ESP coursebook design: Issues to consider and design-based research as an effective solution

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This paper provides a conceptual framework for ESP (English for Special Purposes) coursebook design that can help ESP teachers, who often have to either adapt existing learning materials or design their own learning materials. Despite a large number of ESP coursebooks for different courses and fields of study available on the market, it is still rare to find those which meet both the students' needs and the particular course requirements. Every learning or teaching situation is unique and influenced by such factors as the constraints imposed by syllabuses, the dynamics of the classroom, and the expectations and motivations of the students. Since no comprehensive concept of ESP coursebook design has yet been published, the purpose of this paper is to discuss, analyse, and consolidate different approaches to coursebook design, particularly with regard to SLA theories. In addition, the paper suggests design-based research as a suitable method for ESP coursebook design. One of the fundamental characteristics of the design-based research is its two-fold yield: apart from developing a research-based intervention as a solution to an educational problem, it leads to the development of the theories on which the intervention is based. The two-fold yield of ESP coursebook design-based research thus results in a product, in this case an ESP coursebook, that is both usable and effective and in design principles that contribute to the development of theories of ESP coursebook design.

Keywords: *authenticity, ESP coursebooks, carrier content, design-based research, skill-based activities, task-based activities*

1. INTRODUCTION

ESP (English for Special Purposes) plays an important role, especially at universities, and one of its key topics is the design, analysis, and evaluation of coursebooks. For this reason, ESP places relatively high demands on teachers to analyse the needs of their target group of students, to design or modify coursebooks to meet their specific needs, and to deal with the specialist subject matter and the characteristic features of the professional language. As Hyland (2006, p. 89) observes, ESP coursebooks form the interface between teaching and learning, in which needs, goals, and syllabi materialize for both teachers and students. Coursebooks therefore play a crucial role in ESP teaching and learning, and their design is a fundamental aspect here. Hutchinson and Waters (1987, p. 106) agree that, compared with general English teachers, most of ESP teachers' time is occupied with designing learning materials, and they also mention that publishers are naturally reluctant to publish ESP coursebooks due to the very limited and specific demand for them.

Unlike general English coursebooks, whose abundance is significantly influenced by the fact that they are a commodity that brings publishers significant profit on the international market, ESP coursebooks, particularly those aimed at more specialized fields of study (e.g., information technology, analytical chemistry, bioengineering, agricultural, and forestry engineering), are not lucrative enough for publishers. Esteban (2002, p. 40) explains that if each ESP course must have some defining characteristics that cannot be easily transferred to a different teaching-learning situation, including coursebooks, the decisive factor for both the authors and the publishers is to fill the gap in a specific field of the publishing market, while the authors alone focus on this gap mainly in terms of the number of people that have the same needs. According to Esteban, the result of this is that many ESP coursebooks hide general English coursebooks under their titles. Therefore, it is quite common for teachers to design in-house coursebooks that can be published and distributed to other institutions, but which in most cases are intended specifically for teachers and students of the home institution. Hutchinson and Waters (1987) and Barnard and Zemach (2014) point out that very few teachers are trained in coursebook design methodology and that, even though one can teach, this does not necessarily mean that one can write coursebooks. On the other hand, they do recognize that the process of designing coursebooks raises teachers' awareness of what all language teaching and learning involves.

Since no comprehensive study of ESP coursebook design has been published yet, the purpose of this article is to discuss, analyse, and consolidate different approaches to coursebook design based on theories of second language acquisition (SLA) and ESP teaching and learning. In addition, design-based research (DBR) is discussed here as a suitable method for ESP coursebook design. DBR was developed as a way of conducting formative research to test and refine educational designs based on theoretical principles derived from previous research. This approach of "progressive refinement" in design involves putting an initial version of a design into practice and monitoring how it works (Collins, Joseph & Bielaczyc, 2004, pp. 18–19). Through this process, the design is gradually modified based on experience until all the defects are eliminated. By examining a design in practice for the purpose of progressive refinement, it is possible to develop more sophisticated designs over time, the systematic evaluation of which simultaneously leads to the development and enrichment of existing theoretical principles. A major benefit of DBR is the dual goal of refining both theory and practice. Thus, the theoretical and methodological concepts in this study should allow ESP teachers to contemplate how to conduct DBR on their own coursebooks and learning materials.

2. THE CONCEPT OF ESP COURSEBOOK DESIGN

When designing a coursebook, it is necessary to focus on many different aspects. The main features of quality coursebooks, such as content, comprehensibility, good structure, interesting topics, visual aids, and sufficient activities and problem tasks, are based on different functions of the coursebook (motivational, informational, systematic, guiding, differential, etc.) the fulfilment of which should be carefully evaluated (Mikk, 2007, p. 15). According to Tomlinson (2010, p. 82), coursebooks for second language teaching should not be crafty clones of previously successful coursebooks; rather, they should be methodological and consistent applications of (1) SLA theories, (2) teaching methods and approaches, (3) our current knowledge of how the target language is actually used, and (4) the results of systematic evaluation of learning materials and observation of their use in classrooms.

Following Tomlinson's recommendations, Timmis (2014, pp. 252–257) defines five methodological principles based on SLA theories and communication approach, which authors should follow when designing coursebooks. The syllabus in a course of learning materials should be text-driven;

therefore, the starting point should be a variety of authentic texts that are meaningful and interesting for students and ensure their active involvement in learning. Texts should be used as a basis for language work on selected lexical, grammatical, or discourse features, thus enabling students to better understand the purpose of using the language. Tasks that facilitate comprehension should precede text analysis tasks, which encourages the student to make a personal response to the text before focusing on language features. Language work should also reflect what we know about its nature. Timmis also emphasizes the inclusion of lexical elements (collocations, fixed phrases) and how individual words behave grammatically. His last methodological principle is that language tasks should focus on discovery and noticing rather than production, which consists of mechanical manipulation and repetition.

ESP coursebooks may differ slightly from general English coursebooks. First, they are likely to be designed for students whose language level is B1 (according to CEFR) and higher. They also focus on aspects of English related to the field of study. Moreover, they may differ from general English coursebooks in their emphasis on the representation of skills, as some ESP courses place more emphasis on the written form of the language and others focus on presentation skills. According to Richards and Rodgers (1986, p. 25), ESP coursebooks should be based on a functional/communicative methodology but should also (1) focus on communicative abilities of interpretation, expression, and negotiation; (2) focus on understandable, relevant, and interesting exchanges of information, rather than on the presentation of grammatical form; (3) involve different kinds of texts and different media, which students can use to develop their competence through a variety of different activities and tasks. The other important features of ESP coursebooks, as Cunningsworth (1995, p. 134) notes, include flexibility and a modular design, with separate self-contained units, thus allowing students to study individually, cover the ground of any lessons missed, and focus on that content which is relevant to their needs.

2.1. The application of SLA theories to ESP coursebook design

In the process of designing an ESP coursebook, it is necessary to consider the factors that arise from SLA theories. This chapter provides a conceptual framework for designing ESP coursebooks from the perspective of those theories.

2.1.1. ESP coursebooks should expose students to rich, meaningful, comprehensible and authentic language input

If a coursebook positively influences students, stimulates their interest, and attracts their attention, it is more likely that a second language will be acquired successfully. Students need to gain experience not only by perceiving how language is typically used, but also by using it for communication. ESP coursebooks should expose students to authentic input (see, e.g., Brown & Yule, 1983; Dudley-Evans & St John, 1998; Timmis, 2014; Tomlinson, 2010, 2011; Velazquez & Redmond, 2007) through the instructions for their activities and the texts they contain (e.g., authentic listening to the promotion of the latest product, reading an expert review of a particular product). Krashen's (1982, p. 21) input hypothesis suggests that the input language stimulus should be comprehensible and only slightly above the current language level of students to facilitate second language acquisition. For ESP coursebooks, this means that all language stimuli (texts and tasks including audio and video) must reflect both the language and the professional level of students so that they can learn the target language naturally and quickly.

ESP coursebooks should also expose students to authentic input through modified interaction, which supports the second language acquisition and is a necessary mechanism for ensuring comprehensible input through students' mutual interaction in the target language and their cooperation leading to mutual understanding (Long, 1983, p. 102). Through modified interaction (e.g., role-playing a job interview, simulating a workshop in which individual participants are assigned different roles, information gap tasks, a guided debate) requiring the use of different communication strategies, the participants in the conversation try to make their language input comprehensible, as this is the only way for the conversation to continue.

Connectionism emphasizes that students are often exposed to many specific language structures. If students repeatedly hear or read these structures in a particular situational or linguistic context, they will form a strong network of connections between individual elements (Lightbown & Spada, 2006, p. 28). Authentic materials contain such structures, so authentic language input must be rich and varied. In other words, it should vary in style, manner, means and purpose, and should also contain many characteristic structures of authentic discourse in the target language. The discourse should be planned and unplanned – e.g., in the form of professional lectures, informal interviews, and spontaneous discussions. ESP coursebooks should encourage students to interact with the language input rather than receive it passively. This does not necessarily mean that students will always

produce language in response to input, but they should be led to a certain mental or physical activity.

According to Tomlinson (2010, 2011), authors of coursebooks should include texts of different genres and styles related to the topics, events, and places that are relevant and meaningful to the target group of students. They should ensure that texts are authentic in the sense that they represent how the language is typically used in a particular situation, situate language input into the given context, and expose students to examples of authentic language, thus providing them with natural repetition of language elements and structures.

2.1.2. ESP coursebooks should provide students with opportunities to use the target language to achieve communication objectives

The use of language for communication lies in achieving communication goals in a situation in which the content, strategy, and method of interaction are determined by students. Second language acquisition presupposes the unconscious mastery of a language through direct immersion into a second-language environment and the use of the language in a real communication situation (Krashen, 1982, pp. 163–164). The tasks in ESP coursebooks should allow students to use the language in the same way as in real communication situations. In her comprehensible output hypothesis, Swain (1985, p. 252) points out that students do not demonstrate the productive competence of native speakers because of the limitations of intelligible input, but rather because their intelligible output is limited. If ESP coursebooks provide students with ample opportunities to use the target language to achieve communication goals, it will allow them to verify the effectiveness of their internal assumptions, especially if they are pushed slightly beyond their existing language proficiency by engaging in tasks and activities that are stimulating and arguable, but at the same time achievable.

Authors of ESP coursebooks should design output tasks and activities so that students use the language actively and communicate fluently, accurately, appropriately, and effectively. The output activities should be set in a specific context in which students respond to an authentic stimulus with a clear intention in mind, and they should also provide students with feedback opportunities (Tomlinson, 2010, p. 83). An example can be warm-up activities at the beginning of each unit in which students are supposed to discuss different issues related to the content of the unit. ESP coursebooks should also provide space for topics and tasks that students may identify with – e.g., tasks aimed at discussing the latest topics from their field of study.

2.1.3. ESP coursebooks should engage students both cognitively and affectively

Tomlinson (2010, p. 90) states that coursebooks should allow students to pay attention to features of authentic input through affective and cognitive engagement when working with text. The cognitive learning theory is based on the idea that students will actively think about what they are learning, which must be preceded by a motivational factor – students' emotional engagement is necessary for stimulating the cognitive process. Krashen's (1982, pp. 30–32) affective filter hypothesis suggests that a large amount of intelligible input does not guarantee successful second language acquisition. An impenetrable emotional filter, which consists of low motivation, low self-esteem and high anxiety, intensively blocks second language learning and acquisition. Tomlinson (2010, p. 89) emphasizes that "feeling enjoyment, pleasure and happiness, feeling empathy, being amused, being excited and being stimulated are most likely to influence acquisition positively but feeling annoyance, anger, fear, opposition and sadness is more useful than feeling nothing at all". Tomlinson further adds that students should use the same mental capacities that they use when learning and using their mother tongue, i.e. use imagination, inner speech, emotional responses, predictions and personal interpretations.

In the case of ESP coursebooks, it should not be too difficult to convince students that selected texts and tasks are relevant to the field of their study, but language input and output should always be set in context. This can be facilitated through in-class debates about controversial topics related to students' field of study that encourage students to express their feelings or through role-plays of real-life situations. ESP coursebooks can stimulate students effectively and cognitively through interesting texts and visual material accompanied by thought-provoking tasks that encourage students to use their imagination, inner speech, emotional responses, and personal interpretations.

2.1.4. ESP coursebooks should expose students to salient language features

According to the noticing hypothesis (Schmidt, 1990), an important starting point for second language acquisition is to repeatedly expose students to second language structures that stand out in some way, are different from what students expect, or fill a gap in their knowledge of the language. Tomlinson (2011, p. 15) claims that it is important for students to "become aware of a gap between a particular feature of their interlanguage (i.e. how

they currently understand or use it) and the equivalent feature in the target language". Seliger (1979, p. 368) calls the process of noticing the gap between input and output an "acquisition facilitator". If ESP coursebooks allow students to pay attention, either consciously or unconsciously, to the language features of authentic input, they will eventually allow them to master these features. For example, students of English for information technology who consciously pay attention to the advantages and disadvantages of different types of computers while listening may at the same time unknowingly pay attention to language functions related to classification, and conversely, by consciously focusing on the language means used for classification, may unknowingly gain information about the advantages and disadvantages of different types of computers.

ESP coursebooks should include elements focused on observational activities and discovery through an experimental approach in which students first undergo a certain experience that holistically engages them through the so-called "deep-end strategy" (Brumfit, 1978, pp. 27–30), which requires performance as its starting point. From such experience, students learn implicitly without conscious attention to the particular language features of a given spoken or written text and explicitly by providing information about its use. ESP coursebooks should also enable students (ideally using pair or group work) to discover by means of case studies, task-based teaching, simulation, or other methods.

2.1.5. Authors of ESP coursebooks should consider the different learning styles of students

Tasks and activities in ESP coursebooks should be varied and ideally suited to all learning styles. An analysis of current coursebooks (Tomlinson, 2011) shows a tendency to favour students with "studial" learning styles, who prefer explicit grammar teaching and focus on language accuracy over those with an "experiential" learning style who prefer learning through discovery. It is assumed that all students benefit from a studial learning style, which is confirmed by Tomlinson' findings based on international testing of foreign languages in formal education according to which students with this learning style, who are actually a minority, are at an advantage.

Learning styles that should be considered when designing ESP coursebooks include visual, auditory, kinaesthetic, studial, experiential, analytical, global, dependent, and independent (for more detail see Tomlinson, 2011, p. 18). Ellis (1994, p. 508) emphasizes that it is important for the authors of coursebooks to consider the differences between preferred learning styles and not to expect

all students to benefit from the same approaches as a "good language learner" who learns according to a certain generally applicable formula.

2.2. The content and authenticity of coursebooks

The choice of suitable learning materials significantly affects the motivation of students. Students may be demotivated if they are already too familiar with a certain topic from their field of study, and therefore, the thematic content of their ESP course should be processed somewhat differently from the specialist subject of their degree course. On the other hand, students may have trouble dealing with a completely unknown topic. Dudley-Evans and St John (1998, p. 45) propose the selection of topics that are parallel to the subject, but not entirely part of it – in other words, discipline-specific topics that are not included in its syllabus. Students who need English for communication in their profession will not be satisfied with an ESP course if its content does not deal with the issues of the profession. On the other hand, students who study ESP because it is included in their study programme or attend an ESP course based on their employer's requirements and who do not have specific, immediate, and clearly defined needs may be demotivated by a course whose focus is too specific. Therefore, it is necessary to take all these facts into account when designing an ESP coursebook.

When addressing the specificity of learning materials, an important aspect of ESP is to specify the function of the content of each lesson. Any learning activity in ESP, whether focused on linguistic means or language skills, is presented in a specific context. Dudley-Evans and St John (1998, pp. 11–12) define two concepts necessary for understanding the role of content: "carrier content" and "real content". Carrier content refers to the subject matter; it is typically an authentic topic that can be used as a means for teaching real content, which includes all components of communication competence in a given context. An example can be a text focused on individual types of computers (carrier content) and a task in which students use language as a means to compare types of computers (real content). Carrier content has a motivating function because in this case, ESP students specialised in computer science are already familiar with this topic, so it will not influence the main objective of the task – the language associated with comparison. However, to maintain motivation, it is important to include more professional content.

An important question when designing ESP coursebooks is whether to use authentic or modified materials. The exact meaning of the term "au-

thenticity" often seems unclear. Modified or adapted texts are passages or tasks that usually emphasize a specific language feature, while authentic texts are written by native speakers and published in contexts designed specifically for native-speaker consumption regardless of non-native accessibility. The topics, language, syntax, and structure are targeted at native speakers and offered through media intended primarily for native speakers (Lansford, 2014). Authentic materials that are not primarily intended for language teaching (e.g., information brochures, technical manuals, scientific articles, coursebooks of specialized subjects, educational videos) have great motivational potential for ESP students because not only do they help them develop their language skills, but they also provide representative examples from real life. Nevertheless, their use in ESP courses has been the subject of many discussions and research (Benavent & Peñamaría, 2011; Canale & Swain, 1980; Gilmore, 2007; Lansford, 2014; Lee, 1995; MacDonald, Badger & Dasli, 2006; Velazquez & Redmond, 2007; Widdowson, 1978, 1998). Although, on the one hand, the use of authentic materials in ESP is encouraged, there are objections that the mere presence of authentic texts does not guarantee the authenticity of the purpose of their use. Philips and Shettlesworth (1978, as cited in Duddley-Evans & St John, 1998, p. 28) argue that students need to be exposed to authentic texts and develop skills and techniques for reading long and complex texts so that they can gain independence in their learning strategies. In contrast, Hutchinson and Waters (1987) argue that the concept of an authentic text does not exist in principle because the text is automatically removed from its original context. It is therefore more important to ask the question of what role the text will play in the learning process and whether it is practically usable for the set learning objective. Authenticity lies in the nature of the interaction between the text and the reader (Widdowson, 1978, p. 80). It cannot be achieved if students do not respond to the texts in the same way as native speakers in real contexts, or if authentic tasks are not in line with their field of study. Velazquez & Redmond (2007) and Brown & Yule (1983) recommend that teachers focus on the use of authentic materials and their interesting processing rather than on authentic materials themselves. Dudley-Evans and St John (1998, p. 136) also confirm that the authenticity of "the purpose of a text is as important as the authenticity of the text itself," which is especially important when working with real content and carrier content.

It follows from the above discussion that the question of authenticity concerns not only texts but also other aspects which, according to MacDonald et al. (2006, p. 250), include competence authenticity, learner authenticity,

and classroom authenticity. Competence authenticity lies in the student's ability to communicate in another language corresponding with "interactions which take place between idealised native speakers or between native and non-native speakers" (MacDonald et al., 2006, p. 252). Learner authenticity concerns the interaction between the user of the language, their purpose, the communication situation in which the text is used, and the sample text itself (see also Lee, 1995). It is defined as the student's positive reaction to the text and the educational intention it contains, which is evoked more by the communicative potential of the text than by its authenticity. The concepts of competence authenticity and student authenticity imply that, if students have the appropriate learning material and instructions on how to interpret the meaning of the text, they are able to share their knowledge with native speakers. The final category, classroom authenticity, arises from the conditions created in a class. Belcher (2012, p. 9) recommends enhancing the authenticity of the classroom through their engagement in "collaborative solving of typical field-specific problems, simulated or actually occurring". These activities prepare students to function in target communities by equipping them with language-learning and problem-solving strategies.

3. DESIGN-BASED RESEARCH AS AN EFFECTIVE APPROACH TO ESP COURSEBOOK DESIGN

ESP teachers often need to evaluate, edit, and design their own coursebooks and learning materials to best suit the students' needs and the course they attend. Even though the general principles for ESP coursebook design are the same as the principles for general English coursebook design, ESP places more emphasis on developing specific skills and learning strategies applied in the context of ESP through "skill-based activities and task-based activities involving an element of problem-solving and drawing substantially for their content on the learners' specialist subject knowledge and professional experience" (Cunningsworth, 1995, p. 134). The design of quality ESP coursebooks should draw on a combination of approaches that are also applied in general English teaching, focusing on a genre mediated by texts representing the professional orientation of students, the development of receptive and productive skills, activities that ensure the coherence of language and context, and tasks that students solve through exemplary communication activities that would take place in their real professional environment. The author of an ESP coursebook should also provide sufficient space for the coursebook's flexibility and ad-

aptability, ensure that students acquire transferable skills, and enable teachers to further adapt and expand it according to current needs. The design of an ESP coursebook tailored to a target group of students should provide a teacher-author with the opportunity to appropriately select and organize texts, vocabulary, language functions and activities, and design tasks that will simulate real professional situations.

One of the effective approaches to ESP coursebook design can be design-based research (DBR) (see, e.g., Amiel & Reeves, 2008; Anderson & Shattuck, 2011; Bakker & Van Eerde, 2013; Barab & Squire, 2004; Pardo-Ballester & Rodríguez, 2009; Štemberger & Cencič, 2014; Van der Akker, 2006), a relatively new research methodology that emerged at the beginning of the twenty-first century. Thanks to DBR, an ESP teacher can gain experience with the research itself through a dual role of researcher and practitioner. For ESP teachers who design their own learning materials, research is necessary not only in the field of needs analysis but also in the ongoing evaluation and gradual improvement of the material used in lessons. DBR is always situated in a real educational context, which provides authors of ESP coursebooks with immediate feedback about their quality, lends "a sense of validity to the research and ensures that the results can be effectively used to assess, inform, and improve practice in at least this one (and likely other) context" (Anderson & Shattuck, 2012, p. 16).

3.1. Collaboration and mixed methods in ESP coursebook design-based research

Despite stressing the prominent role of teachers in ESP materials development (e.g. Basturkmen, 2010; Bocanegra-Vale, 2018; Dudley-Evans & St John, 1998; Marjanovikj-Apostolovski, 2019; Ruzhekova-Rogozherova, 2018), in DBR of ESP coursebooks, students have an equal or even more decisive role than teachers, particularly regarding the selection of carrier content, which goes hand-in-hand with the learner-centred approach typical of ESP teaching and learning. Moreover, the emphasis on effective collaboration in DBR involves active participation of not only ESP teachers and students, but also other stakeholders, such as ESP researchers, materials development experts, specialised subject teachers, and potential employers.

The focus on collaboration as well as the use of mixed methods (both qualitative and quantitative) in ESP coursebook development is especially important during the ESP coursebook evaluation stage in DBR. Vičič (2011, p.

116) evaluates her coursebook for English in logistics using a questionnaire survey in three stages: (1) materials evaluation by teachers or other stakeholders (e.g., potential employers) before their implementation, (2) materials evaluation by teachers during their implementation in lessons, and (3) materials evaluation by students at the end of the course. Martala (2003) uses a set of five questionnaires to evaluate her ESP course. The first questionnaire was presented to students at the beginning of the course, three more were given at the end of each month to find out their views on what they had learnt, and the last one required students to rate the course based on their experience as postgraduate degree students. Basturkmen (2010, p. 84) suggests that external evaluation of ESP learning materials through feedback from the employers of the university graduates plays an important role. Such feedback can reveal whether the graduates perform effectively in their workplaces regarding their language and communication skills. Atherton (2006, pp. 16–17) recommends the use of mixed methods for evaluating ESP learning materials. These methods include comparing students' results on entry and exit tests, a questionnaire at the end of the course, based on students' assessment of achieving the main objectives of the course, and a so-called "acid test" sent to the students a few months after they had finished the particular ESP course when they can better assess the extent to which they have mastered the course, based on their experience of using the English language in practice. The qualitative methods that the DBR of an ESP coursebook involves are teachers' diaries reflecting on their use of the coursebook, observation of the coursebook's use in lessons, and interviews with teachers, students, and potential employers about the coursebook's quality. All these aspects should be included in DBR of ESP coursebooks with an emphasis on its intensive and long-term character (McKenney, Nieveen & Van den Akker, 2006; Reeves, 2006; Reeves, Herrington & Oliver, 2004).

3.2. The iterative and cyclical character of ESP coursebook design-based research

DBR is also cyclical in character: "analysis, design, evaluation and revision activities are iterated until an appropriate balance between ideals ('the intended') and realization has been achieved" (Plomp & Nieven, 2013, p. 17). While most methodological principles of ESP coursebook development describe a linear process progressing from one stage to another, involving needs analysis, the design of texts and tasks, piloting, revising, and final production (see, e.g., Dudley-Evans & St John, 1998; Hutchinson & Waters, 1987; Iswati, 2019; Ruzhekova-Rogozherova, 2018; Srimukti, 2015; Špiranec, 2016; Vičič, 2011),

DBR of ESP coursebooks involves multiple iterations, since "design-based interventions are rarely if ever designed and implemented perfectly" (Anderson & Shattuck, 2012, p. 17), so there is always space for improvement in the design and subsequent evaluation of an ESP coursebook.

An iterative and longitudinal character of DBR is closely related to the dynamic and interactive environment in which ESP teaching takes place: (1) different groups of students participate in evaluating the quality of the pilot and following versions of an ESP coursebook; (2) carrier content in some disciplines (e.g., information technology, medicine) is constantly evolving. Even though Bocanegra-Vale (2010), Stoller & Robinson (2014), and Barnard & Zemach (2014) outline the importance of the iterative development of an ESP coursebook, their studies miss the most distinctive feature of DBR, which is its theoretical yield – i.e., the production of ESP coursebook-design principles that can help ESP practitioners address problems related to their own ESP coursebooks' design.

3.3. Two-fold yield of ESP coursebook design-based research

The two-fold yield of DBR – namely intervention (an ESP coursebook) and advanced knowledge or theories that emerge from research – is one of its basic characteristics. It is important to realize that DBR involves systematic educational design processes, but not all systematic design processes can be called DBR. With its aim to validate and/or develop theories, DBR of ESP coursebooks differs from the developmental processes that focus solely on designing ESP coursebooks or learning materials through iterative testing and prototyping cycles, as Bakker and Van Eerde (2013, p. 3) observe: "in most other interventionist research approaches design and testing are cleanly separated".

According to Reeves (2006, p. 58), three key features of DBR are:
- addressing complex problems in real contexts in collaboration with practitioners;
- integrating known and hypothetical design principles with technological advances to render plausible solutions to these complex problems;
- conducting rigorous and reflective inquiry to test and refine innovative learning environments as well as to define new design principles.

ESP teachers in their dual role of researchers and practitioners are encouraged to integrate current and hypothetical design principles of ESP learning materials during the development of their own materials, evaluate their quality through several iterative cycles in collaboration with col-

leagues, students, and other stakeholders, and finally, validate and produce their own design principles that can be generalized to other design processes in different contexts of ESP teaching and learning.

3.4. Outline of an ESP coursebook design-based research project

Due to its naturalistic, collaborative, cyclical, iterative, and theory-driven character, DBR enables the gradual development and evaluation of an ESP coursebook. Moreover, its two-fold yield contributes not only to the design of the coursebook but also to the production of design principles leading to the development of ESP coursebook design theories. Unfortunately, despite an increasing need to design made-to-measure ESP coursebooks, the implementation of systematic DBR of ESP coursebooks is still missing. A research review (Ellederova, 2017) has revealed that only two studies focused on DBR of language for specific purposes (LSP) learning materials:

- a study of the development of LSP learning materials for Spanish courses (Pardo-Ballester & Rodríguez, 2010) focused on reading skills, but did not address productive and receptive skills;
- a study of the design of an ESP course (Bergroth-Koskinen & Seppälä, 2012) analysed learning materials in the form of tasks and PowerPoint, but did not include the key characteristic of DBR – the production of design principles as a result of the research.

Since 2018, DBR of an ESP coursebook, *English for information technology* (Ellederová, 2020), has been carried at the Department of Foreign Languages of the Faculty of Electrical Engineering and Communication at Brno University of Technology in cooperation with the Institute for Research in School Education of the Faculty of Education at Masaryk University in Brno, in the Czech Republic. The main goal of this DBR is to systematically develop and evaluate the coursebook so that it would be the most appropriate teaching and learning tool for the target group of students, as well as to produce design principles leading to ESP coursebook theory development. So far, two kinds of data collection methods have been selected: (1) a questionnaire survey focusing on the evaluation of the coursebook by teachers and students and (2) pre-testing and post-testing students' knowledge and skills before and after using the coursebook. The evaluation criteria checklist was transformed into questionnaire items presenting the respondents with a five-level Likert scale (from strongly agree to strongly disagree). In addition, each item included an empty box where respondents entered their comments related to the coursebook's quality. Twenty-four criteria

were clustered into the following seven categories: (1) general aims of the coursebook, (2) clear arrangement, (3) adequacy, (4) learning guidance, (5) motivational characteristics, (6) language content, and (7) language skills.

The first research findings (see Ellederová, 2019a, 2019b) indicated the necessity of coursebook redesign so that it could meet the needs of the target group of students. Next, the results validated some of the above-mentioned SLA theories and ESP coursebook-design theories and enabled the formulation of the following preliminary design principles:

(1) individual listening, reading, and speaking skills should be integrated within one task, thus supporting the development of more than one skill;

(2) reading, listening, and speaking tasks should be designed so that, while doing them, students can use and gradually acquire vocabulary related to the particular topic;

(3) each unit in an ESP coursebook should be structured around the terminology definitions related to its topic;

(4) specialist terminology should be repeated frequently within a given unit it should reoccur in the following units;

(5) the tasks in an ESP coursebook should enable students to acquire linguistic means for expressing language functions within various roles and contexts in their field of study; and

(6) audio and visual materials related to students' specialized field of study should motivate students and promote speaking.

The results of the research provided the basis for the coursebook's redesign, after which its new version will be implemented and evaluated in the same way. Finally, after at least two iterations, the ESP coursebook-design principles and design theories will be published.

4. CONCLUSION

ESP coursebooks play an important role in ESP teaching and learning, and their design is therefore a necessary element in the field of ESP. This state-of-the-art article aimed to frame the concept of ESP coursebooks and formulate the basic principles of their design. Even though many SLA studies focus on insights and teaching strategies to facilitate and improve the efficiency of second language learning, most of them have not been applied to coursebook design. For this reason, the design of ESP coursebooks from the perspective of SLA theories was discussed here. Moreover, design-based research was recommended as a suitable approach to ESP coursebook design where SLA theories can be put into practice, validated, and further developed.

To sum up, the general principles for ESP coursebook design are the same as the principles for designing a coursebook intended for general English learning; however, ESP coursebooks place more emphasis on developing specific skills and learning strategies applied through skill-based and task-based activities based on students' expertise and professional experience. What distinguishes ESP coursebooks from general English coursebooks is that linguistic devices are introduced in connection with language functions and discourse analysis, since they are considered as a means to an end, and they enable the implementation of specific target communication activities. Linguistic competence in ESP coursebooks is understood as a tool through which it is possible to achieve communicative competence in the target situation. ESP coursebooks should support the acquisition of individual learning strategies and enable students to be more autonomous and use the acquired communicative competence in their field of study and future professional life. While grammatical accuracy plays a significant role in general English coursebooks, speaking tasks in ESP coursebooks should place greater emphasis on fluency than on accuracy in accordance with English as a lingua franca in communication where speakers do not orientate themselves to native-speaker norms but negotiate meaning during conversation by adapting their skills to those of their partner and to the purpose of communication.

With regard to SLA theories, ESP coursebooks should include a wide range of genres and styles (from popular scientific to scientific) of spoken and written texts relevant and meaningful to the student target group's specialized field of study. An important and frequently discussed aspect of ESP coursebooks is their authenticity, which cannot be achieved if students do not respond to the texts provided in the same way as native speakers in real contexts, nor if the authentic tasks are not in line with their field of study. Tasks in ESP coursebooks should stimulate students both affectively and cognitively (e.g., through topical and thought-provoking texts and visuals), accommodate their learning styles, and enable them to solve problems related to their future profession, ideally in cooperation with others. Further, texts and tasks should enable students to discover different language features, focus on functional aspects of grammar, and provide students with opportunities (e.g., through role-play, debates, and case studies) to use the target language in order to achieve their communicative purposes.

The model of ESP coursebook design described above might help teachers who design their own learning materials clarify the terms and concepts associated with this issue. At the same time, this study provides insights and

factors that should be considered during the process of ESP coursebook design and evaluation. Although the design of ESP coursebooks in the academic environment has slowly become commonplace, it is rare for teachers to verify the quality of the coursebooks they design through research, thus receiving feedback and suggestions for their revision and improvement. One of the effective research methods that enables authors of coursebooks and learning materials to immediately implement their research findings into practice is DBR, whose methodology has been outlined here. ESP teachers as DBR researchers have the role of interventionist-observers, as they draw upon existing and emerging models of ESP learning and teaching in order to test, document, and theorize about the way the students respond in learning environments. DBR also contributes to the strengthening of the position of students who become active actors in the decision-making and planning of the learning process during the research, which is in accordance with a learner-centred approach to ESP teaching and learning. Not only can DBR improve coursebook quality based on cooperation between teachers, students, and other stakeholders, but it can also validate and critically develop the dominant theories of ESP coursebook design and evaluation. The main challenge for ESP coursebook DBR is to find a way to balance the goal of innovation with the need for consequent efficiency.

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Dizajn udžbenika engleskoga jezika struke: pitanja koja treba razmotriti i istraživanje temeljeno na dizajnu kao učinkovito rješenje

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U ovome članku prikazan je konceptualni okvir za stvaranje udžbenika za engleski jezik struke koji može pomoći učiteljima engleskoga jezika struke budući da često moraju prilagoditi postojeći ili osmisliti vlastiti nastavni materijal. Unatoč velikom broju udžbenika za poučavanje engleskoga jezika struke za različite tečajeve i područja studija dostupnih na tržištu, još uvijek je rijetkost naći one koji udovoljavaju potrebama studenata i specifičnim zahtjevima određenoga predmeta. Svaka je situacija učenja jedinstvena i na nju utječu različiti čimbenici, uključujući ograničenja nastavnoga programa, dinamiku učionice, očekivanja i motivaciju učenika. S obzirom na to da sveobuhvatan koncept za dizajn udžbenika za engleski jezik struke još nije objavljen, svrha je ove studije raspravljati, analizirati i konsolidirati različite pristupe dizajniranju udžbenika, posebno s obzirom na teorije usvajanja stranih jezika. U studiji se također predlažu dizajnerska istraživanja kao odgovarajuću metodologiju za izradu udžbenika za nastavu engleskoga jezika struke. Dvostruki prihod od istraživanja dizajna dovodi do korisnoga i djelotvornoga proizvoda, u ovom slučaju udžbenika engleskoga jezika struke, i principa dizajna koji vode razvoju teorija dizajna udžbenika engleskoga jezika struke.

Ključne riječi: *autentičnost, aktivnosti utemeljene na vještinama, aktivnosti utemeljene na zadatcima, udžbenik engleskoga jezika struke, istraživanje temeljeno na dizajnu, sadržaj nositelja*