Developing English Language Skills for Professional Communication in Medicine

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Abstract: *The purpose of the present article is to present a model for a content-based textbook as a teaching resource in the subject of English for medical purposes. We aimed at enhancing the quality of specialised foreign language teaching offered at university level as well as optimising and streamlining the training process. Based on the communicative approach, a conceptual model of the course Professional Communication in English for the specialty of medicine is demonstrated with incorporated lexico-grammatical tasks to develop the four language skills of speaking, reading, listening, and writing at level B2 (CEFR). The authenticity and the relevance of the learning content is verified with the help of a pre-compiled corpus of professional texts and keyword list collections. Each textbook text is checked for the extent of compatibility of its lexical content to the corpus keyword list for the purposes of focused instruction in the EMP classroom.*

Keywords*: EMP, content-based instruction, authenticity, corpus tools in language pedagogy*

Introduction

The contemporary training in English for Medical Purposes (EMP) is learner-centered and focused on the development of language skills such as reading, speaking, writing, and listening in contexts, appropriate to this specific professional domain. The role of the authentic materials is crucial to the successful delivery of EMP instruction, the achievement of the learning objectives, and the acquisition of the specialized communicative competence by the learners (Basturkmen 9).

Hence, the main advantages of the content-based method of instruction (Brinton 6-8) are the choice of relevant authentic texts around which language instruction is centered, the development of all four communicative skills, and the students' involvement in the training process. The content-based approach to teaching EMP at university level offers a dynamic and meaningful environment with a focus on the typical linguistic structures to enhance students' motivation and active participation in the learning process (Song 428).

The present study aims to exemplify the achievement of functional communicative competence in English for Medical Purposes in tertiary education. The chosen method is content- and task-based language

instruction which is characterized by the use of specialized academic texts that represent the highest linguistic level as well as the formal, objective and impersonal nature of the scientific style. The text sort is an informational text intended for a specialized audience, i.e. one with in-depth training in the field (Dobreva, Savova 121-24). Scientific texts have a certain logical structure and organization and are distinguished by their unambiguity, clarity, transparency, and consistency of content. Another characteristic feature of the text sort is the use of specialized terminology, stylistically neutral vocabulary, and typical collocational patterns. The inter-sentence relations are explicit and there is a uniformity of the lexico-grammatical patterns. Such texts are also characterized by a high level of coherence and meaningfulness, including elements of non-linguistic nature such as diagrams, graphs, drawings, photographs, or images. The dominant language functions of scientific texts for medical purposes are explaining, describing, defining, counselling, reassuring, identifying (e.g. asking questions in history taking interviews), offering assistance, making predictions, empathizing, exemplifying, emphasizing, summarizing, paraphrasing, expressing opinions and attitudes.

By selecting the text sort for classroom instruction we aim at developing both the receptive and the productive skills of the learners, the acquisition of specialized vocabulary as well as the consolidation of their sociolinguistic competence. For example, in EMP the training in the communicative skills of speaking focuses on oral doctor-patient communication in the form of medical interviews, but also on the communication between health professionals, or presentations, tailored to a set of predefined topics and to the level of language proficiency of the students. Thus, the texts are in accordance with the formal register, but certain communicative situations may require the use of the less formal register (e.g. doctor-patient interactions).

In this paper we present a methodological model for the development of communicative competence skills of medical students, learning English for professional purposes through content-and task-based instruction. At MU-Varna, the specialized English language course aims at achieving a high level of communicative skills (B2-C1), preparing students for their professional and academic career as medical doctors. The specialized English module is taught during the 2nd academic year, with a total of 60 hours of instruction, based on the students' general English knowledge, achieved at the high school stage, which usually ranges between levels B1-B2 (CEFR). The variables measured at the end of the course of study include appropriate use of specialized vocabulary and collocations, lexico-grammatical structures, and adherence to the stylistic features of the text sort. The two-part

examination, performed at the end of the course, comprises of a written part with listening and reading comprehension tasks, vocabulary, and terminology tasks, as well as a short essay of the descriptive, analytical, or persuasive type as a final task. The duration of the exam is 90 minutes. The oral part of the exam is an academic presentation on a topic of special interest for each student (Doykova, Dobreva 169-75).

As stated in the syllabus, the course content covers topics and genres of professional interest and the linguistic tools to provide a professionally adequate response when contacting patients and medical staff. In our model, the selection of topics covers the review of systems and common conditions including musculoskeletal health, respiratory health, care for the cardiovascular, the immune, the endocrine, the urinary, the digestive, the nervous, and the reproductive systems.

The overall course aim is to maximize the learning results, to increase the learners' motivation and to achieve learner autonomy in language acquisition, for instance, when listening to short lectures and presentations in English on topics related to medicine; when reading authentic scientific texts (articles, reports), or professional documentation such as patient medical history or letters of referral. Thematic depth is not sought after but the ability to be linguistically adequate within its confines through practically oriented communicative tasks, discussions, and role-plays. In order to meet the educational objectives, authentic journal articles were selected and adapted from specialized sources – electronic or print media, open access journals or medical books – and compiled into an English for Medical Purposes corpus (EMPC).

Methodology

For our corpus compilation we collected texts from professional healthcare websites (listed as references in the textbook), authentic open access research articles from journals such as *The BMC Journal, The Lancet, Nature Medicine, Biomed Research International, The Journal of Emergency Medicine, Journal of Medical Case Reports, Journal of Neuroscience, Journal of Mind and Medical Sciences, Advances in Medical Sciences, Schwartz's Principles of Surgery, MSD Manuals, Archives of Medicne and Health Sciences,* and medical books in different clinical fields. The data is retrieved and analysed from untagged electronic texts. The monolingual corpus contains 476,582 running words in English, but is inconclusive and open to further additions (corpus size). Thus, the corpus is limited to one style (medicine), which is supposed to provide the most repetitive patterns in medical discourse.

The selected texts were analysed with WordSmith Tool (Scott) and its main functions – concordance, keywords, wordlists, patterns of lexical use, and clusters as highly frequent patterns. To these representative texts in the field of medical communication we added 142 topic-related glossaries, covering all fields of medicine (Friedbichler 625-93). A discipline-specific keyword list was obtained (verbs, nouns, and adjectives with a frequency above 10), containing 100,000 concepts, phraseological units, and collocations. The keyword list also incorporates 819 lemmas, established as a medical academic word list (Lei, Liu 42-53). Function words were eliminated leaving only content entries. The established word list functions as a reference corpus for the lexical content and the task types of the EMP course. A sample of the extracted collocations on the topics covered in the syllabus is presented in Fig. 1.

Chest pain, sore throat, inflammatory disease, medication history, family history, loss of appetite, abandonment of care, abdominal distention, vital capacity, informed concent, range of motion, artificial ventilation, fetal presentation, target cell, immune tolerance, renal insufficiency, withdrawal syndrome, sinus node, lymph node, smooth recovery, sliding flap, drug delivery, communicable/contagious disease, spinal cord, emotional neglect, parenteral nutrition, indwelling catheter, venous access, hearing loss, clotting factor, upper extremity, occult bloods test, feeding tube, fine motor skills, fluid depletion, growth deficiency, glandular fever, postural imbalance, body mass index, intra-abdominal hemorrhage, focal involvement, clinical judgement, surgical knot, transient ischaemic attack, coronary heart disease, atrial fibrillation, etc.

Fig. 1. List of noun-based medical collocations, EMPC

We collected technical vocabulary and the widely dispersed words in the field of medicine, as well as the discourse markers which refer to this professional domain (Nation 17-21).

The second step was to check the texts used for the lexico-grammatical tasks for key word density with a specially created extension that can highlight specific words in running text. For example, the highlighted words in the sample below (Fig. 2) are low frequency words in the new general service list (NGSL), but prevalent in our EMP corpus and account for 33% of the text below. Such subject-specific (technical or domain-specific) vocabulary is the focus of our EMP training with an emphasis on recurrent language use for effective instruction within the time-constraints of the course.

According to a 2009 paper in the Archives of Neurology, "The most common symptoms, present with 50% or more, included rash, fever, chills and/or rigors, adenopathy, headache, myalgia, sweats, and cough.... The rash was maculopapular and progressed with sequential stages of papules, vesicles, and pustules. It was predominantly centrifugal and involved arms and/or hands in more than 80%, legs and/or feet in 65%, and head and/or neck in 6%." (Total of 69 words, 21 specific words)

Source: https://journals.lww.com/neurotodayonline/

Fig. 2. Technical text, highlighted for content-specific words, EMPC highlighter.

The New Academic Word List (Coxhead 213-38), which is relevant for academic writing purposes and the academic wordlist highlighters and vocabulary profilers are useful tools that allow the instructors to modify and adapt the text when creating gapfill tasks (Fig. 3).

Smell accounts for 95% to 99% of chemosensation; while, taste accounts for the rest of chemosensation. Anosmia or the inability to perceive smell/odor can be temporary or permanent and acquired or congenital. Any mechanical blockage preventing odors from reaching the olfactory nerves can cause a loss of sense of smell. This blockage can be due to inflammatory processes like simple infections causing mucus plugs or nasal polyps. Neurological causes can include disturbances to the sensory nerves that make up the olfactory bulb or anywhere along the path in which the signal of smell is transferred to the brain. To better understand this process, it is helpful to understand how people can perceive smell.

Source: https://pubmed.ncbi.nlm.nih.gov/29489163/

Fig. 3. Technical text, processed with AWL highlighter for academic words[1]

Lexical entries from the fields of biology, chemistry and physics such as *blockage, brain, infections, mucus, nerves, preventing, process, processes, sensory* are marked in colour (Fig. 4), and yet the content words, relevant for medical specialists remain outside the scope of these tools (e.g. *acquired, anosmia, cause, causing, chemosensation, congenital, inability, include, inflammatory, nasal, neurological, odor, olfactory, polyps).* Thus, despite the availability of such tools for vocabulary acquisition, applicable for academic

[1] https://www.eapfoundation.com/vocab/academic/highlighter/

and subject-specific fields of study, there is still room for the EMP instructor who strives to focus on discipline-specific vocabulary.

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Fig. 4. Technical text, processed with a vocabulary profiler for technical words[1]

Typology of tasks

The English language instruction is aimed at achieving a level of foreign language competency that ensures the accumulation of a rich vocabulary and phraseology, ability to use correct grammatical structures, to analyse, summarise, and comment on thematically-related issues, while stimulating independent thinking, and the formation of pragmatic competence.

The task types vary according to the specific topics and the objectives of the activities related to them, as well as the global objectives set in the course curriculum. The most prevalent task types are: lexical tasks to determine the accuracy of statements related to a text (true/false statements); multiple choice; accurate use of terminology and phraseology, cloze test tasks, use of key words/collocations in context (e.g. filling in a text with missing information), linking synonyms or antonyms, labelling, vocabulary exercises (e.g. matching terms to definitions); listening comprehension tasks related to authentic audio-visual materials and answering open questions; speaking tasks involving discussion on the topic of the text and/or the lesson unit; self-study tasks involving project work (e.g. presentations); simulated work situations and role-plays. Lexico-grammar exercises, mainly related to the knowledge of grammar items with frequent use in medical texts (e.g. choosing the verb tense or voice, rearranging sentences, word formation, use of present or past participles) are also incorporated in the teaching materials.

Activities to improve listening comprehension skills

We have developed formative listening comprehension tasks to train and to assess student performance by standardized tests. Students may be required to identify facts, details, or information explicitly stated in the source text, decode meaning of concepts, listen for gist, for specific information, or for detail. Students also practice active listening in role plays (doctor-patient dialogues when trying to understand both the content and the feelings of the "patient," to summarize, to paraphrase and to provide an empathetic response. Sample tasks that are included in the newly designed course book *Professional communication in English: Medicine* (Doykova 6-202) are presented below:

Task 1. Listen to a mini-lecture on anosmia and complete the missing words:

associated	preventing	perceive	surface	mucosa
causing	facilitate	impairment	processed	disturbances
acquired	extend			

Smell accounts for 95% to 99% of chemosensation; while, taste accounts for the rest of chemosensation. Anosmia or the inability to perceive smell/odor can be temporary or permanent and 1. _____ or congenital. Any mechanical blockage 2. _____ odors from reaching the olfactory nerves can cause a loss of sense of smell. This blockage can be due to inflammatory processes like simple infections 3. _____ mucus plugs or nasal polyps. Neurological causes can include 4. _____ to the sensory nerves that make up the olfactory bulb or anywhere along the path in which the signal of smell is transferred to the brain.

To better understand this process, it is helpful to understand how people can 5. _____ smell. When a particle with odorant molecules in the air is present, it travels up through the nasal canals to the nasal cavity, where olfactory receptor neurons 6. _____ from the olfactory bulb that sits on the cribriform plate of the brain. Each nasal cavity contains about 5 million receptor cells or neurons. There are 500 to 1000 different odor-binding proteins on the 7. _____ of these olfactory receptor cells. Each olfactory receptor cell expresses only one type of binding protein….

Task 2. Listen to the text and label the parts of the body which comprise the immune system.

Task 3. Listen about how hormones function and mark the correct statements:

1. The main elements of the endocrine system are _____.

A. The glands, hormones, and cell receptors

B. The glands, nerves, and blood vessels
C. The blood, tissue, and brain
D. The hormones, blood, and brain
2. Diabetes is a disease triggered by hormone imbalance, occurring when _____.
A. Adrenaline levels are imbalanced
B. The liver secretes too much insulin
C. There is too much insulin in the blood
D. The pancreas secretes too little insulin

Task 4. Listen to the talk on urinary tract infections (UTIs) and answer the questions below:

1. What is a UTI? .....
2. What are the symptoms of a UTI? .....
3. Why are UTIs more common in women? .....
4. Which diagnostic evaluation method is used for UTIs?.....
5. How are UTIs treated? .....
6. What should a urologist do to treat recurrent UTIs?.....
7. How can UTIs be prevented?.....

Activities to improve reading comprehension skills

This complex skill consists of different types of reading activities depending on the aim, the way the reading proceeds, and the context. The main distinction in such activities from a methodological point of view is between detailed and selective reading. Detailed reading is most often used as a means of checking language proficiency, while selective reading develops the skill of detecting only those elements of information in the text that are important or necessary for the reader. In these two types of reading, students apply analytical and critical thinking skills, the ability to analyse the formal side of the text, the ability to process the subtext, to detect intertextual and contextual features, to synthesize information, to critically evaluate what is read (Stefanova 108-09).

Task 5. Read about the female reproductive system and give short explanations to the questions:

1. Describe the path of an egg from the ovary to the outside of the female body: …
2. What is the difference between a zygote and an embryo?
3. In what ways are the female and male reproductive systems similar?
4. Describe the stages an egg goes through from fertilization to the birth of a baby.

Task 6. Read the text about the musculoskeletal system and mark the statements as True or False:

1. Ligaments anchor one bone to another and add considerable strength to the joint capsule.
2. Tendon is dense, tough, inelastic, white, fibrous tissue, serving to connect muscles.
3. Cartilage is flexible connective tissue found in the immature skeleton on joint surfaces.
4. Joint (articulation) is the point of contact between elements of the skeleton without the parts that surround and support it.

Task 7. What is human body tissue? Read the definitions and fill in the terms:

1. ..... is found all throughout the body. It responds to stimulation and contracts to provide movement.
2. ..... covers and protects our bodies and the lining of some organs in the form of skin, line internal cavities, and form glands.
3. ..... binds the cells and organs of the body together and performs many functions, especially in the protection, support, and integration of the body.
4. ..... allows the body to receive signals and transmit information as electric impulses from one region of the body to another.

Activities to expand vocabulary

Further on, the communicative approach to specialized foreign language teaching requires a focus on the combinatory potential of the terms and the technical vocabulary in the medical field. Such task types present a coherent text in which individual words or phrases are omitted according to the instructor's objectives. Shorter versions of the sample tasks are presented for illustrative purposes.

Task 8. Use the suggested head words to fill in the text with appropriate forms:

Unlike blood testing, saliva analysis looks at the cellular level (the biologically active compounds) and therefore saliva is truly a **representative** of what is clinically relevant. Hormones are smaller molecules and can be tested in saliva and they are indicators of health and **diseased** status in humans. The same proteins present in	REPRESENT DISEASE

blood are also present in saliva from fluid **leakage** at the gum line. Several tests are in the pipeline for uses ranging from pregnancy testing to the **detection** of chemicals such as alcohol and other drugs. Just a few of the many health issues and diseases that can be diagnosed through saliva and helped, resolved, or prevented through **supplementation** include but not limited to the following: acne, cholesterol, male pattern baldness, cancer, stress, heart problems, heart palpitations, allergies, cold body temperature, sleep problems, **inability** to absorb calcium, and difficulties in conceiving. Salivary diagnostic tests could eliminate the need not only for a trained technician but also of the potential risk of **contracting** infectious disease for both a technician and the patient.	LEAK DETECT SUPPLEMENT ABLE CONTRACT

Task 9. Complete the sentences with words derived from the suggested ones on the left.

Pad	Cartilage provides _____ for the ends of bones within joints.
Model	Bones renew and remodel throughout a person's life in a process known as bone _____, which constantly removes old bone tissue and adds new bone tissue.
Change	Bone remodeling serves to re-shape bones to adjust to _____ mechanical needs and to repair everyday micro-damages as well as fractures following injuries.
Increase	The most common bone disease is osteoporosis, or porous bone, in which bones lose mass and weaken, _____ risks of fractures.
Contain	The bones of a synovial joint are separated by a cavity _____ synovial fluid, which serves as lubricant.
Cause	Rheumatoid arthritis is a result of joint inflammation, with immune cells and inflammatory chemicals _____ damage to the joint.

Task 10. Explain what whould you do in the following situations:
1. Pulmonary emergenies

Some of the signs that may indicate a person may not be getting enough oxygen are: tachypnoea, difficulty breathing, stridor, wheezing, inability to speak, agitation or lethargy, the chest appears to sink, sweating.

Explain the first steps the doctor should perform when a patient is in respiratory distress:
Vital signs: RR, HR, BP, BT; pulse oximetry (for hypoxia), cardiac monitor (differentiate cardiac from pulmonary cause of dyspnoea); color (cyanotic, pale); ECG; oxygen: if SpO2 < 92%?

Activities to improve speaking skills

The productive skill of speaking is developed through practising various communicative situations (communication with patients, relatives, or medical professionals); describing graphs, tables, and charts; formulating types of questions when taking a patient history; explaining diagnoses and investigations, expressing opinion, agreement, or disagreement; counselling patients, etc.

Task 11. Read the case study and construct the doctor-patient consultation following the suggested steps: (case study not included here)

Procedure:
1. Greet the patient by name, offer a seat;
2. Introduce yourself (name and role), discuss the purpose of the conversation.
3. Explain what will happen next and check whether the patient agrees
4. Use open questions and encourage the patient to share his/her complaints and concerns.
5. Summarize when the patient has told you and ask if it is accurate. 6. Explain what will happen next.

Task 12. Consult the table and compare communicable and non-communicable diseases. Comment on the ways to prevent such diseases:

Stages	Communicable	Non-communicable
Onset	sudden	gradual
Cause	single	multiple
Treatment	short	prolonged
Progress	spread from person to person, infectious	chronic, slow-progressing, non-infectious
Transmission	Cannot be inherited	hereditary

Task 13. Choose a medical procedure or a test and explain to a patient how to prepare for it by answering the following questions:

When is the test/procedure used?

Why do the test/procedure?
What are the risks?
How to prepare for the test/procedure?

Task 14. Role play: a patient came to you with flu recently and has now presented with acute shortness of breath. You diagnose iron and vitamin deficiency anaemia.

Follow the suggested steps to perform a medical consultation:

find out – explain – empathize – reassure – advise – encourage – persuade – reinforce

1. Find out what the patient knows about anaemia.
2. Explain the causes of anaemia.
3. Discuss the treatment (iron supplementation, folate and vitamin B-12).
4. Reassure the patient about the safety of medications
5. Deal with the patient's anxiety about the problem, emphasizing that it can be controlled and discuss the prognosis for anaemia patients.
6. How can you make the explanation patient-friendly?

Activities to master writing skills

By developing the productive skill of writing the students learn to paraphrase, summarize, or prepare short reviews by adhering fully to the features of the scientific register and style. The ability to write different types of texts when learning a foreign language is one of the biggest challenges for most students. This skill requires complex lexico-grammatical knowledge as well as the ability to organize ideas, achieve cohesion, clarity, and conciseness. The skill of writing well in sciences is achieved only with perseverance, motivation, and practice. Sample writing tasks are presented for reference:

Task 15. Listen to what happens in the lungs during an asthma attack and write a short summary.

Task 16. Read the case study and prepare the doctor's instructions.

Task 17. Write a dialogue for the following situation:

Mr H. has been diagnosed with asthma and prescribed an inhaler. He will return to the outpatient clinic next month for a review of the inhaler's

effectiveness. If the inhaler doesn't prove effective, then a different treatment will be considered.

Task 18. Write your answers to the medical dilemmas:
What would you do if your patient was terrified and refused to get injections?
Would you refuse to treat an obese patient if she or he didn't try to exercise and eat healthy food?

Activities to revise grammar
The overall communicative competence of the students depends on the design of the tasks in the EMP coursebook that underpin specific skills. At this advanced level (B2), the predominant approach to grammar is the inductive one, with no explicit grammar instruction but subordination of the grammar item to the specific communicative needs of a given situationfor the construction of a comprehensive communicative competence. Therefore, the tasks for grammar retention can take many forms. A short review is presented below (sample tasks 9, 10).

Task 19. Circle the correct words or phrases to complete the text.

Brief History of Vaccine Development

Human use of preparations 1. **to prevent / preventing** specific infections have been described since 1500 AD, beginning in China. In 1796 in the United Kingdom, Edward Jenner observed the immunity to smallpox of milkmaids 2. **have / having** previously had natural infection with cowpox. He determined that 3. **inoculating / inoculate** small amounts of pus from the lesions of cowpox, presumably 4. **contain / containing** a virus related to vaccinia, into susceptible hosts rendered them immune to smallpox. The vaccine against smallpox was developed in 1798. The next phase of scientific developments 5 **involve / involving** the manipulation of infectious agents to extract suitable vaccine antigens took almost a century of research.…

Task 20. Use the verbs in brackets in the correct grammatical form to complete the sentences:

1. Muscles ..... to move the bone attached at the joint. (contract)
2. Could you ..... over and then straighten up, please? (bend)
3. If one muscle ..... a limb during its contraction, the other will return the limb to its original position when ..... (flex, extend)
4. In ..... the chest muscles expand the rib cage and allow air to be sucked into the lungs. (breathe)

The sequence of activities during a regular EMP seminar is based on the didactic principles of build-up, systematicity, complexity and integration and is usually as follows: preliminary discussion on the topic to activate learners' background knowledge; reading comprehension of a specialized text introducing the topic; listening comprehension task to consoliate knowledge and practice pronunciation; vocabulary and grammar exercises related to the specific technical language content; speaking sections to extend the topic or simulation of work scenarios (e.g. role play, solving a case study); and writing tasks (e.g. completing documents, summary, short essay tasks as part of the students' portfolio).

The medical consultation is a specific scientific technique for gathering health information about the patient status in order to establish a diagnosis. It occupies a central place in the work of the medical practitioner and allows for the establishment of appropriate doctor-patient relationships. Therefore, the overall theme of how to properly interview patients is interwoven into every textbook topic starting from the distinctive structure of the medical consultation, introducing the types of questions, and the specific language strategies when communicating with patients. Performing the medical consultation requires various diagnostic and therapeutic techniques to be applied in practice. Among these techniques, of particular importance are the communication methods used to gather health-related information, to provide answers and to inform the patient about their condition. Thus, the specifics of the medical consultation which require explicit training and knowledge of the personal (assertiveness, empathy, compliance) and interpersonal skills that a medical practitioner must possess become the backbone of the EMP course. The goal of the communicative competence instruction is to present the broad spectrum of characteristics of the medical consultation to the students through sample interviews, video models and participation in role-plays with peer feedback.

Conclusion

Based on the study of current ESP trends, a new textbook for English for specific purposes has been designed and piloted with 2nd year medical students at MU-Varna, offering content- and task-based instruction with focus on subject-specific language for integrated learning. Following the course completion, a survey was conducted with the medical students, as well as with the instructors who delivered the course. The results of the survey confirmed the effectiveness of the proposed methodological model as it Id a whole range of language competences – grammatical, lexical, orthographic, functional, discursive, sociolinguistic, semantic, and pragmatic. Students'

positive attitudes towards the use of authentic specialized texts and tailor-made tasks in EMP teaching validate the importance of content-based instruction in language pedagogy.

The development of a coursebook that fits the needs of medical students involves careful consideration of the syllabus content, selection and adaptation of materials in line with the syllabus, choosing the methodology for teaching that content and finally the establishing effective assessment tools for measuring students' progress towards the desired outcome.

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