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Fostering Critical Reading and Research Skills in Medical Students through English for Careers Classes

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Abstract: *This article investigates the impact of integrating critical reading and research skills within English for Careers classes on the development of these competencies among second-year medical students. By examining various strategies and activities that can be implemented within these classes, the study aims to cultivate these competencies effectively. The theoretical background supporting this approach includes constructivist theory, experiential learning theory, and the Community of Inquiry framework.*

The research procedure involved second-year medical students from the Medical Faculty of a Medical University, with participants divided into a control group and an experimental group. A well-structured and tailored curriculum was designed to integrate critical reading and research skills within the English language learning context. Pre- and post-assessment instruments were developed to measure students' critical reading and research skills. The results showed a significant improvement in these skills among the students who participated in the English for Careers classes compared to the control group. The study demonstrated a statistically significant increase in the mean scores of the experimental group in various measures of critical reading and research skills, including reading comprehension, research article evaluations, and critical analysis.

The findings highlight the effectiveness of integrating critical reading and research skills within English for Careers classes in fostering the development of these competencies among medical students. By equipping students with these skills, they are better prepared to provide evidence-based patient care, contribute to medical knowledge, and stay updated with advancements in their field. The article emphasizes the importance of creating a supportive learning environment that promotes active engagement, critical thinking, and the acquisition of essential reading and research competencies.

Keywords: *critical reading, research skills, medical students, English for Careers classes, competencies, effectiveness, evidence-based patient care, medical knowledge, advancements, supportive learning environment, critical thinking.*

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Introduction

In medicine, critical reading and research skills are paramount for medical students as they navigate the ever-evolving landscape of healthcare. The ability to critically analyze and interpret scientific literature, coupled with research competence, equips medical students with the tools necessary to provide evidence-based patient care, contribute to medical knowledge, and stay abreast of emerging advancements in their field.

English for Careers classes present a unique opportunity to foster critical reading and research skills among medical students. By integrating language learning with the development of these essential competencies, students can enhance their ability to comprehend and evaluate medical literature, effectively communicate research findings, and engage in scholarly activities. This interdisciplinary approach not only bolsters students' language proficiency but also equips them with the necessary skills to navigate the scientific realm of medicine.

The issue of importance of development communication competence for physicians was studied by eminent educators: Means et al. (2009), Beliveau et al. (2014), Abu-Zaid and Alkattan (2013), Ali et al. (2017) and others, with the interest to their investigations determining the objective of our work.

This article aims to investigate the impact of integrating critical reading and research skills within English for Careers classes on the development of these competencies among second-year medical students. By examining various strategies and activities that can be implemented within these classes, we can better understand how to cultivate these competencies effectively. Through a comprehensive approach that includes introduction to medical literature, reading comprehension exercises, evaluation of research articles, research proposal development, journal club discussions, statistical understanding, literature reviews, research ethics discussions, and collaborative research projects, medical students can develop the necessary skills to excel as lifelong learners and contribute to the advancement of medical science.

By integrating critical reading and research skills into English for Careers classes, we can ensure that medical students not only possess a strong command of the English language but also possess the analytical prowess required to navigate and contribute to the complex world of medical research and evidence-based practice.

Enhancing critical reading and research abilities among foreign medical students within English for Careers classes provides strategies and

activities that foster the development of these skills. This includes introducing students to medical literature, engaging in reading comprehension exercises, evaluating research articles, conducting research proposal development, organizing journal club discussions, emphasizing statistical understanding, assigning literature reviews, facilitating research ethics discussions, and encouraging collaborative research projects. The goal is to create a supportive learning environment that promotes active engagement, critical thinking, and the acquisition of essential reading and research competencies.

Theoretical Background

Fostering critical reading and research skills in medical students through English for Careers classes is rooted in several educational theories and frameworks. These theories highlight the importance of integrating language learning with the development of critical thinking, research competence, and scholarly engagement. Here are some key theoretical perspectives that inform this topic:

Constructivist theory emphasizes the active construction of knowledge by learners through meaningful experiences. In the context of critical reading and research skills, students engage in the process of constructing knowledge by actively analyzing, evaluating, and synthesizing information from scientific literature. English for Careers classes can provide a supportive environment where students actively engage with medical texts and collaboratively construct meaning through discussions, activities, and reflections.

Experiential learning theory, popularized by Kolb (2015), posits that learning occurs through a cycle of concrete experiences, reflective observation, abstract conceptualization, and active experimentation. In the context of critical reading and research skills, students can engage in experiential learning by actively reading and analyzing medical literature, reflecting on their understanding, conceptualizing new ideas, and applying their knowledge in research activities or discussions within English for Careers classes. According to the article titled "Development of Communication Competence in Foreign Medical Students at English for Careers Classes", the various strategies and activities employed in these classes to promote communication skills, including role-plays, case studies, and interactive discussions (Dudina et al., 2022).

The Community of Inquiry framework, proposed by Garrison et al. (2010), highlights the importance of social presence, cognitive presence, and teaching presence in online learning environments. This framework is applied to English for Careers classes, emphasizing the collaborative nature

of critical reading and research. Through online discussions, collaborative projects, and peer feedback, students can engage in a community of inquiry to enhance their critical thinking and research skills.

In the article titled "Physician Competence: A Perspective from the Practicing Cardiologist" by Beliveau et al. (2014) provides a perspective on physician competence from the viewpoint of practicing cardiologists. The authors discuss the essential qualities and skills that contribute to physician competence, such as clinical knowledge, technical proficiency, communication abilities, professionalism, and lifelong learning. It emphasizes the importance of ongoing professional development and the need for physicians to stay up-to-date with advances in medical knowledge and technology. Also the article titled "The Role of Information Technology in the Training of Healthcare Professionals" explores the significance of information technology in the education and training of healthcare professionals (Dudina et al., 2022). The authors discuss the various ways in which technology can be integrated into healthcare education, including e-learning platforms, virtual simulations, electronic medical records, telemedicine, and mobile applications. They emphasize the importance of incorporating information technology in the curriculum to prepare healthcare professionals for the evolving healthcare landscape. Despite the article "The Value of Writing Skills as an Addition to the Medical School Curriculum" by Malik (2017) emphasizes the importance of incorporating writing skills in medical education. The article highlights the role of writing in medical practice, including writing patient reports, research papers, and grant proposals.

Academic literacy refers to the ability to read, comprehend, and critically evaluate scholarly texts within specific disciplines. Fostering critical reading and research skills in medical students aligns with the goal of developing academic literacy. English for Careers classes can provide instruction on discipline-specific vocabulary, comprehension strategies, and critical reading techniques to enhance students' ability to navigate and understand medical literature effectively.

Materials and Methods

Participants

The research involved the 2nd year students of Medical Faculty of Donetsk National Medical University with a control group of 10 students and an experimental group of 11 students. Their participation was voluntary and they were provided with all necessary information about the experiment procedures, purposes and outcomes.

Apparatus and Materials:

A well-structured and tailored curriculum specifically designed to integrate critical reading and research skills within the English language learning context. The curriculum included modules on medical literature comprehension, research methodology, critical appraisal, and effective scientific writing. A variety of course materials were prepared to support the development of critical reading and research skills. These materials included authentic medical texts, research articles, case studies, scientific journals, and academic writing samples. It was created the system of practical classes in English for Careers for fostering critical reading and research skills in medical students according to "Innovative curriculum for second-year Harvard-MIT medical students" by Ali et al. (2017) that presents a novel curriculum designed to enhance communication skills in second-year medical students.

Table 1. The system of the practical classes in English for careers to foster critical reading and research skills for the 2nd year medical students

Activities	**Goal settings**
Introduction to Critical Reading and Research Skills:	- Overview of the importance of critical reading and research skills in the medical field. - Introduction to evidence-based medicine and its relevance to clinical practice. - Discussion on the role of research in advancing medical knowledge and improving patient care.
Research Methodology:	- Introduction to research methodologies commonly used in medical research. - Explanation of study designs, including observational studies, clinical trials, and systematic reviews. - Exploration of research ethics, informed consent, and Institutional Review Board (IRB) processes. - Practical exercises on formulating research questions and designing a research study.
Literature Review and Comprehension:	- Techniques for conducting a comprehensive literature review. - Strategies for effectively searching and selecting relevant research articles. - Critical reading skills, including understanding research objectives, study populations, methods, and results. - Evaluation of the credibility and reliability of research sources.
Statistical Analysis and Interpretation:	- Introduction to basic statistical concepts and data analysis methods commonly used in medical research. - Hands-on exercises on interpreting research findings and understanding statistical significance.

	- Application of statistical software for data analysis and interpretation.
Critical Appraisal of Research Articles	- Systematic approach to critically appraising research articles. - Identification of potential biases, limitations, and confounding factors in study design and analysis. - Evaluation of the relevance and applicability of research findings to clinical practice. - Group discussions and case studies for practicing critical appraisal skills.
Effective Scientific Writing:	- Principles of scientific writing, including structure, clarity, and precision. - Techniques for organizing and presenting research findings in a coherent manner. - Practice in writing abstracts, research papers, and scientific posters. - Peer review and feedback sessions to improve writing skills.
Research Presentation and Communication:	- Strategies for effective oral and poster presentations of research findings. - Development of presentation skills, including clear communication, visual aids, and audience engagement. - Practice sessions with constructive feedback from peers and instructors.
Integration of Research Skills:	- Application of critical reading and research skills to specific medical topics and case studies. - Collaborative research projects or group assignments to apply learned skills in a practical context. - Opportunities for students to present and discuss their research projects, fostering peer learning and feedback.
Reflection and Self-Assessment:	- Periodic self-assessment to gauge individual progress and identify areas for improvement. - Opportunities for students to reflect on their development of critical reading and research skills throughout the course. - Guidance on further resources, professional development, and opportunities for continued growth in research competence.

Source: developed by the authors' conception

An online learning platform was used to deliver course content, facilitate discussions, and provide access to supplementary resources. This platform allowed students to engage in asynchronous discussions, submit assignments, and access additional learning materials. A collection of research articles from diverse medical specialties, relevant to the students'

academic level, were selected for reading comprehension exercises, critical analysis, and discussions. These articles covered a range of research designs, methodologies, and findings.

Pre- and post-assessment instruments were developed to measure students' critical reading and research skills. These instruments consisted of multiple-choice questions, reading comprehension exercises, research article evaluations, and self-assessment scales to gauge students' perceived improvement in their skills. Pre- and post-intervention questionnaires were used to gather students' demographic information, English language proficiency, prior research experience, and attitudes towards critical reading and research. These questionnaires helped to provide a comprehensive understanding of students' backgrounds and perceptions.

Written consent forms were provided to participants to ensure their voluntary participation in the study and to maintain ethical considerations.

A randomization process was conducted to assign participants to either the control or experimental group. The randomization method and group allocation were documented to ensure fairness and minimize bias.

Research Procedure

The research procedure aimed to investigate the effectiveness of fostering critical reading and research skills in medical students through English for Careers classes. The study involved second-year students from the Medical Faculty of a Medical University, with participants divided into a control group (n=10) and an experimental group (n=11). The following steps were followed:

1) Participant selection: Second-year medical students from the Medical Faculty were recruited for the study. They were informed about the research purpose and provided with an overview of the study requirements. Voluntary participation was emphasized, and written consent forms were collected.

2) Randomization and Group Allocation: A randomization process was conducted to assign participants to either the control or experimental group. The randomization method and group allocation were documented to ensure fairness and minimize bias.

3) Pre-assessment: Both control and experimental groups completed pre-assessment instruments to measure their baseline critical reading and research skills. This included multiple-choice questions, reading comprehension exercises, research article evaluations, and self-assessment scales.

4) English for Careers Classes: The control group received regular English language instruction without specific focus on critical reading and research skills. The experimental group participated in English for Careers classes that integrated critical reading and research skill development. The classes followed a well-structured and tailored curriculum designed to enhance critical reading, research comprehension, and scientific writing abilities. Authentic medical texts, research articles, case studies, and academic writing samples were utilized as course materials.

5) Online Learning Platform: An online learning platform was utilized to deliver course content, facilitate discussions, and provide access to supplementary resources. Both control and experimental groups had access to the platform, but only the experimental group actively engaged in asynchronous discussions, submitted assignments, and accessed additional learning materials related to critical reading and research.

6) Research Article Activities: The experimental group engaged in reading comprehension exercises, critical analysis, and discussions of research articles relevant to their academic level and medical specialties. These activities aimed to improve their ability to understand, evaluate, and synthesize information from scientific literature.

7) Post-assessment: At the end of the intervention, both control and experimental groups completed the same assessment instruments used in the pre-assessment phase to measure their post-intervention critical reading and research skills. The questionnaires were also administered to gather participants' demographic information, English language proficiency, prior research experience, and attitudes towards critical reading and research.

8) Data Analysis: The collected quantitative data from the pre- and post-assessment instruments, as well as the questionnaires, were analyzed using statistical software (SPSS and Excel). The data were organized, calculated, and interpreted to determine the effectiveness of the English for Careers classes in fostering critical reading and research skills in the experimental group compared to the control group.

9) Evaluation and Discussion: The results were evaluated and discussed, considering the improvement in critical reading and research skills observed in the experimental group compared to the control group. The instructional support provided by qualified instructors and the effectiveness of the integrated curriculum were also examined.

10) Conclusion and Recommendations: Based on the findings, conclusions were drawn regarding the effectiveness of fostering critical reading and research skills through English for Careers classes.

Recommendations for further improvement and potential modifications to the curriculum or teaching methods were provided.

Research Ethics:

Ethical considerations are of paramount importance when conducting research involving human participants. In our study, we support the informed consent, confidentiality and anonymity. Participants were provided with a clear explanation of the study's purpose, procedures, and potential risks and benefits. Written consent forms were collected from all participants, ensuring their voluntary participation and informed decision-making. Participants were informed that their participation was confidential and that they could withdraw from the study at any time without penalty.

Participants' identities and personal information were kept strictly confidential. Data collected from participants were anonymized and securely stored, ensuring that individual responses could not be linked back to specific individuals. Confidentiality was maintained throughout the research process and in any subsequent reporting or publications.

Results

The results of the study indicated a significant improvement in critical reading and research skills among the medical students who participated in the English for Careers classes compared to those in the control group.

Quantitative analysis of the pre- and post-assessment data showed a statistically significant increase in the mean scores of the experimental group in various measures of critical reading and research skills. These measures included reading comprehension, research article evaluations, and the ability to critically analyze and synthesize information from scientific literature. On the other hand, the control group, which received regular English language instruction without the specific focus on critical reading and research skills, showed minimal improvement in these areas.

The post-intervention questionnaires provided additional insights into the students' perceptions and attitudes towards critical reading and research. The experimental group reported a higher level of confidence and self-perceived improvement in their critical reading abilities, research comprehension, and scientific writing skills. They expressed greater satisfaction with the integrated curriculum and highlighted the relevance of the course materials and activities in enhancing their research competencies.

The qualitative data collected through open-ended responses and feedback during the study further supported the quantitative findings. The

experimental group reported that the English for Careers classes equipped them with the necessary tools and strategies to critically evaluate research articles, understand research methodologies, and effectively communicate scientific information in writing. They emphasized the value of engaging with authentic medical texts, research articles, and case studies as part of their learning experience.

The results demonstrated that the integration of critical reading and research skills within the English for Careers classes had a positive impact on the development of these competencies in medical students. The findings highlight the effectiveness of a tailored curriculum, instructional support from qualified instructors, and the utilization of diverse course materials in fostering critical thinking, research literacy, and scientific communication skills.

Based on the results, it is recommended that educational institutions consider incorporating similar integrated approaches within their English language programs for medical students. Further research could explore the long-term effects of such interventions and evaluate the transferability of these skills into clinical practice or further academic pursuits.

Discussion and Conclusion

The present study aimed to investigate the effectiveness of fostering critical reading and research skills in medical students through English for Careers classes. The results of the study indicated a significant improvement in critical reading and research skills among the students who participated in the experimental group compared to the control group. This discussion section will further analyze and interpret the findings, highlight their implications, discuss limitations, and suggest areas for future research.

The significant improvement observed in the experimental group can be attributed to several factors. Firstly, the tailored curriculum specifically designed to integrate critical reading and research skills within the English language learning context proved to be effective. The modules on medical literature comprehension, research methodology, critical appraisal, and effective scientific writing provided a structured framework for the students to develop these skills. The use of authentic medical texts, research articles, case studies, and academic writing samples as course materials also contributed to the students' engagement and enhanced their understanding of the research process.

The engagement with research articles and related activities in the English for Careers classes played a crucial role in fostering critical reading and research skills. The reading comprehension exercises, critical analysis, and

discussions of research articles provided opportunities for the students to apply their newly acquired skills in a practical context. By analyzing different research designs, methodologies, and findings, the students were able to develop a deeper understanding of the scientific literature and enhance their ability to evaluate the credibility and relevance of research studies.

The online learning platform used in the study facilitated asynchronous discussions, assignment submissions, and access to supplementary resources. This platform allowed for active participation and self-paced learning, which may have contributed to the students' increased engagement and motivation. The interaction with peers and instructors in the online discussions further enhanced their critical thinking and research skills through collaborative learning and the exchange of diverse perspectives.

The results of the study have important implications for medical education. The development of critical reading and research skills is essential for medical students to become evidence-based practitioners and contribute to advancements in the field. By integrating these skills within the English for Careers classes, medical students can enhance their ability to critically evaluate scientific literature, conduct research, and effectively communicate their findings.

Despite the positive outcomes, there are certain limitations to be acknowledged. Firstly, the study was conducted with a relatively small sample size from a specific medical faculty, which limits the generalizability of the findings. Future research with larger and more diverse samples from different medical institutions would provide a more comprehensive understanding of the effectiveness of this approach.

Additionally, the study focused on the short-term impact of the intervention, and the long-term sustainability of the acquired skills was not evaluated. It would be beneficial to follow up with the participants to assess the persistence of the developed critical reading and research skills and their application in subsequent years of medical education.

Furthermore, the study primarily utilized quantitative measures to evaluate the effectiveness of the intervention. Including qualitative data collection methods such as interviews or focus groups would have provided richer insights into the students' experiences, challenges, and perceptions of the intervention.

In conclusion, this study demonstrates the effectiveness of integrating critical reading and research skills within the English for Careers classes in fostering these competencies in medical students. The tailored curriculum, use of authentic materials, engagement with research articles, and instructional support were instrumental in facilitating the development

of critical thinking, research literacy, and scientific communication skills. The findings support the importance of incorporating similar integrated approaches within English language programs for medical students and suggest avenues for further research in this area.

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