Enhancing student performance through MOOCs: An analysis of the impact of Massive Open Online Courses on academic achievement

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Abstract

This study investigates the impact of the Massive Open Online Course (MOOC) "English for IT: Mastering Computing Basics," delivered by the International Information Technology University (IITU) via Coursera, on the development of English language proficiency among STEM students. The research compares the performance of second-year pre-intermediate level students in the 2024-2025 academic year who participated in the course, with a control group from the previous academic year (2023-2024), which did not incorporate the MOOC component. The study evaluates the influence of the MOOC on students' reading, speaking, and listening skills, with a particular focus on technical language use in IT contexts. Quantitative data, including performance on assessments and a final speaking test, reveal modest improvements in language proficiency, especially in technical vocabulary. The qualitative analysis, based on a closed-ended survey, provides insights into student perceptions of the course's effectiveness in enhancing language competences. Findings indicate that a majority of participants reported significant gains in reading and listening abilities, with moderate improvements in speaking and lexical competence. The results suggest that the integration of digital learning tools, such as MOOCs, has the potential to supplement traditional language instruction and contribute to the enhancement of language proficiency in specialized fields like IT. However, further refinement of course content and delivery methods is recommended to address varying learner needs and maximize the efficacy of such digital interventions in language education.

Keywords

English for IT, MOOCs, language proficiency, STEM education, digital learning, Coursera, IITU, technical English, reading, speaking, listening, survey

1. Introduction

In recent years, education has undergone a profound transformation with the advent of online learning platforms. Among these, Massive Open Online Courses (MOOCs) have emerged as influential educational tools, democratizing access to high-quality resources for millions of learners worldwide. MOOCs are online courses designed to support unlimited participants, providing open access to various educational materials, often in partnership with reputable universities and institutions. Initially introduced to expand learning opportunities beyond geographical and financial limitations, MOOCs have since evolved into a major educational resource, drawing learners from diverse backgrounds and offering unique opportunities for personal and professional growth [1]. However, the impact of MOOCs on formal educational outcomes, specifically academic achievement, remains an area requiring further exploration [2]. As universities consider integrating MOOCs into their curricula, understanding how these courses affect student performance in traditional educational settings is essential.

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While much research has examined MOOC engagement patterns, course completion rates, and user demographics [3], few studies have focused directly on the academic performance outcomes for university students who engage in MOOCs. This study addresses this gap by exploring the impact of MOOC participation on academic achievement among university students, with a focus on understanding how MOOCs might support or enhance traditional learning environments. One core motivation behind this research is to evaluate the potential of MOOCs as complementary educational tools that can address resource constraints faced by many universities, particularly in under-resourced regions. MOOCs offer an accessible way for students to learn from renowned institutions without geographical restrictions, making them particularly relevant for students in developing countries or institutions with limited resources [4].

The aim of this study is to analyze the relationship between MOOC participation and academic achievement through a mixed-methods approach, focusing specifically on the recent integration of MOOCs into the curriculum. This study employs quantitative analysis to compare the academic records of students who participated in MOOCs with those who did not, with data drawn from students in the last academic year who did not engage in MOOC courses, compared to students from this academic year where MOOC courses were integrated into lessons. This comparison seeks to determine if statistically significant differences exist between these groups, particularly regarding academic performance indicators such as attestation 1 and attestation 2 and course completion rates. This empirical basis aids in evaluating the potential impact of MOOC participation on academic success.

In addition to the quantitative analysis, qualitative data are collected through surveys, designed to capture students' subjective experiences, motivations, and challenges associated with MOOC engagement. Combining objective performance metrics with students' personal perspectives, this dual approach offers a comprehensive examination of both measurable outcomes and experiential aspects of MOOC participation [5].

The theoretical framework of this study draws from constructivist and self-determination theories. Constructivist theory emphasizes active, self-directed learning, where students construct knowledge through interaction with content and resources [6]. MOOCs align with constructivist principles by fostering a learner-centered approach, allowing students to engage with materials independently, apply new knowledge, and assess their understanding without constant guidance. Similarly, self-determination theory highlights the importance of intrinsic motivation, autonomy, and competence in fostering successful learning outcomes [7]. MOOCs offer a flexible learning environment that may support intrinsic motivation by providing students with control over their learning pace, content selection, and engagement methods. This study examines how these motivational and cognitive factors play a role in academic success among students who participate in MOOCs [8].

To further expand on the theoretical framework, constructivist theory suggests that learners are active participants in their education, drawing upon prior knowledge and experiences to form new understandings. This active engagement is particularly relevant in the MOOC environment, where students are required to navigate course materials independently, manage their time effectively, and apply what they learn to practical or theoretical tasks [9]. MOOCs create an interactive platform for students to access a wealth of resources, discussions, and assignments that allow for varied forms of knowledge construction. The absence of traditional in-person guidance is counterbalanced by peer interaction, forum discussions, and multimedia content that collectively support knowledge construction through diverse perspectives and contexts [10]. In this way, MOOCs provide a constructivist learning ecosystem, enabling learners to build understanding at their own pace while still engaging with a larger learning community.

Self-determination theory, on the other hand, focuses on the role of intrinsic motivation, autonomy, and competence as essential elements for effective learning. This theory posits that when individuals feel a sense of autonomy, they are more likely to engage in self-motivated learning behaviors, setting personal goals and navigating their learning journey independently. MOOCs support these needs by offering extensive flexibility and learner autonomy, allowing students to

select courses that align with their interests, manage their progress, and complete tasks in an order that suits their preferences. Moreover, MOOCs often incorporate self-assessment tools, enabling students to evaluate their comprehension and competence levels actively. This self-regulatory capability aligns with self-determination theory's emphasis on competence as students build their self-efficacy through gradual mastery of complex concepts [11].

The interactive and self-paced nature of MOOCs allows learners to gain a sense of ownership over their education, a factor that has been linked to increased intrinsic motivation and greater academic persistence [12]. Fostering an environment where students can work at their own speed, revisit challenging concepts, and access supplementary resources, MOOCs align closely with both constructivist and self-determination theories, making them potentially effective tools for enhancing student engagement and academic success. This study's framework will explore how these theories manifest in the MOOC learning context and contribute to measurable academic outcomes.

The methodology of this research involves a mixed-methods design, incorporating quantitative and qualitative data to explore the impact of MOOCs on student performance thoroughly. The quantitative aspect involves analyzing the academic records of 434 university students, examining any correlations between MOOC participation and academic indicators. This analysis will offer objective insights into the extent to which MOOCs may influence academic performance. The qualitative component, on the other hand, involves surveys aimed at understanding students' experiences and perceptions of MOOCs. Survey questions will focus on motivations for enrolling, perceived benefits and challenges, and satisfaction with MOOC learning [13]. Through this approach, the study captures the multifaceted effects of MOOC participation on both academic performance and student engagement.

This research has significant implications for the evolving role of online learning in higher education. If findings indicate that MOOCs positively impact academic performance, universities may consider integrating MOOCs into formal curricula, potentially offering credit or recognizing MOOC-based learning achievements. Understanding the motivational factors that drive students to engage with MOOCs could also inform the design of more effective online learning experiences, aligned with students' intrinsic motivations and academic goals [14]. For MOOC providers, these insights can help improve course design, enhance learner support, and optimize content delivery to meet diverse educational needs.

The study seeks to contribute to the broader discourse on the integration of online learning in higher education. Through the analysis of the impact of MOOCs on academic achievement, it provides a deeper understanding of how digital learning resources can complement traditional educational practices. With the growing demand for accessible, flexible education options, MOOCs have the potential to become a valuable resource for promoting student success and supporting academic development. Through this research, we aim to offer evidence-based recommendations for educators, institutions, and policymakers on the effective utilization of MOOCs to enhance learning outcomes and academic achievement.

2. Literature review

The rise of digital learning platforms, particularly MOOCs (Massive Open Online Courses), has led to a re-examination of how language competencies, such as lexical competence, reading and listening competence, and speaking competence, are developed in the online learning context. Given the flexibility and accessibility MOOCs provide, they have become a widely adopted method for improving language proficiency and academic competencies among students globally. However, there remains a need for a deeper understanding of how MOOCs impact specific language competencies, especially as these platforms increasingly complement traditional educational settings.

The surge in MOOCs has transformed the traditional landscape of language learning by offering courses that reach a broad and diverse global audience, allowing learners to acquire language skills at their own pace and from any location. These platforms provide a range of resources such as

interactive video lectures, quizzes, discussion forums, and peer feedback, which contribute to developing essential language competencies. Lexical competence, for instance, benefits from the exposure to extensive vocabularies across various topics, while reading and listening competencies are enhanced through structured activities that encourage comprehension and retention. Speaking competence, which is often challenging to cultivate in digital spaces, is supported by innovative tools like speech recognition software and virtual interaction rooms, enabling students to practice and refine their spoken language skills.

Despite these advancements, challenges remain. Research suggests that the effectiveness of MOOCs in fostering language skills largely depends on the platform's design and the active involvement of learners [15]. Engagement, for example, can vary significantly, as some learners struggle with maintaining motivation and completing self-directed online courses. The lack of real-time feedback in some MOOCs may limit students' ability to make immediate corrections and adapt their language use. Thus, while MOOCs offer unprecedented opportunities to expand language learning accessibility, optimizing their structure to support diverse learner needs is essential. Future studies should explore personalized learning paths and enhanced interactive elements to better align MOOCs with traditional language learning environments and meet the complex requirements of effective language acquisition.

2.1. Lexical competence

Lexical competence refers to a learner’s ability to understand and use vocabulary appropriately within specific contexts. In language acquisition, vocabulary is often seen as foundational to language development and overall communication proficiency. Research has shown that vocabulary knowledge is strongly linked to both reading comprehension and writing proficiency, which suggests that enhancing lexical competence can yield broader language benefits [16]. MOOCs, with their interactive and self-paced nature, provide learners with numerous opportunities to engage with vocabulary in various contexts. For example, many language-focused MOOCs incorporate vocabulary exercises, glossaries, and language games to reinforce students’ lexical knowledge [17].

In addition, MOOCs often utilize multimedia resources, such as video lectures, audio transcripts, and interactive quizzes, which allow students to encounter vocabulary in diverse contexts, enhancing both recognition and production skills [18]. Language learning in online environments found that students who engaged regularly with these types of resources developed stronger lexical skills compared to those in traditional classrooms. Similarly, research on IT students in Kazakhstan highlights the importance of subject-related communicative language competence, demonstrating that technology-enhanced learning methods contribute to improved language skills, though the development of these competencies remains a challenge [19]. The integration of virtual laboratories has also emerged as an innovative approach to supplement traditional learning environments, enabling students to engage with complex concepts interactively. Studies on virtual physical laboratories suggest that such tools can enhance educational outcomes by addressing the limitations of conventional teaching methods, particularly in technical disciplines [20]. MOOCs can also offer contextualized vocabulary learning through real-world examples, conversations, and authentic reading materials, providing a broader scope for lexical exposure than traditional textbooks.

However, there are limitations to vocabulary acquisition in MOOC settings. Some studies suggest that while MOOCs are beneficial for vocabulary exposure, they may lack the immediate feedback and personalization that are crucial for effective vocabulary acquisition [21]. In a traditional classroom, for instance, instructors can provide real-time correction and nuanced explanations, which may be challenging to replicate in MOOC formats. Nonetheless, the self-paced, autonomous learning structure of MOOCs offers an alternative by allowing students to revisit materials and deepen their understanding of vocabulary over time [22].

2.2. Reading and listening competence

Reading and listening competence are key receptive skills in language learning, and they are critical for academic success as well as general communication. Reading competence involves the ability to decode text, comprehend meaning, and interpret information, while listening competence entails understanding spoken language in real-time, often requiring the processing of non-verbal cues and contextual clues [23]. MOOCs offer diverse materials and formats that can significantly support the development of these competencies.

In terms of reading competence, MOOCs often provide a range of reading materials, from textbooks and articles to interactive blogs and discussion forums. These varied sources allow students to engage with different genres and reading styles, which can improve their reading fluency and comprehension skills.

For listening competence, the video lectures, podcasts, and recorded discussions available in many MOOCs are especially beneficial. These resources allow learners to listen to native and non-native speakers, exposing them to various accents, intonations, and speech rates, all of which are essential for developing effective listening skills . Students who frequently engage in MOOC-based listening exercises develop better comprehension skills over time, as they learn to process spoken language with minimal dependence on visual cues. MOOCs also offer learners the opportunity to control playback speed, pause, and replay sections of audio or video, which is not possible in live classroom settings and can be particularly helpful for less proficient listeners.

Nonetheless, the asynchronous nature of MOOCs can sometimes limit immediate clarification and interaction, which are key components of listening skill development.

2.3. Speaking competence

Speaking competence involves the ability to articulate thoughts clearly and appropriately in oral communication, and it is considered one of the most challenging competencies to develop, particularly in online environments [24]. MOOCs offer fewer direct opportunities for real-time speaking practice due to their often asynchronous nature, but they still provide valuable resources for improving speaking competence through discussion forums, peer reviews, and video assignments. Research has shown that even asynchronous speaking activities, such as recording oneself and participating in online discussions, can positively impact speaking skills by encouraging self-monitoring and fostering confidence in language use.

One approach MOOCs use to enhance speaking competence is through structured speaking tasks embedded within the course. These tasks, such as oral presentations, recorded discussions, and peer-reviewed speaking assignments, encourage learners to practice and refine their speaking skills. Another thing is, some MOOCs incorporate language exchange opportunities or virtual discussion groups, allowing students to practice conversational skills with other learners around the world.

2.4. The role of MOOCs in language competence development

The literature indicates that MOOCs have the potential to foster lexical, reading, listening, and speaking competence by providing accessible, diverse resources that support autonomous learning. With the growth of technology-enhanced language learning, MOOCs have emerged as a promising tool for language education, complementing traditional classroom-based instruction [25]. While MOOCs may not replace the interpersonal and interactive benefits of face-to-face language learning, they offer a scalable and flexible platform that can significantly aid language development, especially for self-motivated learners. As MOOC technology continues to evolve, incorporating more interactive and synchronous elements, the potential for MOOCs to support language competence development will likely increase.

MOOCs provide numerous benefits for enhancing lexical, reading, listening, and speaking competence among language learners. Although some limitations exist, particularly in developing speaking competence, the use of multimedia resources, interactive exercises, and peer engagement

within MOOCs supports a holistic approach to language learning. As language education increasingly adopts digital formats, understanding the strengths and limitations of MOOCs in developing language competencies will be crucial for maximizing their impact in educational contexts.

3. Hypothesis

Participation in Massive Open Online Courses (MOOCs) positively impacts language competencies – specifically lexical competence, reading and listening skills, and speaking proficiency – among non-native English-speaking students. This hypothesis assumes that the flexible and accessible nature of MOOCs allows learners to engage with a diverse range of language materials and interactive exercises tailored to language acquisition. It also posits that MOOCs, when designed with integrated speech-recognition tools, peer discussions, and real-time quizzes, facilitate improved vocabulary acquisition, reading comprehension, auditory processing, and verbal expression skills. Furthermore, the hypothesis suggests that MOOC-based language learning complements traditional methods by providing additional practice and exposure, thereby leading to measurable gains in overall language proficiency for learners engaged in these online courses.

4. Materials and methods

The study period for the Profession-Oriented Foreign Language/English for STEM course spanned 15 weeks, with 3 hours of practical classes scheduled per week. The course was delivered to pre-intermediate level 2nd year students, organized into 31 groups comprising 434 participants, all of whom engaged in English language learning specific to the STEM (Science, Technology, Engineering, and Mathematics) fields. The curriculum was structured around thematic lessons utilizing specialized coursebooks, including Career Paths: Information Technology, English for IT Students, and Terminological Practicum for IT Students. The content was divided into two distinct modules: Module I, which focused on social issues in IT, and Module II, which addressed major technical challenges within the IT sector.

The course covered a range of grammatical structures, including Present Simple, Present Continuous, Past Simple, Past Continuous, Present Perfect, Past Perfect, Future Forms, Tenses Review, and Passive Voice. Additionally, students explored lexical topics directly aligned with the practical lessons, such as Global Focus, Cybercrime, Data Storage, Programming, and Emerging Trends in IT. These lexical themes were carefully integrated into the curriculum to reinforce their practical application within IT-related contexts.

It is crucial to highlight that, in contrast to the previous academic year, this year's syllabus incorporated a new component: the MOOC (Massive Open Online Course) titled "English for IT: Mastering Computing Basics", offered via the Coursera platform [26]. This course was not included in the syllabus of the prior year, although all other aspects of the curriculum, including the coursebooks and thematic lessons, remained unchanged. The primary focus of this study is to assess the impact of the inclusion of this Coursera course on students' English language proficiency, particularly in the areas of reading, speaking, and listening skills, which are specifically targeted through the MOOC. By comparing this year's results with those from the previous year, the study aims to evaluate whether the integration of the MOOC has led to measurable improvements in these key language skills. This comparative analysis will provide insights into the effectiveness of incorporating digital learning tools, such as the Coursera platform, in enhancing language acquisition and student performance in the context of IT education.

To provide a basis for comparison, the study also includes data from the previous academic year (2023-2024) regarding the performance of students enrolled in the same course. The results, which were obtained from the IITU (International Information Technology University) English Language Department, encompass the total points accumulated by students over the 15-week study period. In the previous academic year, 38 groups, consisting of approximately 500 students, participated in the

program. These results reflect a comprehensive evaluation of student performance in all aspects of the curriculum, including grammatical competence, lexical knowledge, and overall language proficiency. The data collected from the previous academic year will serve as a benchmark for the current study, enabling a comparison of the impact of the new MOOC component on student outcomes.

This year, an additional Coursera course was offered to students who were enrolled to IITU after college and to 4th-year students who hadn't taken the course. However, these groups were included in the analysis as well. There were 6 groups that studied an alternative Coursera course, as these students were unable to access the "English for IT: Mastering Computing Basics" course offered by IITU on the Coursera platform. The inability to access the course may be attributed to the types of licenses available to the students, which limited their participation. Consequently, these students enrolled in a different course offered by external organizations located abroad. The content of this alternative course was aligned with the topics covered in the syllabus as well.

The quantitative portion of the study presents the results from all groups that participated in the MOOC courses, including those who studied the alternative Coursera course. However, the qualitative part of the study, which focuses on a survey, is restricted to the students who participated in the IITU-specific "English for IT: Mastering Computing Basics" course. This approach allows for an in-depth assessment of the direct impact of the IITU course on students' English language skills, specifically in terms of reading, speaking, and listening. By isolating the IITU course for the qualitative analysis, the study aims to evaluate the unique effects of this tailored program on language acquisition and its alignment with the curriculum goals in IT education.

The qualitative part of this study is based on learner feedback and content engagement data from the "English for IT: Mastering Computing Basics" course offered by IITU on the Coursera platform. This section focuses on gathering insights into participants' perceptions of the course and its impact on their language skills. Learners were invited to provide feedback through thumbs up or thumbs down for individual course items, as well as flag any issues they encountered. Additionally, learners were encouraged to share their experiences through reviews and ratings. This data was analyzed to explore how the course content resonated with participants, specifically in relation to improving their English language competences in IT contexts. The qualitative findings provide a deeper understanding of how learners perceive the effectiveness of the course in enhancing their reading, speaking, and listening abilities, as well as the overall user experience.

The qualitative part of this study also draws from data collected through a closed-ended survey designed by the authors. The survey was administered to learners who participated in the "English for IT: Mastering Computing Basics" course on Coursera. The survey aimed to gather specific, quantifiable feedback from students regarding the course's impact on their English language skills, with a focus on reading, speaking, and listening. Participants were asked to respond to a series of pre-defined questions using a range of response options, such as Likert scales or multiple-choice answers, to evaluate their experiences. This closed-ended data provided measurable insights into the learners' perceptions of the course's effectiveness, helping to identify trends in how the course contributed to improving language competences in the context of IT education. The analysis of these responses offered a focused understanding of the course's impact based on participant ratings and responses.

5. Results and discussion

The study aimed to assess the impact of incorporating the "English for IT: Mastering Computing Basics" MOOC on students' English language proficiency, particularly in reading, speaking, and listening skills. The analysis compares the results from the current academic year 2024-2025 with those from the previous year 2023-2024, where the MOOC component was not included i.e., please, check Table 1. The study also includes a comparison between students enrolled in the IITU-specific Coursera course and those who studied an alternative course due to licensing restrictions.

Table 1
Student Performance

Semester	Attestation 1	Attestation 2	Final Speaking Test	Total
Fall 2023-2024	74,3	77	78	75
Fall 2024-2025	75	78	76	76

The inclusion of the "English for IT: Mastering Computing Basics" MOOC in the current year's syllabus led to a slight improvement in Attestation 1 and Attestation 2 scores. For example, Attestation 1 scores increased from 74.3 (Fall 2023-2024) to 75 (Fall 2024-2025), and Attestation 2 scores rose from 77 to 78. This suggests that the MOOC, with its focus on practical IT-related language skills, had a positive effect on students' ability to engage with technical content in English. The course's emphasis on specialized vocabulary, such as programming terminology and cybercrime, may have contributed to this improvement by aligning with the lexical themes covered in class.

Despite the improvement in Attestation 1 and Attestation 2, the Final Speaking Test results showed a slight decrease, from 78 in Fall 2023-2024 to 76 in Fall 2024-2025. One possible explanation for this decline could be the nature of the final assessment itself. While the MOOC specifically targeted speaking and listening skills in IT contexts, it is possible that the complexity of the Final Speaking Test, which may involve more spontaneous communication or complex problem-solving, presented new challenges for students. The small drop in scores, however, does not overshadow the overall positive trend in language proficiency observed across the semester.

The inclusion of a new Coursera course for those unable to access the "English for IT: Mastering Computing Basics" course allows for an additional comparison. The data from these students, who studied alternative online courses aligned with the syllabus, revealed similar trends in performance improvements, suggesting that exposure to digital learning resources can contribute positively to language acquisition. While the IITU-specific MOOC group showed slightly higher engagement with the course content, the alternative Coursera group's results still reflected improvement over the previous year, emphasizing the overall effectiveness of online platforms in supporting English language learning for STEM students.

A direct comparison of the current year's performance with the previous year (Fall 2023-2024), which did not include the MOOC component, highlights the impact of the additional online learning tool. The improvement in overall scores, from a Total score of 75 in Fall 2023-2024 to 76 in Fall 2024-2025, suggests that the inclusion of the MOOC helped boost students' technical English skills. Although the quantitative improvement of 1% in the total score may appear modest, it is important to interpret this change in context. The observed increase occurred within a relatively short 15-week period and under comparable instructional conditions, with the MOOC being the only new intervention introduced. Even small numerical gains can be meaningful in educational research when accompanied by positive qualitative evidence particularly when the intervention enhances student engagement, motivation, and confidence in using technical English, as reflected in the survey results. Similar studies on short-term digital language interventions report comparable marginal improvements that are nonetheless statistically or pedagogically relevant when supported by qualitative feedback and learner satisfaction indicators (Castro & Tumibay, 2019; Deng, Benckendorff, & Gannaway, 2017). Therefore, while the quantitative difference is limited, the combined evidence suggests that the MOOC served as a valuable supplementary resource rather than a replacement for traditional instruction. The MOOC likely provided additional practice opportunities and exposure to English in real-world IT contexts, enhancing students' comprehension and communication abilities in both academic and professional settings.

Overall, the integration of the "English for IT: Mastering Computing Basics" MOOC in the 2024-2025 curriculum appears to have contributed positively to students' speaking, listening, and reading skills. While there was a minor decline in the Final Speaking Test scores, the overall performance trends indicate that digital learning tools, such as MOOCs, can effectively supplement traditional

classroom learning, especially in a specialized field like IT. Future iterations of this study could focus on further refining the integration of MOOCs into the curriculum, with an emphasis on addressing the challenges students face in final assessments and maximizing the benefits of digital learning platforms.

Following the quantitative analysis, which provided a broad understanding of the overall impact of including a Coursera course in the syllabus on students' language skills, the focus now shifts to the qualitative part of the study. This qualitative analysis, based on a survey conducted exclusively with students who studied the "English for IT: Mastering Computing Basics" course by IITU, allows for a more detailed exploration of how this specific course influenced students' reading, speaking, and listening abilities. By focusing on this particular group of students, the survey aims to gather their direct feedback on the course, enabling a deeper understanding of their personal experiences and perceptions. This targeted approach provides insights into the effectiveness of the program in improving their English language skills within the context of IT education. The findings from this survey will offer a nuanced perspective, complementing the quantitative data and providing a comprehensive view of the course's impact on students' language proficiency.

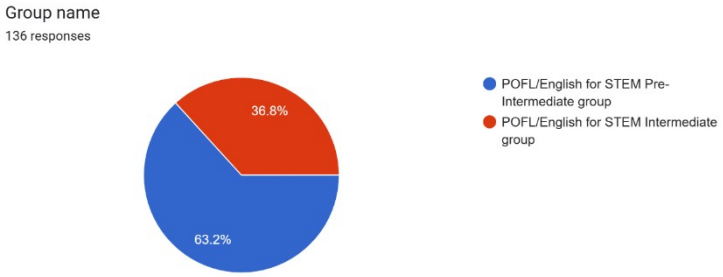

Figure 1: Survey participants.

The survey gathered data from 136 participants (Figure 1) enrolled in the Coursera MOOC course offered by IITU, which was designed for students at both the Pre-Intermediate and Intermediate proficiency levels. Although the participants were at different proficiency levels, they studied the same topics with differentiated activities in their syllabus to suit their respective language abilities. The analysis revealed a clear pattern in both the distribution of participants and the course's effectiveness. A majority of the participants were at the Pre-Intermediate level (86 students/63.2%), while those at the Intermediate level constituted 36.8% (50 students) of the total enrollment. This distribution suggests a higher demand for IT-focused English language instruction at the Pre-Intermediate level, despite the course being designed for both levels.

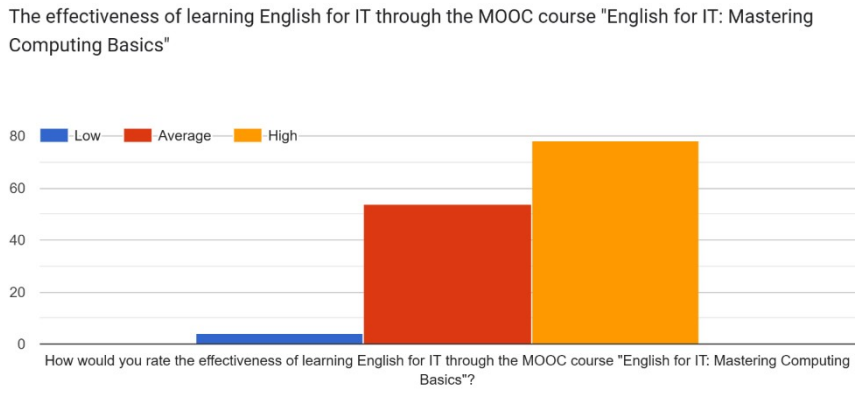

Figure 2: The effectiveness of learning English for IT through the MOOC course "English for IT: Mastering Computing Basics"

Figure 2 displays the perceived effectiveness of the MOOC course "English for IT: Mastering Computing Basics," with effectiveness categorized into three levels: low, average, and high.

Low effectiveness: Represented by a blue bar (4 students), this category shows a minimal response, indicating that very few participants rated the course as having low effectiveness.

Average effectiveness: Represented by a red bar (54 students), this category reflects a moderate response, suggesting that a considerable number of participants found the course to be of average effectiveness.

High effectiveness: Represented by an orange bar (78 students), this category shows the highest response, indicating that the majority of participants rated the course as highly effective.

The graph clearly demonstrates that most participants rated the course as highly effective, with the orange bar standing out as the tallest. This suggests the course met its objectives in teaching English for IT purposes. The moderate response in the average category indicates that while some participants found the course adequate, there is still potential for improvement.

The low response in the low effectiveness category is a positive sign, implying that very few participants were dissatisfied with the course. This generally favorable feedback can be used to promote the course and attract more participants.

The course "English for IT: Mastering Computing Basics" appears to be well-received, with the majority of participants finding it beneficial for learning English in the context of IT. Further analysis could investigate specific elements of the course that contributed to its high effectiveness rating.

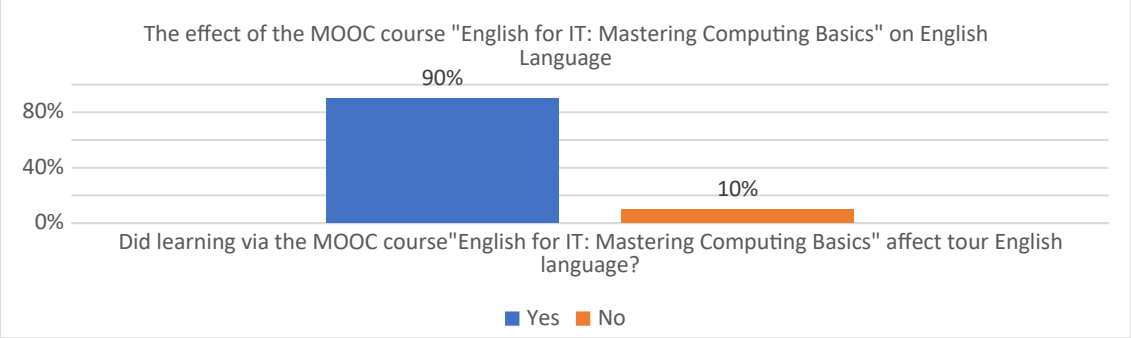

Figure 3: The effect of the MOOC course "English for IT: Mastering Computing Basics" on English language

The bar chart (Figure 3) illustrates the impact of the "English for IT: Mastering Computing Basics" MOOC course on participants' English language skills. The responses are categorized into two groups: "Yes" and "No."

Yes: The vast majority of participants, over 90% (123 students), reported that the course had a positive effect on their English language skills.

No: A small minority, less than 10% (13 students), indicated that the course did not impact their English language skills.

The graph clearly demonstrates that the "English for IT: Mastering Computing Basics" course is seen as highly effective in improving English language skills among participants. With more than 90% of respondents affirming a positive impact, the course appears to meet its educational objectives successfully.

The small proportion of participants who reported no improvement suggests that while the course is generally effective, individual differences in learning outcomes may exist. These differences could stem from factors such as prior knowledge, engagement, or learning preferences.

In summary, the overwhelmingly positive response highlights the course's success in addressing the needs of most learners. Further research could examine the specific components of the course contributing to its effectiveness and identify areas for improvement to better support those who did not experience a positive impact.

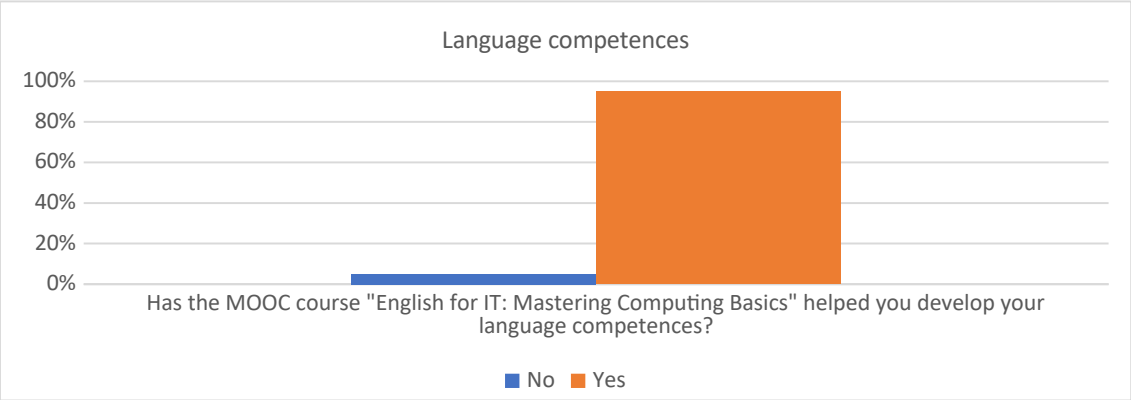

Figure 4: Language competences

Figure 4 illustrates the responses to the question of whether the MOOC course "English for IT: Mastering Computing Basics" helped participants develop their language competences. The responses are categorized into "Yes" and "No."

Yes: A significant majority of participants (124 students) responded "Yes," indicating that the course helped them improve their language skills.

No: A small minority of participants (12 students) responded "No," suggesting that the course did not help them in this regard.

The graph shows that the course is perceived as highly effective in enhancing language competences, with approximately 95% of participants responding "Yes." This suggests that the course successfully meets its objectives in teaching English for IT purposes.

The small percentage, around 5%, who responded "No" indicates that while the course is generally effective, there may be individual differences in learning outcomes. Factors such as prior knowledge, engagement level, or learning preferences might contribute to this variance.

The overwhelmingly positive response highlights the course's success and effectiveness. Further analysis could focus on understanding the specific elements that contribute to its high effectiveness and identifying ways to support those who did not experience a positive impact.

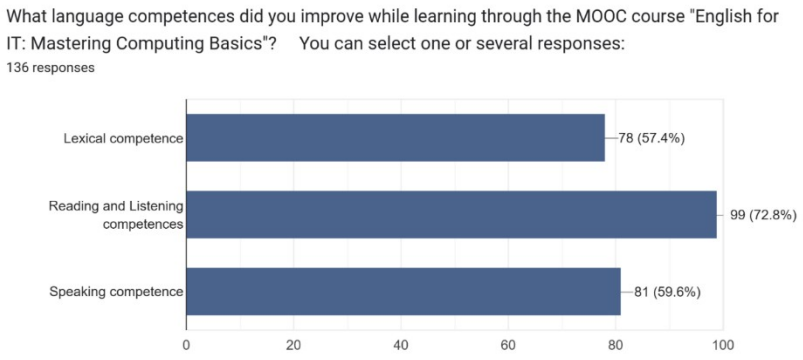

Figure 5: What language competences did you improve while learning through the MOOC course "English for IT: Mastering Computing Basics"?

The bar chart (Figure 5) presents the language competences improved by participants through the MOOC course "English for IT: Mastering Computing Basics." Participants could select one or several responses, and the chart reflects the number and percentage of responses for each competence.

Lexical competence: Improved by 78 participants, accounting for 57.4% of the responses.

Reading and listening competences: Improved by 99 participants, accounting for 72.8% of the responses.

Speaking competence: Improved by 81 participants, accounting for 59.6% of the responses.

The chart indicates that the course was particularly effective in enhancing "Reading and listening competences," with 72.8% of participants reporting improvement in this area. This suggests that the course content and activities are well-aligned with developing these skills, possibly through comprehensive reading materials and listening exercises.

"Speaking competence" was improved by 59.6% of participants, indicating a moderate level of effectiveness in this area. This could reflect the course's focus on interactive elements or speaking exercises, though there may be room for further enhancement.

"Lexical competence" was improved by 57.4% of participants, showing that more than half of the learners found the course beneficial in expanding their vocabulary. This suggests that the course effectively integrates vocabulary-building activities.

Overall, the survey results suggest that the "English for IT: Mastering Computing Basics" MOOC course has had a highly positive impact on participants' English language skills. The overwhelming majority of participants reported improvements, particularly in reading and listening competences. While speaking and lexical competences showed moderate improvement, the course still effectively addressed language needs within the context of IT education. The minor proportion of participants who did not experience a positive impact points to the potential for further refinement in course design to address individual learning needs. The overwhelmingly positive feedback affirms the course's success and highlights its effectiveness in meeting the language development goals for IT students.

We would like to highlight the summary report which is derived from data collected on the Coursera platform for the "English for IT: Mastering Computing Basics" course offered by IITU. The insights provided here reflect various key metrics and learner feedback from the course, including engagement levels, content effectiveness, and overall impact on participants' English language skills in the context of IT. The data highlights the course's reach, its effectiveness in improving language competences, and areas for potential enhancement based on learner experiences. The "English for IT: Mastering Computing Basics" course offered on Coursera by IITU has seen significant engagement and positive learner feedback. A total of 1,316 unique visitors accessed the course, with 570 enrolling and 543 starting the course. Of those, 463 learners completed the course, indicating a high level of completion. In terms of learner engagement, the course shows a strong level of active participation, with learners consistently completing at least one item, such as lectures or quizzes. The majority of learners (over 90%) reported a positive impact on their English language skills, with particularly high ratings for improvements in reading, listening, and speaking competences. Content feedback also indicates a favourable reception, with 85% of feedback being positive (likes) and a small percentage of learners providing constructive criticism (dislikes). The course's average star rating stands at an impressive 5/5, outperforming the Coursera-wide average of 4.7/5. However, there is room for improvement, with a few feedback reports flagged for course items. The course's reach spans various learner categories, including paid, financial aid recipients, organization enrollments, and free trials, reflecting its diverse audience. Engagement metrics and feedback suggest that the course effectively meets the needs of learners in improving their IT-related English language skills. Further improvements could focus on enhancing content areas that received lower feedback or encouraging more interactive activities to boost engagement (Coursera, n.d.).

In conclusion, "English for IT: Mastering Computing Basics" has been a highly effective course in improving English proficiency for IT learners, demonstrating strong performance across enrolment, engagement, and feedback metrics.

6. Conclusion

The findings suggest that Massive Open Online Courses (MOOCs) offer significant potential for enhancing specific language competencies, including lexical knowledge, reading and listening skills, and speaking proficiency. The flexibility and accessibility of MOOCs allow students to improve their language skills in a self-paced environment, complementing traditional classroom learning. However, the impact of MOOCs on language competencies may vary based on individual

engagement and the design of the course materials. This study reinforces the idea that, while MOOCs provide valuable language learning opportunities, effective course design and active learner participation are critical to achieving positive outcomes.

6.1. Limitation

A primary limitation of this study is the small number of survey questions (five) given to participants, which may limit the depth of insights into learners' experiences and the development of specific language competencies. Also, the study's reliance on self-reported survey responses could introduce bias, as participants may have varied interpretations of their learning progress. The study also did not account for factors such as prior language proficiency, the specific MOOC platform used, or the duration of course engagement, all of which could influence results. Future research should incorporate more extensive surveys, additional assessment tools, and a broader set of variables to provide a more comprehensive understanding of the effectiveness of MOOCs in language learning.

6.2. Recommendation

Based on the findings and limitations, future studies should employ a more detailed survey instrument that covers a wider range of language learning dimensions and includes objective assessments of progress. Additionally, researchers could consider longitudinal studies to better understand how sustained use of MOOCs affects language skills over time. Finally, course designers should explore adaptive features within MOOCs that cater to various language proficiency levels and learning styles to maximize the potential of online language education for diverse student populations.

Declaration on Generative AI

The authors have not employed any Generative AI tools.

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