.
- Schmitt, Norbert. 2016. *Useful websites for vocabulary*.
<http://www.norbertschmitt.co.uk/resources.html> (28 Feb 2016).
- Schouten-van Parreren, Caroline. 1989. "Vocabulary learning through reading: which conditions should be met when presenting words in texts?". In Nation, Paul; Carter, Ron (eds.). *Vocabulary Acquisition*. Amsterdam: Free University Press, 75-85.
- Schramm, Karen. 2014. "Besondere Forschungsansätze: Videobasierte Unterrichtsforschung". In Settinieri, Julia; Demirkaya, Sevilen; Feldmeier, Alexis; Gültekin-Karakoç, Nazan; Riemer, Claudia (eds.). *Empirische Forschungsmethoden für Deutsch als Fremd- und Zweitsprache*. Schöningh: UTB.
- Schriver, Karen A. 2000. "Readability formulas in the new millennium: What's the use?". *ACM Journal of Computer Documentation* 24(3), 138-140.
- Scrivener, Jim. 2005. *Learning Teaching: The Essential Guide to English Language Teaching*. (2nd edition). Oxford: Macmillan.
- Searle, John R. 1969. *Speech acts: An Essay in the Philosophy of Language*. Cambridge: Cambridge University Press.
- Shing, Soo R.; Sim, Tam S. 2011. "EAP needs analysis in higher education: Significance and future direction". *English for Specific Purposes World* 33(11), 1-11.
- Sierocka, Halina. 2008. "The role of the ESP teacher". *The Teacher* 2(56), 33-37.
- Silverman, Stephen; Solmon, Melinda. 1998. "The unit of analysis in field research: Issues and approaches to design and data analysis". *Journal of Teaching in Physical Education* 17, 270-284.
- Smit, Ute. 2010. *English as a Lingua Franca in Higher Education: A Longitudinal Study of Classroom Discourse*. Berlin: De Gruyter.
- Smoak, Rebecca. 2003. "What is English for Specific Purposes?". *English Teaching Forum* 41(2), 22-27.
- Sonbul, Suhad; Schmitt, Norbert. 2010. "Direct teaching of vocabulary after reading: Is it worth the effort?". *ELT Journal* 64(3), 253-260.
- Stake, Robert E. 1994. "Case studies". In Denzin, Norman K.; Lincoln, Yvonna S. (eds.). *Handbook of Qualitative Research*. London: Sage Publications, 236-247.
- Strevens, Peter. 1988a. "ESP after twenty years: A re-appraisal". In Tickoo, Makhan L. (ed.). *ESP State of the Art*. Singapore: Seameo Regional Centre, 1-13.
- Strevens, Peter. 1988b. "The learner and teacher of ESP". In Chamberlain, Dick; Baumgardner, Robert J. (eds.). *ESP in the Classroom: Practice and Evaluation*. Oxford: British Council, 39-44.
- Swales, John (ed.). 1988. *Episodes in ESP: A source and reference book on the development of English for science and technology*. New York: Prentice Hall.

- Tabatabaei, Omid. 2007. "Who qualifies to monitor an ESP course: A content teacher or a language teacher?". *Indian Journal of Applied Linguistics* 33(1), 77-85.
- Tatzl, Dietmar. 2011. "English-medium masters' programmes at an Austrian university of applied sciences: Attitudes, experiences and challenges". *Journal of English for Academic Purposes* 10, 252-270.
- Upton, Thomas A. 2012. "LSP at 50: Looking back, looking forward". *Ibérica* 23, 9-28.
- Wagner-Alt, Christiane; Jakab, Andrea. 2010. *Ein Blick in deine Zukunft. Höhere land- und forstwirtschaftliche Schulen*. <https://www.bmlfuw.gv.at/land/land-bbf/bildung-agrar-schulen/hbla.html> (21 March 2016).
- Wallace, Michael. 1982. *Teaching Vocabulary*. London: Heinemann.
- Walsh, Steve. 2011. *Exploring Classroom Discourse. Language in Action*. London: Routledge.
- Wang, Tz-Li; Lien, Ya-Hui B. 2013. "The power of using video data". *Quality & Quantity* 47, 2933-2941.
- Waring, Hansun Z.; Creider, Sarah Ch.; DiFelice Box, Catherine. 2013. "Explaining vocabulary in the second language classroom: A conversation analytic account". *Learning, Culture and Social Interaction* 2, 249-264.
- Weber, Elisabeth. 2016. Email to Thomas Finker, 17 April.
- Wei, Li. 2012. "Integration of ESP into EGP: The multidimensional and hybrid English training model in Liaoning Police Academy". *Theory and Practice in Language Studies* 2(9), 1877-1884.
- Welie, Jos V. 2004. "Is dentistry a profession? Part 1. Professionalism defined". *Professional Issues* 70(8), 529-532.
- West, Michael. 1953. *A General Service List of English words. With Semantic Frequencies and a Supplementary Word-List for the Writing of Popular Science and Technology*. London: Longman.
- Wharton, Susan M. 1999. "From postgraduate student to published writer: Discourse variation and development in TESOL". PhD thesis, University of Aston.
- Widdowson, Henry G. 1983. *Learning Purpose and Language Use*. Oxford: Oxford University Press.
- Xhaferi, Brikena. 2010. "Teaching and learning ESP vocabulary". *Revista de Linguas para Fines Específicos* 16, 229-255.
- Xie, Xiaoyan. 2013. "Vocabulary explanation in English-major university classrooms in China". *ELT Journal* 67(4), 435-445.
- Yule, George. 2014. *The Study of Language*. (5th edition). New York: Cambridge University Press.

Appendices

Appendix 1: Survey among teachers of ENFS

- 1) Worin besteht ein allfälliger Mehraufwand in der Vorbereitung von ENFS-Stunden (im Vgl. zur Vorbereitung herkömmlicher Englisch-Stunden) und warum?
- 2) Welche Aspekte stellen beim Lehren von ENFS eine Herausforderung dar?
- 3) Inwiefern äußert sich ein allfälliger Mehrwert des ENFS-Unterrichts gegenüber dem herkömmlichen Englischunterricht?
- 4) Welche Aspekte machen das Lehren von ENFS besonders interessant?

Appendix 2: ENFS-teaching materials

MMag. Elisabeth Weber

1



WORMS AT WORK

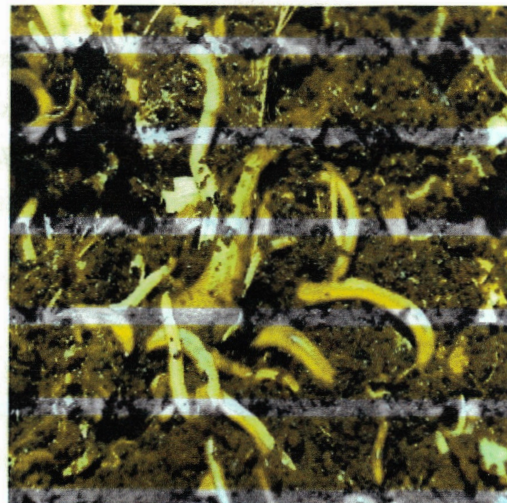
A worm compost bin is a real boon to gardeners, explains Pauline Pears, providing an efficient means to produce a steady supply of compost

During our rural past, food scraps were fed to the backyard pig or hens, who converted them into manure which could then be used in the growing of more food. These days, few households could practically keep pigs or hens, and kitchen scraps tend to be consigned to the dustbin, only to end up producing methane in a landfill site.

However, there is an alternative. You may not have space for a herd of pigs, but anyone could keep a flock, or is it a squirm, of worms which will fulfil the same recycling function to leave you with a source of rich compost.

In addition, worms require far less space, care and attention. They are quiet, odour-free and don't need a sitter when you go on holiday.

If you have neither the space nor the large quantities of organic matter which are required for a traditional compost heap, a worm compost bin really is ideal. This is because worm bins work best when supplied with small but regular quantities of compostable material and will happily function on a diet of kitchen scraps alone.



The unit can be tucked away in a shed, garage or even stored on a balcony and, if it is well managed, will not smell at all.

In time, you will be able to scoop off the top layer of worms and vegetable matter to reveal a rich dark worm compost which can be used in just the same way as traditional compost. It is particularly useful for top dressing containers and can also be mixed with ordinary potting compost to make it richer and more water retentive. Plastic worm bins, in particular, also produce a quantity of weak liquid feed which you can siphon off and use all around the garden and also on houseplants.

You can make a worm bin using a plastic dustbin, wooden box or something similar. All you need to do is drill drainage holes in the bottom, put in a layer of gravel to form a drainage sump, top it with planks of wood to stop the compost mixing in with the gravel, and you are ready to start.

Further information on how to build your own worm compost bin can be found on the internet. However, there are also a number of branded worm bins on the market that are perfect for beginners.

Beginners' starter kit

Worm bins are available on the internet and will arrive with everything you need to get started. The worms which work so hard on your behalf are usually brandling worms, also known as tiger worms or *Eisenia foetida*. These have a distinctive red banding, unlike common garden worms which will not do the job in these conditions.



Although they will soon multiply, to get the bin going quickly, you should start with as many worms as possible. It is best to use at least half a kilogram, which is about 500 – 1,000 worms.

Because the worms breathe through their skins, it is important that the contents of the bin are kept moist although, for the same reasons, the bin should be well drained enough not to be waterlogged.

When setting up the bin, you will need to give the worms somewhere to live and breed until they start producing compost. Shredded strips of newspaper, 2.5 – 5 cm wide, leafmould, garden compost, cardboard, or a mixture of these, are suitable. This bedding material should be moistened only to the point that when squeezed in your hand, little moisture appears between your fingers.

To keep your worms happy, the container should be dark inside and maintained at a fairly constant temperature somewhere between 18 – 25 °C. Worms can survive at considerably lower temperatures but won't be so active. Provided their home is suitable, they will not try to escape so you needn't worry too much about making your bin worm tight. Worms eat the micro-organisms that decompose vegetable matter. In other words, they are continually clearing up decaying vegetable waste, which is why a worm compost that is working well does not smell.

Once installed your worms can be fed on most cooked and uncooked food scraps, although you should avoid adding citrus peel in quantity as this can make the compost very acidic and, as a result, upset the worms. They will happily consume meat although, since this can attract flies, you may well prefer not to add it to your bin.



Food collection point

Simply collect food scraps in a closed container in the kitchen and empty it regularly into your worm bin. Do not add any liquid, and keep a scrunched up newspaper in the bottom of the container to absorb any excess liquid. If you have time, chop up large items to speed up the composting process.

In theory, about 500g of worms will process about 3 kg of food a week, which is said to be the typical quantity of kitchen waste produced by a family of four. In practice, it is safest to play it by ear. Don't expect a worm compost bin to deal with all your kitchen waste immediately.

The commonest cause of failure is overfeeding. It is all too easy to fill a worm bin with far more than the worms can eat, resulting in a stinking mess and dead worms.

To maintain an odour-free composting system, it is essential to start slowly while the number of worms builds up and you get to know the system. Begin by putting in no more than 1-2 litres of food, placing it in a heap on top of the bedding in one corner. Cover the surface with wet newspaper and leave undisturbed. After two to three weeks, check on the bin's progress. If the worms are now mixed up with the food put in another batch of food in a different spot. Then, resist the temptation to add more food to the bin until the worms have colonised this second batch.

You will rapidly get a feel for the process and may find that you can feed your worms several times a week in high summer, but much less frequently when temperatures drop. Above all, don't be concerned about under-feeding. A worm compost bin can survive for several weeks without additional food.

Hidden undesirables

Another thing you might like to try doing is burying the food scraps in the bedding material. Select a different site within the bin whenever you add fresh material. The advantage of this technique is that you don't have to look at either decaying food or worms.



However, the one disadvantage of this method is that it does make it more difficult to gauge when more food should be added.

Once your bin is up and running, each batch of waste should take six to eight weeks to be processed. Then, fine, dark compost will gradually build up in the bottom of your worm bin, underneath the layer of food. Small quantities can simply be removed with a trowel.

The alternative is to empty the container completely having first removed the top layer of partially decomposed food and worms which you will need to restart the bin. Late spring or summer is the best time to empty a container completely, as this allows a reasonable volume of compost to build up again by autumn.

Although the idea of a worm bin may be slightly off-putting or even alarming at first, once you have one up and running it will soon fit effortlessly into your routine. And the chance to turn rubbish into rich compost is surely one that no-one can afford to turn down.

Worm compost bin problems to look out for:



- If your bin begins to smell unpleasant, this means that the worms are not getting through their food quickly enough, either because you are feeding them too much or because conditions in the bin are not quite right.
- Plastic bins can become excessively moist, in which case you should try mixing in shredded newspaper to redress the balance. Conversely, other types of bin may have dried out and require additional watering.
- Tiny white, thread-like worms indicate that conditions are becoming too acidic. A handful of calcified seaweed can rectify this problem, particularly if moisture levels are adjusted at the same time.
- During the summer, minute black fruit flies may also become a problem. Although harmless, these can be very annoying. However, you should not use pesticides to control them. Instead, keep all food scraps covered within the bin, either by burying them or by topping with a good layer of shredded newspaper.
- As a short term control to the fruit fly problem, you can also use a vacuum cleaner to Hoover them up.





Whether they are decorative or medicinal, herbs are now gaining more attention from gardeners.

In botanical terms, a herb is any soft-stemmed plant that dies down at the end of the season, but gardeners often understand the term to mean one of a small group of aromatic plants with unique culinary, medicinal or cosmetic properties, subdued in appearance and grown together in a formally arranged herb garden.

Alternative medicines

The truth lies somewhere between these extremes, for in practice a herb is any plant with some part that is useful to man. In addition to the popular essential collection, sage, thyme, parsley and chives, often planted as kitchen garden accessories, there is an extensive range of other herbs, more commonly known by reputation than practical growing experience.

In the Middle Ages, before purely decorative gardening became fashionable, cultivated plants all had recognised uses, be they for dyeing, strewing on floors to scent the air or as treatments and cures that in many cases have since been discredited or superseded.

Current interest in more robust flavours and alternative medicines has revived the fortunes of plants that for years have been ignored or relegated to the flower garden. The full range of potential herbs includes aromatic or medicinal shrubs such as juniper, elder and Jerusalem sage, flowering plants as familiar as violets, mulleins and lily of the valley, and other species better known as wildflowers, vegetables or even weeds. These include coltsfoot, rhubarb, green alkanet and dandelion, for example.

All contain useful aromatic oils, distinctive flavours or less tangible therapeutic properties, and so qualify for inclusion in the complete herb garden. Since they have decorative merit, too, most herbs earn their place in the flower garden. Nasturtiums, bergamot, flax and pot marigolds contribute brilliant colours to contrast with the gentler shades of pink, mauve or white found in lavender or catmint. Some herbs have forms with silver, gold, coloured and variegated leaves, while the colourful mats and cushions of pennyroyal, thyme or marjoram, and the stately magnificence



of angelica, fennel and lovage add diversity of shape. Many are attractive to bees and other beneficial garden life.

While some gardeners prefer to mingle their herbs freely with other plants, large collections have traditionally been segregated in herb gardens, for together they have a visual unity while retaining sufficient variety of shape and size to create satisfyingly exclusive schemes. It is possible and effective to grow herbs with the freedom of a wild garden, but most herb gardens are formally laid out in symmetrical patterns, often divided by ornamental paths or hedges of lavender, rosemary, hyssop or germander. On a large scale, elaborate and ingenious knot gardens have been made entirely with herbs.



Planning and planting

The difficulty in designing a separate herb garden rests with the varied needs of herbs for soil and aspect. It is a mistake to assume that all prefer poor soil and full sun, although most shrubs, grey and silver varieties and species of Mediterranean origin thrive in these Spartan conditions. Annual herbs, on the other hand, like richer soil. Some such as dill, coriander and summer savoury need a warm site, whereas parsley prefers cool shade. Most mints, on the other hand, prefer consistently moist conditions.



A simple solution to this diversity is to collect sun-loving perennials in a formal garden on a site they enjoy, while growing annual herbs as part of the vegetable rotation. Remember when planning any herb collection that fragrance is an outstanding characteristic. Place the most appealing where they can be handled, picked, stepped on or brushed in passing to release their distinctive perfumes, and combine them with other scented plants such as old-fashioned roses or mock orange.

The majority of herbs can be grown in pots and other containers, a method that is particularly suitable for patios and courtyards, or where a basic collection needs to be accessible beside the kitchen door. Some tender herbs such as basil and lemon verbena are best grown as pot plants in our climate, standing them outdoors to take advantage of a warm summer.

Growing a few essential herbs in containers, including such hardy kinds as chives and parsley potted up early autumn, helps provide fresh supplies during winter. Mint and other invasive kinds can be restrained by planting them in large pots or bottomless buckets plunged in the ground.

Unless bought as growing plants, fresh supplies of annual and biennial herbs must be raised from seed. Many perennial kinds can also be started in this way, and herbs such as thyme, sage and marjoram are often more vigorous when grown from seed than from cuttings. All

variegated and named cultivars, however, must be propagated vegetatively, often every few years in order to keep plants vigorous and shapely.

Most herbs require little attention. Shrubs will need regular pruning, often immediately after flowering, to maintain their shape, and this may be combined with harvesting foliage for drying. Herbaceous perennial herbs benefit from division and replanting every few years.

Making use of herbs

Sometimes only certain parts of a herb may be useful. These are usually the leaves, but in some cases stems, flowers, seeds or roots can also be utilised. When you are gathering small quantities, consider the overall shape and health of plants, combining picking with light pruning or division. Wholesale harvest for storing needs to be done at the appropriate season, even at a certain time of day when flavours or medicinal properties are at their peak.



You should always check the ideal time, together with the best method of preserving the material, before harvesting your herbs. Most herbs are hung up to dry in a cool airy place and then stored in paper bags or air-tight containers.

Tasks:

- a) What is a herb? Give a definition.
- b) What were herbs used for in the Middle Ages?
- c) Why do you think herbs were ignored for such a long time?
- d) Why is there some sort of revival of herbs at the moment?
- e) What do you have to consider when designing a herb garden?
- f) Name some Mediterranean herbs and give information on conditions they need.
- g) Which herbs are ideal for being planted in pots? Why would you say they are?
- h) What is pruning and why do you have to prune some herbs?
- i) What can herbs be used for? Give examples.
- j) What does one have to know about storage of herbs?
- k) Think of several herbs that you would recommend for a small herb garden (looks, usage, price, ...)
- l) Choose two herbs and give information on them (200 words).
- m) Give advice on the needs of a typical Austrian herb selection.
- n) Design a modern herb know and be ready to present it professionally.

REDWOOD TREES

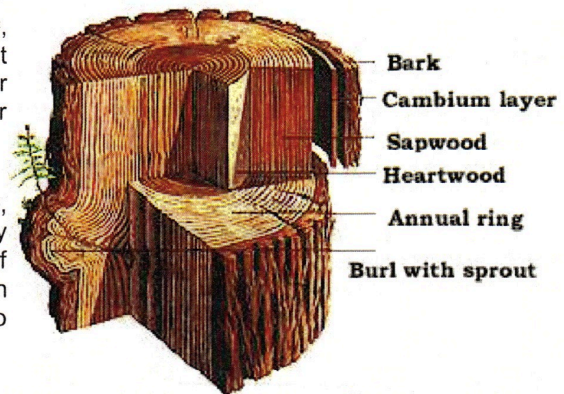
Superlatives abound when a person tries to describe old-growth redwoods: immense, ancient, stately, mysterious, and powerful. But the trees were not designed for easy assimilation into language. Their existence speaks for themselves, not in words, but rather in a soft-toned voice of patience and endurance.

From a seed no bigger than one from a tomato, California's coast redwood (*Sequoia sempervirens*) may grow to a height of 367 feet (122 m) and have a width of 22 feet (7 m) at its base. Imagine a 35-story skyscraper in your city and you have an inkling of the trees' ability to arouse humility.

Some visitors envision dinosaurs rumbling through these forests in bygone eras. It turns out that this is a perfectly natural thought. Fossil records have shown that relatives of today's coast redwoods thrived in the Jurassic Era 160 million years ago. And while the fantastic creatures of that age have long since disappeared, the redwoods continue to thrive, in the right environment.

California's North Coast provides the only such environment in the world. A combination of longitude, climate, and elevation limits the redwoods' range to a few hundred coastal miles. The cool, moist air created by the Pacific Ocean keeps the trees continually damp, even during summer droughts. These conditions have existed for some time, as the redwoods go back 20 million years in their present range.

The Redwood Tree



Growth Factors



Exactly *why* the redwoods grow so tall is a mystery. Theories continue to develop but proof remains elusive. The trees can reach ages of 2,000 years and regularly reach 600 years.

Resistance to natural enemies such as insects and fire are built-in features of a coast redwood. Diseases are virtually unknown and insect damage insignificant thanks to the high tannin content of the wood. Thick bark and foliage that rests high above the ground provides protection from all but the hottest fires.

The redwoods' unusual ability to regenerate also aids in their survival as a species. They do not rely solely upon sexual reproduction, as many other trees must. New sprouts may come directly from a stump or downed tree's root system as a clone. Basal burls, hard, knotty growths that form from dormant seedlings on a living tree, can sprout a new tree when the main trunk is damaged by fire, cutting, or toppling.

Undoubtedly the most important environmental influence upon the coast redwood is its own biotic community. The complex soils on the forest floor contribute not only to the redwoods' growth, but also to a verdant array of greenery, fungi, and other trees. A healthy redwood forest usually includes massive Douglas-firs, western hemlocks, tanoaks, madrones, and other trees. Among the ferns and leafy redwood sorrels, mosses and mushrooms help to regenerate the soils. And of course, the redwoods themselves eventually fall to the floor where they can be returned to the soil.

The coast redwood environment recycles naturally: because the 100-plus inches of annual rainfall leaves the soil with few nutrients, the trees rely on each other, living and dead for their vital nutrients. The trees need to decay naturally to fully participate in this cycle, so when logging occurs, the natural recycling is interrupted.



Understory

Many different shrubs populate the understory of old-growth redwood forests. Among them are berry bushes such as red and evergreen huckleberry, blackberry, salmonberry, and thimbleberry. Black bears and other inhabitants of the forest make use of these seasonal food sources.

Perhaps the most famous and spectacular member of the redwood understory is the brilliantly colored California rhododendron. In springtime, the rhododendrons transform the redwood forests into a dazzling display of purple and pink colors.



Role of Fog

Especially during summer, the North Coast is often gray with a thick layer of fog. When inland temperatures are high, the fog is drawn in from over the ocean. This natural cooling and moistening system is beneficial to the redwoods near the coast.

Fog precipitates onto the forest greenery and then drips to the forest floor, providing a small bit of moisture during summer dry periods. Although redwoods do not depend upon fog for their survival, their range would probably be reduced without it.



Root System

Aside from logging, the most frequent cause of death for mature redwoods is windthrow. The reason for this is that redwoods have no taproot. The roots only go down 10 to 13 feet (3-4 m) deep before spreading outward 60 to 80 feet (20-27 m).

Large redwoods move hundreds of gallons of water daily along their trunks from roots to crown. This water transpires into the atmosphere through the trees' foliage. Powered by the leaves' diffusion of water, water-to-water molecular bonds in the trees' sapwood drags the moisture upwards.

During the summer, this transpiration causes redwood stems to shrink and swell with the cycles of day and night.



Coast redwood

SEQUOIAS

COMPREHENSION QUESTIONS

1. When did the first white settlers come to the sequoia woods of California?
2. How tall can a sequoia grow?
3. How many feet can the diameter of a sequoia have?
4. What are the sequoias nicknamed?
5. What surroundings/climatic conditions do they need?
6. What type of soil do they need?
7. Which animals live in the sequoia woods?
8. Which other plants grow there?
9. How did the Native Americans use the sequoias?
10. How did the white people use the sequoias?
11. What are the pros and cons of controlled fires?

VOCABULARY

embedded	eingebettet
lumberman	Holzfäller
log	Baumstamm
grove	Wald, Hain
cone	Zapfen
pillar	Säule
lightening	Blitz
to become established	Fuß fassen



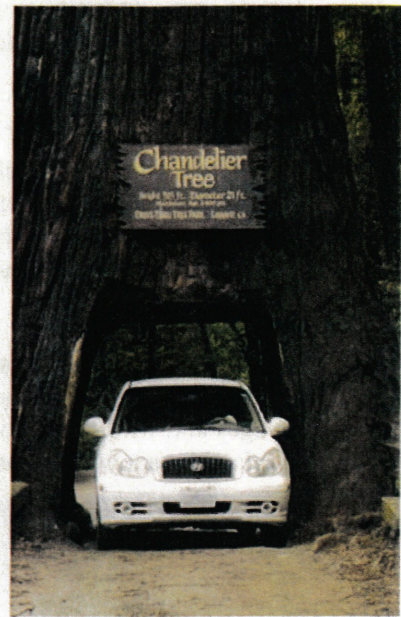
Plants of the Sequoia National Park

Extreme topographic differences and a striking elevation gradient (ranging from 412 m in the foothills to 4,417 m at the top) create a rich environment, from the hot, dry lowlands along the western boundary to the stark and snow-covered alpine high country.

This topographic diversity in turn supports over 1,200 species of plants, which make up dozens of unique plant communities. These include not only the renowned groves of massive giant sequoia, but also vast tracts of forests, spectacular alpine habitats, and oak woodlands.

The richness of the Sierran flora mirrors that of the state as a whole--of the nearly 6,000 species of plants known to occur in California, over 20% of them can be found within Sequoia and Kings Canyon National Parks.

Along the western edge of the parks, the Great Central Valley gives way to blue oak forest and a mosaic of other tree types. Unlike most of the park vegetation, which is made up of plant species native to the region, the foothill grassland is primarily non-native annual grasses that were introduced to California during the mid-19th century and have subsequently become naturalized. The slow-growing, gnarled blue oaks that dot this landscape can be hundreds of years old.



Dominated by dense thickets of sclerophyllous (thick-leaved) shrubs, chaparral (=Steineichenwald) is not a plant, but a type of plant community. Characteristic of lowland Mediterranean climates, it grows where winter rains provide most of the precipitation and, but for the hot dry summers, temperatures are relatively mild. Many chaparral species have specific adaptations to fire and drought, both of which have a strong influence on life in the foothill environment.



Unlike many of the cone-bearing, evergreen forests of the world, which are dominated by a single species of tree, the mixed-conifer forests that cloak the lower and middle slopes of the Sierra Nevada are remarkably diverse. Here pines, cedars, firs, and giant sequoias intermix and coexist. These trees, many of which reach tremendous heights, form some of the most extensive stands of old-growth coniferous forest that remain in the world.

In the upper mountains, the mixed coniferous forest is replaced by nearly pure stands of fir and pine. Characterized by deep snow accumulation during the winter months and a dense canopy that limits the amount of sunlight that reaches the forest floor, the fir forests lack a diverse herbaceous component. Only the most shade tolerant herbs thrive beneath the towering trees. Pines here have an unusual distribution, growing in both moist lowlands and in drier sites on benches and ridges. In wetter sites, these forests can support a rich amalgam of herbs and wildflowers in their understory.



Above the upper-most edge of the montane forests, subalpine woodlands define the limit of tree life in the Sierra. In Sequoia National Park, these include the southernmost populations of foxtail pine, a close relative of long-lived pines which can be found in the White Mountains to the east. Downed pieces of foxtail wood can persist intact for thousands of years, preserved by the extremely cold and dry conditions that characterize the high elevations.

Where soils are too saturated or shallow to support tree growth, numerous meadows can be found in the montane, subalpine and alpine zones. Wet meadows support a remarkably diverse assemblage of grasses, sedges and wildflowers, which provide essential habitat for many small mammals, birds, and insects. Dryland meadows, too, are an important source of food and shelter for animals of the higher elevations.



In the rocky alpine, where the short growing season and harsh winter conditions exclude all but the hardiest of plants, stunted trees give way to low-growing, perennial herbs. Here plants often form ground-hugging mats or hummocks to take advantage of the warmer surface temperatures. In winter, the snowpack provides insulation from sub-freezing temperatures and desiccating winds. During the brief summer, when freezing temperatures and snowstorms remain a threat, surprisingly showy flowers burst forth in the race to set seed before winter returns.

The parks' vegetation management programs focus on understanding the parks' flora and vegetation, protecting rare species, restoring natural fire regimes to forest and chaparral ecosystems, monitoring and controlling invasive non-native (exotic) plants, restoring disturbed habitats and landscapes, and monitoring and managing impacts from recreational and administrative uses.

Role Play

Scenario

A privately owner forest containing a grove of sequoia trees is at risk of logging. Each character has a different idea of how best to utilize the sequoia trees. Present your suggestion with supporting facts.

Characters

Land Owner: You are concerned first and for most with profit. You want to log the forest over the next 20 years, but you are also open to another use for your land. Ask questions to determine the most profitable and sustainable use for your land!

Save-the-Redwoods Activist: You are concerned with the preservation of the sequoia tree grove at all cost! Your job is to convince the **Land Owner** to save these trees. You would also like the land to remain untouched in its natural state.

Arborist: You are the source of information for forestry and management techniques of sequoia trees. You want to protect the grove from logging and convince the **Land Owner** to allow you to use the tree for your research.

State Forest Ranger: You work in the Sequoia National Park. You are familiar with the potential success of another public park containing sequoia trees. You want to convince the **Land Owner** to sell his land to the state of California in order to create a new State Park for the protection of these trees, as well as enhance tourism.

Appendix 3: Transcription conventions for HBLFA transcripts

Based on the conventions used in:

Smit, Ute. 2010. *English as a Lingua Franca in Higher Education: A Longitudinal Study of Classroom Discourse*. Berlin: Mouton de Gruyter.

Waring, Hansun Z.; Creider, Sarah Ch.; DiFelice Box, Catherine. 2013. "Explaining vocabulary in the second language classroom: A conversation analytic account". *Learning, Culture and Social Interaction* 2, 249-264.

(.)	Pause shorter than a second
(1), (2),...	Timed perceptible pause within a turn (in seconds)
.	Sentence-final falling intonation
,	Phrase-final intonation (more to come)
?	Rising intonation
-	Abrupt cutting off of sound
:	Lengthened vowel sound
=	Latch
[Overlapped talk
CAPITALS	Stressed words or syllables
<GERMAN> Text </GERMAN>	German words or expressions
<READING> Text </READING>	Text being read aloud
<QUOTATIVE> Text </QUOTATIVE>	Text being quoted from teaching material
<SOFT> Text </SOFT>	Spoken in a soft voice
<SLOW> Text </SLOW>	Spoken comparatively slower
(xx)	Unclear speech (one 'x' per syllable)
(Ss raise their arms)	Added explanations
b[i:]r, p[e]r	Illustrating pronunciation
@	Laughter
T	Teacher
Sf4	Female student (number according to seating chart)
Sm7	Male student (number according to seating chart)
SmX	Unidentified male learner
SfX	Unidentified female learner
Ss	Several students speaking at the same time

Appendix 4: Abstracts

Summary

English for Specific Purposes (ESP) remarkably aims at teaching vocabulary that meets the learners' current or future professional needs. Taking this central role of lexis as the starting point, this thesis explores the didactic principles that underlie the teaching of horticultural English vocabulary to prospective landscape designers. While the first part of the thesis provides a comprehensive account of ESP, its tradition, implementations, and teacher profile, the empirical part tackles the research questions. In particular, this research (a) investigates the degree of lexical technicality in teaching materials dealing with horticultural topics such as redwood trees or herbs and (b) describes the structures and strategies of vocabulary explanations in the classroom discourse. As regards the methods, the analyses of the reading texts are carried out by the two readability formulas Flesch-Reading-Ease and Flesch-Kincaid-Grade-Level, which consider the texts' general syntactic patterns and prognosticate specific levels of reading abilities. Furthermore, the overall proportions of general, academic, and technical English words are determined via the vocab profiler of Lextutor in order to reveal the thematic level of specificity with regard to the field of horticulture. The transcribed classroom discourse is analyzed according to analytic, i.e. language-driven, and animated, i.e. illustrating, strategies such as the use of definitions or sample sentences and the application of gestures or blackboard drawings. The results show that the teaching materials differ in terms of their affiliation with the field of horticulture. While one reading text serves as an introduction to the language of gardening, another text gives considerable exposure to specialist botanical and agricultural terms. These findings demonstrate how carefully ESP teaching materials need to be analyzed and selected in order to familiarize ESP learners with comprehensible, discipline-specific language input. Concerning the vocabulary explanations, a great preponderance of analytic strategies is identified, with definitions and synonyms being the most frequent explanatory strategies. Moreover, the explanations are found to feature an explicit interactive approach with the students being actively involved in guessing and discussing the meanings of words and the teacher launching the dialogues, encouraging participation, and checking comprehension. All in all, individual explanation-sequences can serve as examples of good practice with regard to classroom interactional competence and the teaching of discipline-specific vocabulary in a language-rich and interactive classroom setting.

Zusammenfassung

Englisch für spezielle Zwecke (*English for Specific Purposes – ESP*) zielt besonders auf die Lehre von Vokabular ab, das den gegenwärtigen oder zukünftigen beruflichen Anforderungen der Lernenden entspricht. Diesen wichtigen Status von Lexik als Ausgangspunkt nehmend, untersucht diese Diplomarbeit die didaktischen Prinzipien, die der Lehre gartenbaulichen Englisch-Vokabulars zugrunde liegen. Während der erste Teil der Arbeit ein umfassendes Bild von ESP, dessen Tradition, Umsetzungen und LehrerInnenprofil skizziert, fokussiert der empirische Teil auf die Forschungsfragen. Im Detail untersucht diese Forschungsarbeit (a) das Ausmaß lexikalischen fachsprachlichen Charakters in Lehrmaterialien, die gartenbauliche Themen wie Mammutbäume oder Heilkräuter behandeln, und (b) beschreibt die Strukturen und Strategien von Vokabelerklärungen im Klassendiskurs. Hinsichtlich der Methoden werden die Textanalysen mittels der zwei Lesbarkeitsindizes Flesch-Reading-Ease und Flesch-Kincaid-Grade-Level durchgeführt, welche die gesamten syntaktischen Strukturen der Texte berücksichtigen und spezifische Levels der Lesefähigkeit prognostizieren. Ferner werden die vollständigen Anteile an generellen, akademischen und technischen englischen Wörtern mithilfe des Vokabelanalytikers von Lextutor bestimmt um das Ausmaß thematischer Spezifität mit Bezug zum Gartenbau aufzuzeigen. Der transkribierte Unterrichtsdiskurs wird entsprechend analytischer, d.h. sprachbasierter, und animierter, d.h. veranschaulichender, Strategien analysiert, wie etwa die Verwendung von Definitionen oder Beispielsätzen sowie der Einsatz von Gesten oder Tafelbildern. Die Ergebnisse zeigen, dass das Lehrmaterial sich im Ausmaß seiner Zugehörigkeit zur Disziplin des Gartenbaus unterscheidet. Während ein Text als Einführung in die Sprache des Gärtners fungiert, offeriert ein anderer Text erhebliche Beschäftigung mit spezialisierten botanischen und landwirtschaftlichen Begriffen. Diese Ergebnisse demonstrieren die Wichtigkeit der sorgfältigen Analyse und Auswahl von ESP-Lehrmaterialien um ESP-Lernende mit nachvollziehbarem, disziplinspezifischem Spracheinsatz vertraut zu machen. Bezüglich der Vokabelerklärungen wird eine große Mehrheit an analytischen Strategien aufgezeigt, innerhalb derer Definitionen und Synonyme die häufigsten erklärenden Strategien darstellen. Ferner weisen diese Erklärungen einen explizit interaktiven Zugang auf, bei dem die SchülerInnen im Raten und Diskutieren der Bedeutungen von Wörtern aktiv involviert sind und die Lehrperson die Dialoge initiiert, die Mitarbeit fördert und das Verständnis kontrolliert. Insgesamt können einzelne Erklärungssequenzen als Beispiele guter Praxis bezüglich der klassenraum-interaktionellen Kompetenz sowie der Lehre disziplinspezifischen Vokabulars in einem sprachreichen und interaktiven Umfeld im Klassenraum dienen.