Development of an English for Medical Purposes Instructional Model Based on Dialogue and Semantic Mapping to Enhance English Critical Reading Abilities and Vocabulary Retention for Nursing Students in Western Bangkok

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Abstract

This research aimed to: 1) develop an English for Medical Purposes (EMP) instructional model based on dialogue and semantic mapping to enhance critical reading ability and vocabulary retention for nursing students in Western Bangkok; 2) examine the model's efficiency; and 3) assess student satisfaction. The sample comprised 100 nursing students from Bangkokthonburi University, selected using a simple random sampling technique, with the university serving as the sampling unit. The research instruments consisted of: 1) the instructional model evaluation form, 2) the English critical reading test, 3) the English medical terminology test, 4) the instructional packages including the teaching manual, lesson plans, post-assessments, exercises, and teaching materials, and 5) the semi-structured questionnaire on students' opinions towards the developed instructional mode. A mixed-methods approach was employed, and data were analysed using descriptive statistics, paired-sample t-tests, the E1/E2 efficiency formula, and content analysis.

The research findings revealed that: 1) the developed instructional model consisted of six steps and was rated by experts at the highest level of satisfaction (M = 4.56, SD = 0.53); 2) the instructional model met the E1/E2 criterion, surpassing the 80/80 benchmark in all three testing phases (81.11/85.55, 81.33/80.83, and 80.63/80.35), indicating high efficiency in its application. Moreover, students' post-instruction scores in critical English reading were significantly higher than their pre-instruction scores at the .05 level, demonstrating improved learning outcomes. Additionally, medical English vocabulary test scores taken 14 days after the instructional activities remained significantly higher than the immediate post-test scores, also at the .05 level, suggesting that the model effectively supported long-term retention; and 3) nursing students reported the highest level of satisfaction with the instructional model (M = 4.69, SD = 0.48) and expressed positive attitudes toward the learning experience.

Ethical approval for the study was granted by the BTU Human Research Ethics Committee (BTUIRB No. 2568/81(5)).

Keywords: English for Medical; Instructional Model; Nursing Students

Introduction

According to the International Labour Organization (ILO, 2024), approximately 48% of Thailand's labour force comprises non-Thai ASEAN citizens, many of whom are employed in industry and agriculture. As Thailand continues to position itself as a regional healthcare hub, there is an increasing demand for effective healthcare services for migrant workers and international visitors. However, a persistent shortage of English-proficient healthcare professionals remains a significant challenge (Artsanthia & Chaleoykitti, 2016). While some hospitals employ interpreters, it is essential that medical staff possess sufficient English communication skills to ensure efficient and high-quality care. This need is consistent with national priorities outlined in Thailand's 13th National Economic and Social Development Plan (2023–2027), which emphasises human capital development and 21st-century competencies, including adaptability, critical thinking, and lifelong learning. Students are expected to operate effectively in multicultural settings and apply higher-order thinking skills, particularly in reading, listening, and evaluating information.

English proficiency especially in reading is a national concern. The Office of the National Economic and Social Development Council (2023) reports that 59.5% of Thai students fall below international standards in reading proficiency. This finding aligns with the United Nations (2024) report, which reinforces the concern that limited reading skills hinder access to skilled employment, thereby underscoring the urgent need for sustainable educational reform. Within this context, English for Specific Purposes (ESP) plays a vital role in addressing learners' academic and professional language needs. Thai universities have increasingly adopted ESP programmes that focus on discipline-specific vocabulary, critical reading, and oral communication. Scholars such as Dudley-Evans and St. John (1998) argue that ESP is more effective than general English instruction due to its targeted and purposeful content.

Effective ESP instruction must also account for the diversity of learners and the complexity of academic disciplines. UNESCO (2012) advocates for pedagogical approaches that foster intercultural competence, empathy, and global citizenship. The Dialogue approach (Phunphatracheewin, 2020) which promotes both general and advanced communication skills through the practice of deep listening, suspended judgment, mutual respect, and authentic self-expression thereby supporting these goals by fostering reflection, collaboration, and open-mindedness across cultural and academic contexts.

Neuroscientific research further supports this pedagogical direction. Studies by Jensen and McConchie (2020) and Siriwat (2016) demonstrate that calm, interactive learning

environments enhance memory and cognitive processing. Similarly, Po Ngern (2013) found that dialogue-based instruction significantly improves students' critical thinking and inquiry skills. However, these higher-order competencies depend on a solid foundation of vocabulary knowledge, particularly in ESP contexts.

Semantic mapping a visual strategy for organising related vocabulary complements cognitive learning processes and has been shown to improve comprehension and long-term retention (Tiansoodeenon et al., 2023; Al-Khasawneh & AlHawamdeh, 2023). Unlike rote memorisation, semantic mapping enables learners to contextualise and apply specialised terminology effectively.

Drawing on ESP theory, the dialogue approach, and semantic mapping, the researcher an experienced English educator developed an instructional model for nursing students. This model enhances critical reading and vocabulary retention through interactive dialogue and structured mapping activities, while also fostering personal development through respectful communication and reflective listening. The proposed English for Medical Purposes (EMP) model aims to equip nursing students in Western Bangkok with the language skills essential for professional practice in multicultural healthcare environments.

Research Objectives

1. To develop an English for Medical Purposes Instructional Model Based on Dialogue and Semantic Mapping to Enhance English Critical Reading Abilities and Vocabulary Retention for Nursing Students in Western Bangkok.

2. To examine the efficiency of the developed instructional model.

3. To assess the satisfaction of students towards the utilization of the developed instructional model.

Conceptual Framework

The research methodology of this study used a Research and Development (R&D) approach and employed a mixed methods research design, combining both quantitative and qualitative data collection.

Figure 1: Conceptual Framework

Research Methodology

The research methodology of this study used a Research and Development (R&D) approach and employed a mixed methods research design, combining both quantitative and qualitative data collection.
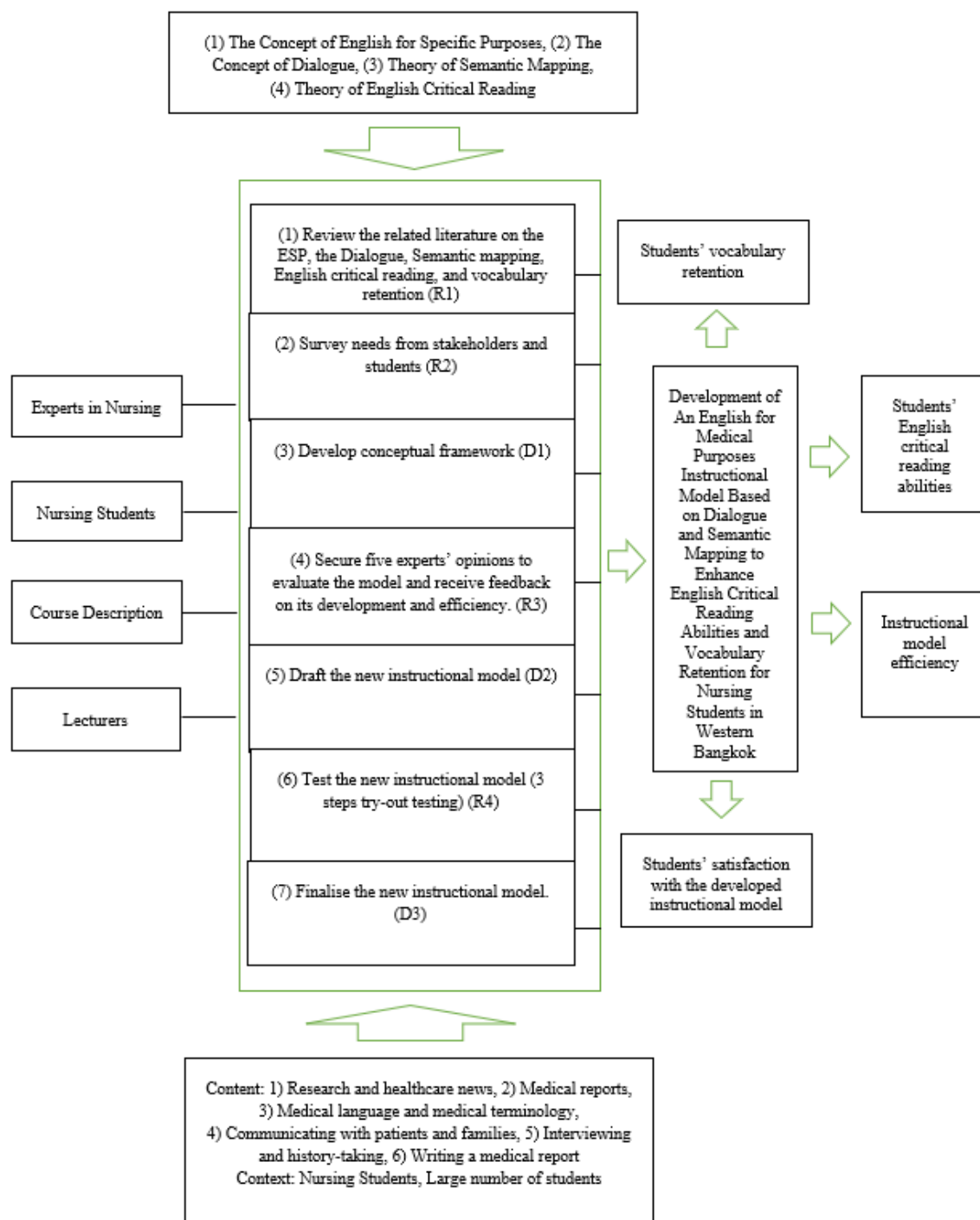
The population in this research was 700 bachelor degree students studying in the fields of health sciences at a total of 7 universities in western Bangkok, Thailand.

The sample group in this research was 100 bachelor degree students studying in the Nursing Programme at Bangkokthonburi University, which was obtained by a simple random sampling technique by using the university and faculty as a random unit.

The research instruments used in this study were: 1) the instructional model evaluation form, 2) the English critical reading test, 3) the English medical terminology test, 4) the instructional packages including the teaching manual, lesson plans, post-assessments, exercises, and teaching materials, and 5) the semi-structured questionnaire was interpreted using a mixed-methods approach. Quantitative items were analyzed using descriptive statistics, while qualitative responses were interpreted through content analysis to identify patterns, themes, and insights relevant to the instructional model's effectiveness.

The development and quality validation of the research instruments

1) Relevant literature and prior studies on instrument development were reviewed. 2) Research instruments were then designed in alignment with the study objectives. 3) These instruments were submitted to the research advisor and co-advisors for review to ensure accuracy and relevance. 4) Subsequently, five experts evaluated the instruments using the Item-Objective Congruence (IOC) method, with items scoring above 0.5 retained and others revised accordingly. 5) Based on the validation results, necessary modifications were made before finalising and printing the instruments for data collection. The evaluation form demonstrated strong psychometric properties, with a reliability coefficient (Cronbach's Alpha) of 0.92 and a content validity index (CVI) of 0.95, suggesting high internal consistency and expert consensus on content relevance. Both the English critical reading test ($p = 0.48$, $r = 0.34$, KR-20 = 0.96) and the medical terminology vocabulary test ($p = 0.49$, $r = 0.61$, KR-20 = 0.95) were structured as four-option multiple-choice formats, with each item having one correct answer. Scoring was dichotomous (1 = correct, 0 = incorrect).

Research Collection

The research collection was divided into two phrases;

During the preparation phase, 1) the researcher conducted an in-depth review of relevant literature to inform the development of the instructional model and its materials. 2) The model was developed by synthesizing the principles of semantic mapping and dialogue-based learning, resulting in the design of teaching steps and materials, including the English critical reading test, the English medical terminology test, a teaching manual, lesson plans, and a semi-structured student opinion questionnaire, based on the 7-step R4D3 model (Brahmawong, C., 2023). 3) A comprehensive research implementation plan was then designed. 4) The research instruments were validated through expert reviews. 5) A pilot study was conducted with a non-sample group to assess the feasibility and reliability

of the instructional model and its instruments. 6) Based on expert feedback and pilot study results, the model and instruments were revised and finalised.

During the implementation phase, 1) in the first week, the researcher conducted an orientation session for the sample group. 2) In the second week, the English critical reading pretest was administered, and instructional activities were implemented step by step over six weeks according to the planned schedule. 3) After the instructional period, the posttests including the English critical reading test, the English medical terminology test, and the semi-structured opinion questionnaire were administered. 4) Two weeks later, the English medical terminology test was conducted again to assess students' retention. 5) The researcher analyzed the data by comparing the pretest and posttest scores of the English critical reading test, evaluating retention through the delayed posttest, assessing student satisfaction, and coding students' comments for qualitative analysis.

Research Results

According to the research objective 1, In order to develop the instructional model was reviewed and validated by a panel of five experts. Results of the evaluation were summarised into two parts.

First, a set of teaching topics comprising 19 lessons was analyzed. These lessons were ranked in descending order based on their average scores, from the highest to the lowest, as follows: 1) Research and healthcare news (M = 4.60, SD = 0.75), 2) Medical reports (M = 4.50, SD = 0.61), 3) Medical language and medical terminology (M = 4.45, SD = 0.60), 4) Communicating with patients and families (M = 4.40, SD = 0.68), 5) Interviewing and history-taking (M = 4.30, SD = 0.86), 6) Writing a medical report (M = 4.15, SD = 0.81), 7) Writing meeting minutes (M = 4.00, SD = 1.03), 8) Maternity care (M = 3.95, SD = 1.00), 9) Heart disease (M = 3.85, SD = 0.81), 10) Writing a memorandum (M = 3.80, SD = 1.20), 11) Surgical care (M = 3.75, SD = 1.07), 12) CV writing and interviewing (M = 3.60, SD = 0.68), 13) The circulatory system (M = 3.50, SD = 1.15) and the digestive system (M = 3.50, SD = 0.89), 14) Preventing infection (M = 3.45, SD = 1.10), 15) Declaration of patient rights in Thailand (M = 3.40, SD = 1.05), 16) Pain (M = 3.20, SD = 1.15), 17) The respiratory system (M = 3.10, SD = 1.12), 18) Physical examination, medical specimens, and testing (M = 3.05, SD = 0.76), and 19) Cancer (M = 2.45, SD = 1.36).

Second, the experts expressed satisfaction with the developed instructional model, as presented in the table below.

Table 1 Results of the evaluation of the instructional model

Evaluation list	(M)	(SD)	Interpretation
1. Components are logically connected	4.80	0.45	Very Satisfied

Evaluation list	(M)	(SD)	Interpretation
2. Steps are clear and easy to follow	4.60	0.55	Very Satisfied
3. Steps are practical to implement	4.40	0.55	Satisfied
4. Suitable for teaching critical reading and vocabulary via semantic mapping and dialogue	4.40	0.55	Satisfied
5. Overall, the model is satisfactory	4.60	0.55	Very Satisfied
Total	4.56	0.53	Very Satisfied

The overall score across the five evaluation items was indicating a "very satisfied" level (*M* = 4.56, *SD* = 0.530) of agreement from the five experts. For individual components, the highest-rated item was the logical connection of each part of the model, with *M* = 4.80, *SD* = 0.45, reflecting strong consensus regarding the model's coherence and structure. This was followed by the clarity and comprehensibility of the model steps (*M* = 4.60, *SD* = 0.55) and the level of satisfaction with the model (*M* = 4.60, *SD* = 0.55), both of which also fall within the "very satisfied" range. The criteria concerning the ease of implementation and the appropriateness of the model for enhancing critical reading and vocabulary through semantic mapping and dialogue each received *M* = 4.40, *SD* = 0.55, corresponding to a "satisfied" level. In conclusion, the instructional model was positively evaluated across all dimensions, with particularly strong support for its logical structure, clarity, and overall design. The overall result confirms that the model is both appropriate and feasible for application in English for Medical Purposes instruction, especially for improving learners' critical reading skills and vocabulary retention.

According to the research objective 2, the researcher examined the model's efficiency using the E1/E2 formula, as proposed by Chaiyong Brahmawong (2013), with the efficiency criterion set at 80/80 through a Three-Step Tryout process, which consisted of: 1) Individual Testing, 2) Small-Group Testing, and 3) Field-Study Testing. The E1 value represented the total scores obtained from the assessments conducted during Lessons 1 to 3, with each lesson carrying a maximum score of 10 points, resulting in a total possible score of 30 points. The E2 value referred to the score from the post-test, which consisted of 60 questions, with a maximum possible score of 60 points.

Table 2 Results of Small-Group Testing on the Efficiency of a Medical English Instructional
Model Based on Dialogue and Semantic Mapping.

Small-Group Testing	(n)	Full Score	Total	(M)	Percentage
Implementation (E1)	1:3	30	73	24.33	81.11
Post-test (E2)		60	154	51.33	85.55

Table 3 Results of the Field-Study Testing Step on the Efficiency of a Medical English Instructional
Model Based on Dialogue and Semantic Mapping.

Field-Study Testing	(n)	Full Score	Total	(M)	Percentage
Implementation (E1)	1:10	30	244	24.4	81.33
Post-test (E2)		60	485	48.5	80.83

Table 4 Results of the Experimental Testing Step on the Efficiency of a Medical English
Instructional Model Based on Dialogue and Semantic Mapping.

Experiment (Trial Run)	(n)	Full Score	Total	(M)	Percentage
Implementation (E1)	1:100	30	2419	24.19	80.63
Post-test (E2)		60	4821	48.21	80.35

The model underwent a Three-Step Tryout: Individual, Small-Group, and Field-Study Testing. Results from the Small-Group Testing showed an E1 score of 81.11% and an E2 score of 85.55%, while the Field-Study Testing yielded an E1 of 81.33% and an E2 of 80.83%. In the final Experimental Testing, E1 reached 80.63% and E2 reached 80.35%. All outcomes exceeded the set criteria, indicating the model's instructional efficiency and effectiveness in enhancing English critical reading abilities and vocabulary retention.

Table 5 Comparison of English Critical Reading Ability Scores Before and After Learning Through
a Medical English Instructional Model Based on Dialogue and Semantic Mapping.

Paired	(n)	Scores	(M)	(SD)	t-test	Sig.
Pretest	100	60	35.26	5.930	-36.231	.000
Posttest	100	60	48.21	5.688		

p < .05

The comparison of English critical reading ability scores before and after instruction using the Medical English Instructional Model based on Dialogue and Semantic Mapping showed a significant improvement. The post-test scores (*M* = 48.21, *SD* = 5.688) were notably higher than the pre-test scores (*M* = 35.26, *SD* = 5.930), demonstrating a statistically significant difference at the .05 level. The paired samples t-test result (t = -36.231, p < .000) confirms

that the instructional model effectively enhanced the English critical reading abilities of the nursing students. These findings also provide strong support for the overall efficiency and effectiveness of the developed model.

Table 6 Comparison of English Vocabulary Post-Test and 14-Day Delayed Post-Test Scores after Using a Medical English Instructional Model Based on Dialogue and Semantic Mapping

Paired	(n)	Scores	(M)	(SD)	t-test	Sig.
Posttest	100	30	24.75	4.106	-6.995	.000
The 14-day delayed	100	30	26.01	3.497		

p < .05

The comparison of English vocabulary scores between the immediate post-test and the 14-day delayed post-test after instruction using the Medical English Instructional Model based on Dialogue and Semantic Mapping revealed a statistically significant improvement. The delayed post-test scores (*M* = 26.01, *SD* = 3.497) were higher than the immediate post-test scores (*M* = 24.75, *SD* = 4.106), with a paired samples t-test result of (t = -6.995, p < .000), indicating a statistically significant difference at the .05 level. This suggests that the instructional model not only supported immediate vocabulary acquisition but also contributed to the retention of vocabulary knowledge over time. These findings further confirm the model's effectiveness in enhancing and sustaining learners' vocabulary development in a medical English context.

According to research objective 3, to assess the satisfaction of students towards the utilisation of an English for Medical Purposes Instructional Model Based on Dialogue and Semantic Mapping to Enhance English Critical Reading Abilities and Vocabulary Retention. The semi-structured questionnaire was used to interpret the data using a mixed-methods approach. Quantitative items were analyzed using descriptive statistics, while qualitative responses were interpreted through content analysis to identify patterns, themes, and insights relevant to the instructional model's effectiveness. In Quantitative, there were focused on four main areas: 1) content, 2) instructional procedures, 3) assessment and evaluation of learning outcomes, and 4) the perceived benefits of engaging with the model. In the Qualitative the data were used as triangulation to check the quantitative data and overall.

Table 7 Student's satisfaction on an English for Medical Purposes Instructional Model Based on Dialogue and Semantic Mapping to Enhance English Critical Reading Abilities and Vocabulary Retention.

Statement	(M)	(SD)	Interpretation
1. Content	4.63	0.53	Very Satisfied
1.1. Suitable for undergraduate level	4.61	0.60	Very Satisfied
1.2. Content and time allocation are appropriate	4.51	0.54	Very Satisfied
1.3. Content is up-to-date and relevant to the field	4.77	0.47	Very Satisfied
2. Learning activity	4.54	0.56	Very Satisfied
2.1. Clear instructions improve student participation	4.88	0.38	Very Satisfied
2.2. Thought-provoking questions and semantic mapping support group work	4.82	0.44	Very Satisfied
2.3. Expressing opinions from readings enhances critical thinking	4.39	0.71	Satisfied
2.4. Deep listening builds understanding and new knowledge	4.21	0.70	Satisfied
2.5. Joint lesson summaries using semantic mapping clarify key points	4.44	0.61	Satisfied
3. Measurement and evaluation	4.72	0.49	Very Satisfied
3.1 Are you satisfied with evaluating your own learning?	4.60	0.55	Very Satisfied
3.2 Assessment methods align with content and activities	4.84	0.44	Very Satisfied
4. Benefits	4.90	0.35	Very Satisfied
4.1 Activities support vocabulary recall in medical contexts	4.90	0.36	Very Satisfied
4.2 Activities enhance reading, analytical, and critical thinking skills	4.91	0.35	Very Satisfied

According to Table 7, the study found that students' overall satisfaction with the English for Medical Purposes instructional model was at a "Very Satisfied" level (M = 4.69, SD = 0.48), based on the five-point Likert scale. The highest-rated component (very satisfied) was Benefits (M = 4.90, SD = 0.35), followed by Measurement and Evaluation (M = 4.72, SD = 0.49), Content (M = 4.63, SD = 0.53), and Learning Activities (M = 4.54, SD = 0.56). Students especially appreciated activities that enhanced reading, analytical, and critical thinking (M = 4.91, SD = 0.35), supported vocabulary recall (M = 4.90, SD = 0.36), and provided clear instructions and procedures (M = 4.88, SD = 0.38). They also rated the alignment of assessment with content highly (M = 4.84, SD = 0.44), along with the use of semantic mapping and teacher questioning for group work (M = 4.82, SD = 0.44). Content was seen as current (M = 4.77, SD = 0.47), level-appropriate (M = 4.61, SD = 0.60), and well-matched with time allocation (M = 4.51, SD = 0.54). Self-evaluation was also appreciated (M = 4.60, SD = 0.55). Three items were rated at the "Satisfied" level: collaborative semantic mapping

(*M* = 4.44, *SD* = 0.61), opinion sharing for critical thinking (*M* = 4.39, *SD* = 0.71), and deep listening for perspective-taking (*M* = 4.21, *SD* = 0.70). Overall, students expressed high satisfaction (very satisfied), particularly in vocabulary retention, critical thinking, content relevance, and active learning, affirming the model's effectiveness for medical English instruction.

Research Discussion

According to research objective 1, to develop the English for Medical Purposes (EMP) Instructional Model Based on Dialogue and Semantic Mapping for Nursing Students in Western Bangkok. The model's foundation was not built arbitrarily it was methodically structured following Brahmawong's (2013) Seven-Step R&D framework, ensuring that the process moved from contextual and needs analysis through to implementation and evaluation in a systematic and pedagogically sound manner. Such an approach guaranteed internal coherence, instructional relevance, and a clear focus on learner engagement and outcomes.

Although the model was operationalised in six steps for practical implementation, its flexible structure resonates with recent perspectives, such as Lee and Hannafin (2021), who argue that instructional models should serve as adaptive frameworks responsive to specific learner characteristics and contexts. Among the assessed components, the logical flow of content received the highest rating (M = 4.80, SD = 0.45), followed by the clarity of instructional procedures (M = 4.60, SD = 0.55) and satisfaction with the overall design (M = 4.60, SD = 0.52). Slightly lower but still strong scores were recorded for implementation feasibility (M = 4.40, SD = 0.63) and the model's suitability for enhancing critical reading and vocabulary retention (M = 4.40, SD = 0.60). These results suggested refinement opportunities rather than structural flaws.

Expert evaluations were supported by student qualitative feedback, which offered deeper insights into the model's effectiveness. A recurring theme was the value of logically sequenced, structured tasks, which aligns with current research emphasising the importance of task scaffolding and sequencing in health-related English instruction (Rugyatisakul, Ampunsirirat and Chidnayee, 2025) Students also appreciated alternating between individual and group work, a feature that supports differentiated instruction and learner autonomy. For example, Student 62 remarked, "Reading individually helped me understand unfamiliar terminology before discussing it with others," aligning with Kormos and Csizér's (2014) findings on learner autonomy in EFL medical contexts.

Semantic mapping stood out as one of the most effective strategies. Students reported its utility in summarising, storing, and retrieving complex information, especially domain-specific terminology. Student 100 said, "Making my own mind maps helped me remember the lessons better," and Student 11 added, "I used semantic mapping in

biochemistry it helped me summarise and remember chemical names and terms." These observations align with recent studies like Ying Nie (2020), who found that visual-based mapping techniques significantly enhance vocabulary acquisition and conceptual retention in medical English.

Students also praised the model's transparent and fair assessment methods. Student 61 noted, "The scores were clear and fair, so we knew what was expected," and Student 78 shared, "Everyone worked harder because the grading felt justified." This feedback supports recent work by DePascale and Brookhart (2023), which emphasises the role of transparent formative assessment in boosting learner motivation, clarity, and performance in ESP environments.

Additionally, students valued the socio-emotional aspects of dialogue-based learning. Student 3 said, "Using polite language made conversations smoother and helped our group work better," while Student 42 remarked, "It helped build friendships and cooperation." Student 75 added, "I felt like my classmates actually listened to me it made me feel confident." These insights reflect the principles of socially constructed learning and communicative competence emphasised by Jongjorhor and Sittiwong. (2014), who found that dialogue-driven instruction enhances both language skills and peer collaboration in specialised field such as healthcare English settings.

In summary, the EMP model effectively integrated recent theoretical insights, expert validation, and student perspectives. It fostered language development, critical thinking, and interpersonal competence, making it highly applicable in ESP instruction, particularly in healthcare contexts where such competencies are essential.

According to research objective 2, the researcher examined the model's efficiency. The model demonstrates clear effectiveness in improving nursing students' English critical reading and vocabulary retention in Western Bangkok.

The model's success across individual, group, and field-study testing confirms its alignment with recent perspectives in English for Specific Purposes (ESP), which emphasise learner-centred pedagogy, contextualised materials, and task-based interaction (Hyland, 2016; Basturkmen, 2019). Student feedback supports this dimension. Student 17 reflected, "I enjoy switching between individual and group work. I can choose interesting points to present and feel free to express my opinions." Similarly, Student 39 shared, "My group was very excited to present our work in class. We discussed the topic and agreed on the content together." These responses align with contemporary ESP approaches that promote multimodal, collaborative, and autonomous learning environments, supporting both relevance and learner motivation.

The use of formative assessment and self-reflection further strengthened learner autonomy and engagement. Student 5 shared, "Being able to evaluate myself made me feel proud," while Student 14 noted, "I could clearly see how many points my work would

receive, which made me accept the quality standards more willingly." These insights support the educational principles discussed in Wiliam (2018) and Clarke (2021), which stress the formative process as key to motivation and metacognitive awareness.

Statistical data confirmed the model's effectiveness: post-test scores in English critical reading (M = 48.21, SD = 5.688) were significantly higher than pre-test scores (M = 35.26, SD = 5.930), t(99) = -36.231, p < .001. This aligns with sociocultural approaches to second language education that highlight the role of collaborative learning, peer interaction, and scaffolded dialogue in skill development (Walqui & van Lier, 2015). Student 3 reflected, "Practicing speaking more slowly, thinking before speaking, and using polite language made conversations with friends more engaging. As the group leader, it also made my work easier," showing increased awareness of pragmatic use and social appropriateness.

Similarly, vocabulary retention improved over time, with 14-day delayed post-test scores (M = 26.01, SD = 3.497) exceeding immediate post-test scores (M = 24.75, SD = 4.106), t(99) = -6.995, p < .001. This supports evidence from Webb and Nation (2017), who argue that vocabulary acquisition is more effective when learners engage in structured, meaningful, and repeated exposure, such as through semantic mapping. Student 11 noted, "I tried applying semantic mapping in my biochemistry class. It helped summarise the lessons and made it easier to remember the names of chemicals and elements," indicating knowledge transfer across disciplines.

In summary, the Medical English Instructional Model significantly enhanced English critical reading and vocabulary retention, demonstrating measurable effectiveness and theoretical consistency. The integration of dialogue, semantic mapping, and formative evaluation represents a replicable framework for English for Medical Purposes instruction, aligned with current educational and linguistic research.

According to research objective 3, the satisfaction findings for the English for Medical Purposes (EMP) instructional model show high approval from nursing students across four areas: Benefits, Measurement and Evaluation, Content, and Learning Activities. These ratings are supported by student feedback and current educational theories.

Benefits (M = 4.90, SD = 0.35) Students highly valued vocabulary retention, critical reading, and interpersonal growth. Student 11 said, "I tried applying semantic mapping in my biochemistry class. It helped summarize the lessons and made it easier to remember the names of chemicals and elements." This supports Nation's (2020) vocabulary learning strategies, which highlight the importance of visual and semantic tools in long-term retention. Collaborative learning promoted respectful interactions: Student 3 noted, "Practicing speaking more slowly, thinking before speaking, and using polite language made conversations with friends more engaging," while Student 75 shared, "I felt that my peers actually listened to my opinions...that felt really good." These align with sociocultural perspectives in second

language learning that promote interpersonal growth through dialogue and peer interaction (Gibbons, 2022).

Measurement and Evaluation (M = 4.72, SD = 0.49) Students appreciated clear, fair assessments. Student 14 said, "I could clearly see how many points my work would receive, which made me accept the quality standards more willingly," and Student 5 added, "Being able to evaluate myself made me feel proud." These reflections align with Wiliam's (2018) principles of formative assessment and Clarke's (2021) emphasis on feedback for learner development. Peer motivation was also noted, as Student 78 said, "My classmates were more enthusiastic than in regular classes… we had to do quality work to receive good scores," consistent with research highlighting the motivational effects of peer-supported learning environments (Carless & Boud, 2020).

Content (M = 4.63, SD = 0.53) Students requested a wider range of topics. Student 44 commented, "I would like to read articles on psychology, economics, or politics as well not just medical articles," while Student 84 added, "I would like to read about the historical background of various diseases." These comments support Coyle, Hood, and Marsh's (2021) content-based learning approach, which emphasises integrating varied disciplines for meaningful engagement. Student 35 suggested, "I would like the instructor to provide PowerPoint lesson files so I can review them in my free time," and Student 92 proposed compiling readings into an e-book. These suggestions reflect the principles of Universal Design for Learning (UDL), which promote accessibility and flexible resources (Meyer, Rose, & Gordon, 2021). Student 100 said, "Creating my own mind maps made the tasks more engaging and enjoyable," aligning with Novak and Cañas's (2020) view that learner-generated concept maps enhance deeper comprehension.

Learning Activities (M = 4.54, SD = 0.56) Students appreciated alternating group and individual work. Student 12 said, "I enjoy switching between working alone and in a group it keeps things from getting boring," while Student 45 added, "Sometimes I volunteer to work individually and ask my friends for minor assistance. This helps ensure continuity." These preferences reflect the value of differentiated instruction and flexible task structures in promoting learner autonomy and engagement, as supported by Tomlinson (2021) and Hattie & Clarke (2019), who advocate for varied and cooperative approaches in active learning environments.

Recommendations for Future Research

1. Learning activities should be conducted over an extended period of more than two hours to ensure continuity and comprehensive engagement. This allows sufficient time for essential steps such as group formation, information gathering, completing exercises, and progressing to concept mapping and knowledge presentation. A one-hour session may be insufficient for achieving meaningful learning through these critical stages.

2. Examine the Long-Term Impact of the EMP Model on Professional Communication Skills. Given the model's limited emphasis on speaking skills, future studies should investigate how it influences oral communication in clinical contexts over time. This could determine whether supplementary speaking-focused modules are necessary.

3. Test the Model Across Different Healthcare Disciplines and Regions. To assess the model's scalability, researchers should implement and evaluate the EMP instructional model with students from other medical fields (e.g., dentistry, public health) or in regions beyond Western Bangkok, comparing learning outcomes and contextual adaptability.

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