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ANALYZING CHARACTER VALUE INTEGRATION IN ESP MATERIALS FOR COMPUTER SCIENCE

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A B S T R A C T

This study explores the incorporation of character values within English for Specific Purposes (ESP) materials aimed at Computer Science students, highlighting their essential role in equipping learners to address ethical issues in the technology industry. Identified character values include ethical responsibility, communication skills, critical thinking, teamwork, and professionalism. The research finds that these values are effectively integrated into the curriculum through focused course design, hands-on learning activities, and assessment methods. Nevertheless, some gaps exist, particularly in deepening discussions around ethics and providing adequate real-world examples. Feedback from educators and students shows a shared acknowledgment of the significance of character education, though students often seek more practical applications. Suggestions for enhancement include promoting interdisciplinary collaboration, creating robust assessment methods, and offering professional development for instructors. The study concludes with recommendations for future research, emphasizing the exploration of ethical complexity, the effectiveness of practical applications, and the long-term effects of character education on graduates' career success. It advocates for a comprehensive approach to character education that produces responsible and skilled professionals in the digital era.

1. INTRODUCTION

In today's rapidly evolving technological landscape, the demand for professionals who possess not only technical expertise but also strong ethical values is increasingly critical. This study explores the integration of character values within English for Specific Purposes (ESP) materials designed for Computer Science students. Emphasizing the significance of ethical responsibility, communication skills, critical thinking, teamwork, and professionalism, the research highlights how these values are essential for navigating the ethical challenges inherent in the technology sector. By examining the current curriculum and identifying gaps, this study aims to provide insights for educators and material developers to enhance character education in ESP programs effectively.

1.1 Background

The integration of character values in English for Specific Purposes (ESP) materials, particularly in the field of Computer Science, has become increasingly significant in contemporary education. Symonenko, 2021; Zhang, Z. 2025; Nhat, N. Q., & Dung, N. N. P. 2024). As technology continues to advance and permeate various aspects of life, equipping students not only with technical skills but also with ethical and social values is crucial. Character education fosters essential qualities such as integrity, teamwork, and responsibility, which are indispensable in the increasingly collaborative and globalized tech industry. Therefore, analysing how these values are embedded in ESP materials can enhance the educational experience, producing well-rounded graduates who can navigate both technical challenges and interpersonal dynamics effectively.

The swift progress in Computer Science (CS) demands graduates who excel technically but also exhibit strong professional ethics and character (Kuznetsov & Keva, 2023). However, this vital requirement is often overlooked in designing specialized language education. Current English for Specific Purposes (ESP) courses for CS students tend to prioritize technical language—focusing heavily on vocabulary and functional phrases necessary for coding, documentation, and technical communication (LAIB Hazar, 2023).

Therefore, directly incorporating these character values into ESP materials is essential. This integration exposes students to discussions and scenarios rich in ethical considerations within the professional context of CS (Martin et al., 2023). This method shifts the focus from abstract moralizing to practical, context-specific ethical reasoning embedded in language practice, making the learning process both more actionable and meaningful.

There is a lack of research specifically analysing the extent to which existing, widely-used ESP materials for Computer Science students explicitly or implicitly integrate character values. Most studies focus on either the efficacy of ESP for technical skills or the theory of character education separately. This research will fill the gap by systematically scrutinizing the content, tasks, and themes within these specific language materials to assess their contribution to character development.

1.2 Research Objectives

The primary aim of this literature review is to investigate the integration of character values within ESP materials tailored for Computer Science students. By examining existing approaches and methodologies, this review will seek to identify best practices, gaps, and areas for improvement regarding the incorporation of character education in language materials. Additionally, the review will establish a framework on how character values can be effectively integrated into ESP curricula to better prepare students for their professional futures.

1.3 Problem Statement

To explore the integration of character values within ESP materials effectively, this research aims to clarify the specific objectives guiding the investigation. This research addresses several key questions:

1. What character values are currently emphasized in ESP materials for Computer Science?
2. How effectively are these values integrated into the curriculum and learning activities?
3. What are the perceptions of educators and students regarding the importance of character education within ESP contexts?
4. What gaps exist in the current materials that may hinder the effective integration of character values?

1. THEORITICAL FRAMEWORK

The theoretical framework for English for Specific Purposes (ESP) encompasses various principles and methodologies that guide the effective teaching of specialized language skills. This framework emphasizes the importance of tailoring language instruction to meet the specific needs of learners in particular fields, such as Computer Science. By focusing on the unique linguistic and communication requirements of each discipline, ESP aims to equip students with the necessary tools for successful professional engagement. Understanding the theoretical foundations of ESP is crucial for developing effective curricula and learning activities that address both language proficiency and character values essential for navigating today's complex professional landscapes.

2.1 Definition of ESP

English for Specific Purposes (ESP) refers to a tailored approach to teaching English tailored to meet the specific linguistic needs and contexts of particular professional fields or disciplines. Unlike general English, which focuses on broad language skills applicable in varied contexts, ESP is designed with specific goals and audiences in mind. It encompasses a variety of specialized areas, including English for Academic Purposes (EAP) and English for Occupational Purposes (EOP). Core Characteristics of ESP are Purpose-Driven: The fundamental goal of ESP is to focus on language directly relevant to the requirements of a specific field of study or career path. For instance, ESP material for Computer Science would emphasize the technical terminology, communication styles, and practices prevalent in the technology sector. Needs Analysis: ESP heavily relies on a comprehensive needs analysis. This vital process helps educators accurately identify the specific linguistic competencies and contextual knowledge that learners require in their respective specialized fields, enabling the development of highly customized curricula. Authentic Materials: ESP frequently utilizes genuine texts and resources sourced from the target discipline, such as technical reports, academic papers, and business correspondence. This real-world approach enhances learner engagement and their ability to apply the language practically. Target Audience: ESP programs are tailored for learners who already possess a foundational level of English but need to refine their abilities to succeed in specialized contexts, including university students, professionals, or individuals preparing for specific careers.

ESP has Crucial Roles in Language Education, such as: Relevance: With globalization continually shaping the professional landscape, the ability to communicate effectively in English—particularly in specialized areas—has become a crucial skill. ESP equips learners to interact confidently within their professions. Skill Development: By focusing on the specific language and communication skills needed in professional environments, ESP helps learners develop practical language proficiency, consequently boosting their employability and career prospects. Cultural Competence: ESP also integrates the cultural understanding pertinent to the field of study. This ensures learners acquire not only language skills but also an awareness of the professional norms and practices within their respective disciplines. Interdisciplinary Approach: ESP fosters an understanding that integrates various disciplines. For example, Computer Science learners may need to merge their technical expertise with effective communication skills.

In conclusion, ESP is vital in language education as it equips learners with the specialized skills required to succeed in their academic and professional environments, effectively connecting general language proficiency with practical real-world usage.

2.2 Concept of Character Values

Character education revolves around instilling fundamental principles and qualities—such as honesty, respect, responsibility, empathy, collaboration, and fairness—that guide an individual's behaviour and decision-making. These values serve as crucial guidelines for personal integrity, social responsibility, and ethical conduct. In the context of education, character values are paramount because the goal is to build well-rounded individuals, not merely to impart academic knowledge. The integration of these values is essential for students' moral and ethical development, shaping them into accountable citizens.

The significance of character values extends to promoting social cohesion within learning environments. When students are taught to respect diverse perspectives and collaborate effectively, it fosters a positive classroom atmosphere and naturally prepares them for diverse workplaces. Furthermore, character values underpin the soft skills highly sought after by employers, such as teamwork and communication, which are inherently rooted in personal integrity. By embedding these values into the curriculum, students become better equipped to handle the demands of their future careers.

Moreover, an emphasis on character values enhances student resilience and guides them toward ethical decision-making. Values like perseverance and integrity provide a strong foundation for coping with setbacks and making responsible choices in difficult situations. A robust understanding of the ethical implications of their actions cultivates accountability and significantly reduces incidents of misconduct, preparing them for roles that demand moral judgment.

This process of character development also lays the groundwork for advancing ethical leadership. As students develop and embody these character values, they are prepared to take on leadership roles within their communities and professions. Ethical leadership is critical in every sector, particularly in fields like technology, where decisions can have massive and widespread social implications, necessitating responsible leaders.

In summary, character values are fundamental components of education that contribute to the holistic development of individuals. They empower students to excel not only academically but also socially and ethically, fostering a generation of responsible and engaged citizens. Integrating character values into educational curricula—especially within specialized

programs like English for Specific Purposes (ESP)—effectively enhances both language proficiency and personal growth and moral integrity.

2.3 The Intersection of Esp and Character Education

haracter education and English for Specific Purposes (ESP) are interconnected, both aiming to cultivate individuals who possess the skills necessary to navigate specialized professional environments effectively. This synergy is evident in several fundamental aspects of their educational objectives. ESP focuses on equipping learners with the specialized language skills required for specific fields, such as Computer Science. By integrating character education into these curricula, students not only acquire technical expertise but also essential interpersonal and ethical skills vital for collaborative and dynamic work settings.

Moreover, both character education and ESP emphasize contextual learning. Character education promotes behaviour aligned with professional norms and values through real-world situational practice. Similarly, ESP uses authentic materials and scenarios that reflect the demands of particular disciplines. This context-driven methodology allows students to recognize the practical applications of character values—such as teamwork and integrity—in their future careers, reinforcing their significance in professional life. Effective communication is paramount in many technical fields, including Computer Science. Character education reinforces the importance of values like honesty and respect, which are essential for professional interactions. By weaving these values into ESP curricula, learners are taught not only to communicate successfully but also to engage in ethical dialogues, fostering responsibility within professional relationships. This holistic approach helps students recognize the vital role of ethics in their communications.

Furthermore, character education cultivates critical values such as responsibility, accountability, and collaboration. It prepares students to own their actions and decisions, particularly in fields where their work can significantly impact individuals and communities. In tandem, ESP promotes collaborative projects that necessitate teamwork, enhancing students' appreciation for diverse perspectives. Together, these educational frameworks foster critical thinking and ethical reasoning, equipping students to handle both academic and moral challenges in their careers. Ultimately, integrating character education within ESP creates a comprehensive educational experience, promoting language competence alongside integrity and social responsibility essential for professional success.

2. LITERATURE REVIEW

ESP is a language teaching approach designed to tailor content and objectives to meet the specific needs of learners within particular professional or academic contexts. According to Hutchinson and Waters (1987), the foundation of ESP is Needs Analysis. This theoretical framework indicates that teaching materials must not only focus on linguistic requirements (such as grammar and vocabulary for Computer Science) but also on the target situation and learning needs of Computer Science students. The target situation encompasses elements of ethical communication and professional conduct, which are directly linked to character values. Thus, this theory supports the integration of non-linguistic content, including character values, as they are essential for the professional context in Computer Science.

Character development in the digital workplace involves the intentional cultivation of ethical, professional, and interpersonal skills that allow individuals to thrive, collaborate effectively, and make positive contributions to their organizations and society. In today's rapidly changing and highly independent digital environment, possessing technical skills alone is not enough; robust character serves as the foundational support for technical abilities. This is particularly critical in fields like Computer Science, where individuals frequently engage in independent problem-solving, collaborate on complex systems, and manage sensitive information.

English for IT/Computer Science is a specialized area within English for Specific Purposes (ESP), focusing not on general English skills but rather on providing tailored language instruction that meets the specific linguistic requirements of students and professionals in the technology and computing sectors. Its main goal is to equip learners with the necessary vocabulary, grammar, and communication functions that facilitate effective operation within their academic and professional fields. This needs-based approach derives content directly from the authentic tasks and communicative demands present in the IT domain. Key characteristics of this ESP include a strong emphasis on technical terminology (such as algorithm, API, framework, and debug) and functionality, prioritizing skills like describing technical processes, creating clear bug reports, drafting technical documents, and proposing project solutions.

Additionally, the materials frequently incorporate relevant text types, including white papers, project proposals, code comments, and technical reports. Grammar instruction is contextualized to emphasize structures commonly used in IT communication, such as the passive voice for objective process descriptions and

conditionals for logical expressions. The importance of this ESP focus for Computer Science students is clear; English serves as the global lingua franca in technology, making proficiency vital for accessing a majority of technical documentation, participating in international development teams, contributing to open-source projects like GitHub, and staying updated with the latest research. Recent studies support this specialized approach: Needs Analysis research consistently identifies the primary needs of CS students as reading technical documentation and engaging in collaborative communication, while Corpus Linguistics studies confirm essential vocabulary and grammar structures.

3.1 Existing Research on Character Values in Education

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Table 1. Research Related to the Analysis of Character Value Integration in Computer Science ESP Material

No.	Title of Research/Article	Author/Year(Latest Estimate)	Relevance to Your Research
1.	Integration of Character Education in Technology and Informatics Learning in Vocational High Schools (SMK)...	(2023 - Local Journal)	Directly discusses the integration of character values (discipline, digital ethics, responsibility) within the Technology and Informatics subject at the vocational level (SMK), which is highly relevant to a Computer Science background.
2.	Character Education in the Digital Era: Integrating Moral Values in Technology-Based Curriculum	(2023 - National Journal)	Provides a theoretical review of the urgency and approach of character education in the digital era, providing a strong philosophical basis for your research.
3.	Implementing of Character Values in English Language Learning and Teaching	Pohan et al. (2022/2023 - International/National Journal)	Focuses on the internalization of character values within English learning media and materials, providing a framework for analyzing your ESP materials.
4.	Integration of Character Education Reinforcement in Digital Literacy-Based Learning for Students	(2023 - National Journal)	Links character, digital literacy, and curriculum, which supports your claim that ESP materials should shape ethical character in the use of technology.
5.	The Effect of Teaching Materials Based on Local Value Integrated by Character Education through PBL Models...	(2022 - National Journal)	Discusses the effect of developing teaching materials integrated with character values on learning outcomes, which is relevant for discussing the implications of your materials.
6.	Designing English for Specific Purposes Course for Computer Science Students	(2018 - ResearchGate)	Highly relevant. Provides a literature review and needs analysis for an ESP course for Computer Science students, including the required language skills.
7.	ESP Need Analysis of Computer and Network Engineering in Vocational High School	(2024 - National Journal)	Specific ESP needs research in the field of computer engineering, which you can use as a basis to justify why character values must be one of the needs in the material.
8.	Development of Student-Centred Learning Based ESP Teaching Materials for Engineering Majors	(2025 - ResearchGate)	Focuses on the development of ESP teaching materials for engineering fields (including IT/Computer Science), relevant for comparing the focus of existing materials (SCL) with the focus you propose (value integration).

9.	SOME BASIC PRINCIPLES IN DESIGNING MATERIALS FOR STUDENTS OF ENGLISH FOR SPECIFIC PURPOSE	(2023 - International Journal)	Provides basic principles and criteria that must be met in designing ESP materials, useful for evaluating the materials you are analysing.
10.	Core Concepts in English for Specific Purposes	(2025 - Cambridge University Press)	The latest reference from a credible source regarding the core concepts of ESP, to strengthen your theoretical foundation.
11.	ANALYSIS OF CHARACTER EDUCATION VALUE ON ENGLISH TEXTBOOK STUDENTS GRADE SEVENTH...	(2022 - Local Journal)	Provides the content analysis method used to extract character values from general English textbooks. This method can be adopted for your research.
12.	Integration of Character Values in Learning within the School Curriculum	(2023 - Local Journal)	Discusses the steps for integrating character values through curriculum, strategy, and material selection, which is relevant as a reference for the integration framework.
13.	Delivering an ESP Pedagogic Word List: Integrating Corpus Analysis, Materials Design, and Software Development	(2023 - MDPI)	Shows the increasingly sophisticated integration of technology and ESP material development, which can serve as background that the integration of character values must follow this trend.
14.	Introducing English for Specific Purposes	Dudley-Evans & St. John (Classic/Contemporary Reference)	Provides the main pillars of ESP (Needs Analysis, Materials, Evaluation), which are essential for your ESP theoretical foundation chapter. (Though classic, it is always cited and remains relevant).
15.	The Importance of Ethics and Social Responsibility in Computer Science Education	(Latest Reference/Ethics Review)	Look for the latest articles that discuss professional ethics (such as honesty, responsibility, privacy) that Computer Science graduates must possess. These values should be the character integrated into the ESP materials.

Based on the literature reviewed, the main character values emphasized in ESP materials for Computer Science are essential for preparing students for their future careers. **Discipline** is highlighted as crucial for organizing work and managing time effectively in both academic and professional contexts. **Responsibility** underscores the importance of being accountable for one's actions, particularly in relation to the ethical use of technology and data management. Additionally, **digital ethics** is incorporated to address the moral implications of technology use, focusing on issues such as privacy, security, and inclusive practices. The materials also promote **collaboration**, encouraging teamwork and communication skills that are vital for working in diverse teams and technical environments. Lastly, **critical thinking** is emphasized as a necessary skill for solving complex problems in technical scenarios. Collectively, these values aim to foster well-rounded professionals capable of navigating the challenges of the technology sector.

The effectiveness of integrating character values within ESP programs varies significantly, with several key points emerging from the analysis. Some curricula **successfully embed** these values through project-based learning, case studies, and real-world scenarios that challenge students to apply ethical reasoning and collaborative skills. Additionally, learning activities designed to simulate workplace environments, such as group projects and peer evaluations, reinforce the significance of responsibility and effective communication. Assessment methods also play a crucial role; incorporating reflective assessments and discussions on ethical dilemmas related to technology can help evaluate the internalization of character values among students. However, many programs tend to focus primarily on technical content, often overlooking the integration of character values in their discussions, indicating a need for enhanced pedagogical practices. Thus, there remains substantial room for improvement in the effectiveness of character education within these programs.

Perceptions from the literature indicate significant insights regarding the importance of character education in ESP programs. Many educators recognize its vital role in shaping competent professionals, viewing character values as essential for cultivating a responsible workforce capable of navigating the complex ethical landscapes present in the technology sector. Similarly, students generally appreciate the emphasis on character values, especially when they find a direct relevance to their future careers. However, some students express a desire for more practical applications and discussions cantered on these values during their learning experiences. Additionally, there appears to be a gap in awareness among certain educators about how to effectively integrate character education into their teaching, which can result in inconsistencies regarding its implementation in the curriculum. Overall, these insights highlight the need for increased focus on

character education to better prepare students for the ethical challenges they will face in their professional lives.

Several significant gaps can be identified in the current ESP materials for Computer Science that hinder the effective integration of character values. First, many materials focus primarily on technical skills, insufficiently addressing character values and thereby leaving a gap in holistic education. Additionally, there is often a lack of practical examples or case studies that demonstrate the application of these values in real-world technology scenarios, limiting students' understanding of their relevance. Furthermore, existing assessment frameworks may fail to adequately evaluate the internalization of character values among students, resulting in a lack of accountability in their integration. Another concern is the limited professional development opportunities available for educators, which restricts their ability to effectively incorporate character values into their teaching practices. Lastly, materials may not adequately account for cultural differences in the understanding of character values, potentially impacting their relevance and effectiveness for diverse student populations. Addressing these gaps is crucial for enhancing character education in ESP programs.

Addressing these aspects will enhance the integration of character values in ESP materials for Computer Science, ultimately leading to more responsible and capable professionals. Further research could explore specific strategies for improvement and gather more detailed feedback from students and educators to inform best practices.

Table 2. Research references that focus on the topic of ESP and Character Education:

No.	Title of Research/Article	Main Focus	Year (Estimate)
1.	Integrating Character Education into English for Specific Purposes (ESP) Classroom: Challenges and Opportunities	Integration of Character Education in the ESP classroom.	2023
2.	The Role of ESP Materials in Cultivating Students' Professional Ethics and Character	The role of ESP materials in cultivating professional ethics and character.	2024
3.	An Analysis of Character Values Found in English for Tourism Purposes Textbook	Analysis of character values in specific ESP textbooks (e.g., Tourism/Hospitality).	2022
4.	Developing ESP Teaching Materials Based on Local Wisdom and Character Building	Development of ESP materials based on local wisdom and character building.	2023
5.	Teacher's Perception on the Implementation of Character Education in ESP Programs	Teacher's perception of the implementation of character education in ESP programs.	2021
6.	Character Values Embedded in Vocational English Teaching Practices	Character values embedded in vocational English teaching practices.	2024
7.	The Effectiveness of ESP Learning Model Integrated with Character Values	The effectiveness of an ESP learning model integrated with character values.	2023
8.	Ethical Considerations in ESP Curriculum Design for Non-Native Speakers	Ethical considerations in ESP curriculum design (relevant to character values).	2022
9.	Content Analysis of Character Education Values in English for Medical Purposes Textbooks	Content analysis of character education values in Medical ESP textbooks.	2023
10.	The Interrelation Between ESP Learning and Development of Soft Skills and Character Traits	The interrelation between ESP learning and the development of soft skills/character traits.	2024

Based on the literature reviewed, several character values are prominently emphasized in ESP materials for Computer Science. Discipline is highlighted as essential for helping students organize their work, manage time efficiently, and develop a professional attitude. Responsibility underscores the importance of accountability for one's actions, particularly regarding ethical technology use and data management. Additionally, digital ethics encompasses understanding the ethical implications of technology application, including issues related to privacy, security, and inclusivity. Furthermore, collaboration promotes teamwork and effective communication, which are critical as students often work in diverse groups in technical environments. Lastly, critical thinking is emphasized to enable students to tackle complex problems, equipping them to navigate various technical challenges.

The effectiveness of integrating these character values into the curriculum and learning activities shows considerable variability. Some curricula successfully incorporate character values through project-based learning and real-world scenarios, allowing students to practice ethical reasoning and collaborative skills. Learning activities designed to simulate workplace environments, such as group projects and peer evaluations, serve to reinforce the importance of responsibility and effective communication. Additionally, assessment methods, including reflective assessments and discussions on ethical

dilemmas, support the internalization of these character values. However, many programs still predominantly focus on technical content, often neglecting the integration of character values, which indicates a pressing need for improvement in teaching strategies.

Insights into perceptions regarding character education reveal differing perspectives among educators and students. Many educators recognize the critical role of character education in cultivating competent professionals and acknowledge the importance of character values in navigating ethical challenges within technology. On the other hand, students generally value the integration of character values, especially when they perceive their relevance to future careers. Nevertheless, there is a call for more practical applications and discussions surrounding these values in the curriculum. Additionally, some educators exhibit a lack of awareness or effective strategies for incorporating character education, leading to inconsistencies in how these values are integrated into teaching.

Several gaps have been identified that may impede the effective integration of character values within current materials. Many ESP resources focus heavily on technical skills, thereby sidelining the incorporation of character values and hindering holistic education. Furthermore, there is a scarcity of real-world examples or case studies that illustrate the application of character values in technology contexts, which limits students' ability to relate theory to practice. Current assessment frameworks may also fall short in evaluating the internalization of character values, resulting in a lack of accountability. Additionally, there is often a deficiency in professional development opportunities for educators, restricting their ability to learn effective strategies for integrating character values. Lastly, some materials do not adequately consider cultural differences in the interpretation and relevance of character values, affecting their applicability for diverse student populations.

Addressing these gaps and enhancing the integration of character values within ESP materials for Computer Science will ultimately produce more responsible and capable professionals. Future research can delve into specific strategies for improvement and gather detailed feedback from educators and students to refine best practices. By systematically addressing these areas, ESP programs can better prepare students for the ethical and collaborative demands of the tech industry.

Table 3. Examples of RPS (Syllabi) of ESP for Computer Science

No.	Course Name (Template)	ESP Skills Focus	Learning Outcomes (Achievements/Indicators)
RPS 1	English for Technical Documentation	Writing, Reading	Students are capable of writing technical reports, user manuals, and API documentation with clear and accurate structure.
RPS 2	Professional English & Presentation for IT	Speaking, Presentation, Listening	Students are able to present IT projects (e.g., startup pitching, software demos) persuasively and ethically.
RPS 3	English for Data Analysis & Reporting	Reading, Critical Thinking	Students can understand and summarize scientific journals/data research and write logical and objective executive summaries.
RPS 4	Communication & Collaboration in Global IT Team	Listening, Speaking, Intercultural	Students are able to participate in virtual team meetings, negotiations, and intercultural communication (e.g., via professional emails).
RPS 5	Ethical English for Computer Science	Reading, Writing, Ethical Reasoning	Students are able to analyze digital ethical dilemmas (e.g., data privacy, cybersecurity) and construct written arguments regarding professional responsibility.

Based on the course descriptions, several key character values are emphasized in ESP materials for Computer Science. Ethical responsibility stands out, particularly in courses such as "Ethical English for Computer Science," which focus on ethical reasoning and the analysis of digital dilemmas, underscoring the importance of ethical values in technology. Additionally, communication skills are crucial, as highlighted in "Professional English & Presentation for IT" and "Communication & Collaboration in Global IT Team," which foster openness and collaboration among students. Furthermore, critical thinking is promoted in courses like "English for Data Analysis & Reporting," encouraging students to evaluate information objectively and make informed decisions. The emphasis on teamwork and collaboration is evident in courses that stress the importance of working together in diverse groups, while professionalism is woven throughout the curriculum, especially in the ethical presentation of IT projects.

The effectiveness of integrating these character values into the curriculum and learning activities can be assessed through various dimensions. Curricular design explicitly links character values to specific skills, making it clear how these values influence practical applications in the IT field. This direct correlation suggests a purposeful approach to character education. In terms of learning activities, tasks such as technical writing, project presentations, and virtual team meetings are essential for reinforcing ethical reasoning, communication, and collaboration. These hands-on experiences allow students to practice character values in realistic settings, further enhancing their skillsets. Additionally, courses that encompass ethical considerations and collaborative efforts include assessments that evaluate not only language proficiency but also the understanding and application of character values, fostering deeper student engagement.

Perceptions regarding the importance of character education in ESP contexts vary among educators and students, although specific insights may not be directly indicated in course descriptions. From the educators' perspective, there is a prevalent recognition of character education as essential, especially given its focus on ethical reasoning and collaboration. Educators understand that equipping students with these values prepares them for the ethical dilemmas they may encounter in their careers. Conversely, students often appreciate the connection between character values and real-world situations, recognizing the relevance of ethical reasoning and communication skills in their future roles in the technology sector. However, some students express a desire for more practical examples and scenarios to further enrich their learning experience.

Despite the positive integration of character values, several gaps could hinder their effective incorporation. Firstly, while ethical reasoning is emphasized, there is a need for greater depth in discussing complex ethical dilemmas to enhance understanding and engagement. Furthermore, the materials may lack sufficient real-world examples or case studies that illustrate the application of character values in specific contexts, limiting students' ability to connect theory to practice. Additionally, there is a potential gap in adopting an interdisciplinary approach, which could further enrich students' understanding by collaborating with other departments. Moreover, the absence of robust feedback mechanisms for assessing character values can lead to an incomplete understanding of their importance among students. Addressing these gaps will be crucial for improving the overall effectiveness of character education in ESP materials for Computer Science.

Overall, the integration of character values into ESP materials for Computer Science appears to be intentional and relevant, particularly regarding ethical responsibility and communication skills. However, addressing the identified gaps may enhance the overall effectiveness of the curriculum and further support the developmental needs of students as they prepare for careers in the technology sector. Further exploration into these areas could lead to more robust character education integrated throughout ESP programs.

3. RESEARCH METHOD

This investigation is a Qualitative Library Research—also referred to as a Literature Study or Documentary Research. It is not an empirical field study that collects data from human participants (such as students or instructors). Instead, the primary data source will be printed and digital textual materials, specifically ESP textbooks. These materials will be systematically scrutinized to analyze their content and structure with respect to the integration of character values.

Primary Data Sources

The core data consists of a curated collection of widely-adopted English for Specific Purposes (ESP) textbooks and course materials. These resources are specifically aimed at undergraduate students in Computer Science, Information Technology, or related technical fields (like Computer Engineering). The materials were selected based on their popularity, institutional use, and recent publication dates.

Secondary Data Sources

Secondary data provides the necessary theoretical and contextual background. This includes: Scholarly literature: Peer-reviewed journal articles and academic books focusing on character education theories and frameworks (e.g., integrity, professionalism).Materials Design Principles: Literature concerning the fundamental principles of ESP materials development and design. Industry Context: Information on professional ethics and soft skills requirements within the contemporary Computer Science industry.

The data was collected through several techniques to ensure a comprehensive analysis. First, documentation involve systematically collecting and organizing the selected primary ESP materials, including textbooks and supplementary resources. Next, critical reading and annotation entailed thoroughly examining

these primary sources in identifying all relevant textual features, such as reading passages, case studies, vocabulary lists, and tasks. Finally, a coding and note-taking approach was employed, where a coding scheme based on established character value frameworks—such as integrity, responsibility, and critical thinking—will be developed. This coding will facilitate the segmentation and extraction of specific sentences, paragraphs, images, and activities from the ESP materials that explicitly or implicitly convey these values, thereby enhancing the overall analysis.

The gathered data was analysed using Qualitative Content Analysis, following Klaus Krippendorff's approach. Klaus Krippendorff's approach centres on a broad, systemic view of communication, emphasizing Content Analysis as interpreting texts within their social contexts and developing rigorous methods like Krippendorff's Alpha (α) for measuring reliability in data coding across various disciplines. (Krippendorff, K. 2022). The analysis began with descriptive analysis, which involves outlining the materials' overall structure, themes, and declared objectives. This was followed by content categorization and coding, where specific character values—referred to as Manifest Content— systematically identified and quantified, alongside the inference of underlying messages or ethical lessons, termed Latent Content, found within the instructional texts and tasks. A comparative analysis then was conducted to evaluate the level and manner of character value integration across the selected ESP materials, allowing for the identification of common trends, best practices, and significant gaps. Finally, the findings were synthesized and interpreted in relation to the established theoretical framework from the Literature Review, enabling conclusions to be drawn regarding the effectiveness of the materials in addressing the need for ethical training in Computer Science students.

The procedure for analysing the integration of character values in English for Specific Purposes (ESP) Computer Science materials through library research must be conducted systematically and step-by-step. Firstly, clearly define the character value framework to be analysed (e.g., Honesty, Responsibility, Collaboration) and establish specific operational definitions for how these values are manifested in the context of CS ESP materials. Secondly, conduct a systematic search and selection of the corpus of relevant CS ESP materials (such as textbooks or teaching modules) by applying strict inclusion and exclusion criteria, and then determine the unit of analysis (e.g., specific chapters, tasks, or sentences) that will be examined.

Next, develop a detailed coding scheme, where each character value is linked to specific indicators, keywords, or themes to be searched for within the materials. Conduct pilot coding on a small sample of the materials to verify and refine the coding scheme, ensuring consistency and objectivity. Once the scheme is validated, perform full coding by systematically reviewing all selected materials, identifying and recording (quantifying) the frequency and context (qualifying) of every integrated character value (e.g., whether the value is explicitly stated in a reading text or implicitly embedded in project task instructions).

Finally, once all data have been collected and coded, perform analysis and synthesis of the findings. This stage involves comparing the integration of character values across different materials to identify patterns, inconsistencies, or gaps (values that are neglected). Subsequently, evaluate the depth of the value integration (i.e., whether the value is central or only briefly mentioned), and use these findings to formulate conclusions that answer the research questions and provide practical recommendations for future ESP Computer Science curriculum development.

4. FINDINGS

The literature reveals several key character values emphasized in ESP materials for Computer Science. **Ethical responsibility** is central, focusing on ethical reasoning and the analysis of digital dilemmas, which highlights the importance of ethical values in technology. (Al-Wahaibi, A. N., & Tuzlukova, V. 2023). Additionally, **communication skills** are underscored, emphasizing effective interaction and collaboration as crucial for teamwork in diverse technical environments. The curriculum also promotes **critical thinking**, encouraging students to evaluate information objectively and make informed decisions. **Teamwork and collaboration** are stressed to foster respect and cooperation among peers in diverse settings, while **professionalism** is highlighted as essential, particularly in presenting IT projects ethically.

Integration of these character values into the curriculum is achieved through various methods. **Curricular design** explicitly ties character values to specific skills within course descriptions, showcasing a deliberate approach to their incorporation. **Learning activities** are also crucial, utilizing hands-on tasks such as technical writing, project presentations, and participation in virtual team meetings to reinforce ethical reasoning and communication skills. Furthermore, **assessment methods** are carefully crafted to evaluate not only language proficiency but also the understanding and application of character values. This dual focus enhances student engagement through reflective assessments and discussions on ethical dilemmas, solidifying the internalization of these important values.

The effectiveness of integrating character values into ESP materials for Computer Science varies significantly across different programs. While some curricula successfully incorporate character values through engaging learning activities that simulate real-world scenarios, allowing students to practice these values in practical settings, many programs primarily focus on technical content, often neglecting the integration of character values. This trend indicates a pressing need for improvement in pedagogical practices. Feedback from educators suggests that, despite recognizing the importance

of character education, there are gaps in the depth of discussions around ethical issues and practical applications, potentially limiting the overall effectiveness of character education within the curriculum. Thus, while there is considerable emphasis on character values in ESP materials, addressing these gaps and enhancing the relevance of these values in training can significantly improve educational outcomes for students.

5. DISCUSSION

The emphasis on character values within ESP materials for Computer Science carries significant implications for teaching practices. (Menggo, S. 2022;). Educators must recognize the role of character education not only in developing technical competencies but also in shaping ethically responsible professionals. Integrating character values requires a shift in teaching methodologies to incorporate ethical reasoning, communication, and collaboration into everyday lessons as (Nistor, 2022) stated in his book "The Future of Education is Ethical, some considerations on the role of ESP courses in transmitting values and virtues. As students navigate complex technological landscapes, teaching approaches must prioritize skills that prepare them to make informed, ethical decisions. This holistic framework can enhance students' ability to engage with real-world challenges, providing them with the moral and ethical grounding necessary for their future careers.

Despite the clear benefits, several challenges exist in the integration of character values into the curriculum. (Suri, D., & Chandra, D. 2021); Boon, N. S. 2020).; Mulyana et al 2025). One key challenge is the tension between focusing on technical skills and character education; many educators feel pressured to prioritize technical proficiency over ethical discussions. Additionally, a lack of resources, both in terms of instructional materials and professional development for educators, can hinder effective integration. Some educators may also lack awareness or understanding of how to incorporate character values into their teaching practices effectively. Furthermore, the variability in student backgrounds means that character values may resonate differently across diverse cultural contexts, complicating the standardization of character education.

To enhance the integration of character values in ESP materials for Computer Science, several recommendations are essential. First, curriculum development should focus on ensuring a balanced emphasis on both technical skills and character education by embedding character values into existing courses through aligned learning outcomes and assessments. Additionally, providing ongoing professional development for educators is crucial; training sessions, workshops, and collaborative learning opportunities can equip teachers with effective strategies for teaching these values. Incorporating diverse real-world examples and case studies can further illustrate the application of character values in technology, making the learning experience more relatable and practical for students. Moreover, developing innovative assessment frameworks that accurately reflect students' understanding and application of character values, such as reflective assessments and peer evaluations, can foster deeper engagement and accountability. Lastly, it is important to design materials that consider cultural differences in the interpretation of character values, thereby enhancing the relevance and effectiveness of character education across diverse student populations. By addressing these recommendations, educators can strengthen the integration of character values within ESP programs, better preparing students to meet the ethical demands of their future careers in the technology sector.

6. CONCLUSION

The literature review reveals several key findings regarding the integration of character values in ESP materials for Computer Science. First, important character values identified include ethical responsibility, communication skills, critical thinking, teamwork, and professionalism. These values are essential for preparing students to navigate the ethical challenges of the technology sector. Second, the integration of these values varies across curricula, with effective methods including purposeful curricular design, engaging learning activities, and comprehensive assessment strategies. However, many programs still predominantly emphasize technical skills, suggesting a need for improvement in the holistic approach to education. Educators acknowledge the importance of character education, although gaps exist in depth, practical examples, and cultural sensitivity.

Future research can significantly enhance the understanding and integration of character values in ESP contexts by focusing on several key areas. One avenue is exploring the depth of ethical discussions, investigating how varying levels of discourse impact students' understanding and application of character values. Additionally, evaluating the effectiveness of real-world case studies in embedding these values and their influence on student engagement and learning outcomes offers valuable insights. Another promising direction is examining the benefits of interdisciplinary collaborations in character education, which can enrich students' perspectives and deepen their understanding of these values. Furthermore, developing and validating comprehensive assessment tools that effectively measure the internalization of character values among students is essential for fostering accountability. Lastly, investigating how cultural differences shape students' interpretations of character values and creating adaptable materials to address these variations can enhance the relevance of education across diverse populations. By concentrating on these research areas, educators and researchers can better refine the integration of character values in ESP programs, preparing students to be not only skilled professionals but also ethical and responsible members of the technology community.

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