

The Role of Technology in Promoting Collaborative Learning: Case Studies from Multicultural Classrooms

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Abstract. The objective of this research is to examine the potential of technology in facilitating collaborative learning in a multicultural classroom setting at SMP 11 Jakarta. Given the culturally diverse student backgrounds, this research is concerned with the ways in which technology can facilitate enhanced interaction and collaboration among students from different cultural backgrounds. This research employs a qualitative approach utilising a case study methodology to gain comprehensive insights into the experiences and perceptions of students and teachers regarding the utilisation of technology in collaborative learning. The data were gathered via in-depth interviews, classroom observations, and the examination of pertinent documents. The findings demonstrate that technology not only facilitates communication between students but also fosters a more inclusive and collaborative learning environment. However, there are certain challenges associated with the implementation of technology, particularly with regard to students' digital literacy and the disparity in technology infrastructure across different settings.

Keywords: *Technology, Collaborative Learning, Multicultural*

I. INTRODUCTION

Technological developments in education over the past few decades have resulted in profound changes in the way students learn and interact in the classroom. The advent of educational technology, which encompasses hardware, software, online applications and other interactive tools, has transformed the learning environment, offering innovative new ways to deliver knowledge, communicate and collaborate. From e-learning to the utilisation of cloud-based collaborative technologies, the application of technology enables learning that is more flexible, inclusive and adaptive to student needs.

In the absence of modern technology, education was often based on face-to-face interactions in physical classrooms, with a structured, teacher-centred approach to teaching. The resources available for learning were restricted to textbooks and other printed materials, while interactions between students were limited by the constraints of the classroom environment and the time available. However, with the advancement of technology, this paradigm has changed. In the present era, students have access to digital learning resources at any time and in any location, interact with classmates from around the world, and collaborate on virtual projects through technology-based tools such as online learning platforms, communication apps, and collaborative presentation tools (Bastian, 2024).

A significant consequence of technological advancement is the expansion of access to a broader array of educational resources. The advent of the internet has enabled students and teachers to access a broader range of learning materials, including scientific articles and educational videos, that were previously inaccessible. Online learning platforms, such as Google Classroom, Moodle, and Edmodo, provide teachers with the ability to organise and deliver materials digitally, facilitate online discussions, and assign and grade assignments in real-time. Such technologies facilitate personalised learning, enabling students to learn at their own pace and explore materials that align with their interests and needs.

In multicultural educational establishments such as SMP 11 Jakarta, the utilisation of technology has the potential to facilitate the creation of an inclusive and collaborative learning environment. Schools with culturally and ethnically diverse student populations frequently encounter difficulties in uniting students from disparate social, cultural, and linguistic backgrounds. Students from varying cultural backgrounds may exhibit disparate learning styles, perceptions, and values regarding education, which can impede communication and collaboration within the classroom. In such instances, the role of technology becomes pivotal, serving as a conduit that bridges these differences (Aruna et al., 2024).

The utilisation of technology can facilitate the overcoming of communication barriers through the deployment of translation tools or language-based applications. The utilisation of platforms such as Google Translate can facilitate effective communication between students who have different mother tongues. Furthermore, video conferencing applications such as Zoom

or Microsoft Teams, which are equipped with interactive features such as chat, digital whiteboards, and breakout rooms, allow students to collaborate on group tasks despite being in different locations or having cultural differences. The use of this medium allows for a more dynamic and democratic interaction in the classroom, where all students, regardless of their background, have equal opportunities to contribute.

In the context of collaborative learning, technology also plays a role in the design of more inclusive team-based projects. To illustrate, the utilisation of cloud-based collaborative platforms, such as Google Docs or Padlet, enables students to engage in simultaneous collaboration on a shared project or task, irrespective of their physical proximity. Students can make their contributions, provide feedback on their peers' work, and complete projects collectively, concurrently. This not only fosters collaboration but also cultivates students' capacity to work in cross-cultural teams, thereby enhancing their intercultural communication abilities (Novrizal & Manaf, 2024).

The utilisation of technology not only serves to facilitate communication between students, but also to enhance the quality of collaborative interactions. In a multicultural classroom, technology can facilitate diverse learning styles, enabling students to collaborate in ways that are more flexible and tailored to their individual preferences and strengths. To illustrate, in a group of students from disparate cultural backgrounds, technology enables the division of tasks according to individual skills or learning styles, thus allowing each student to contribute in a manner that aligns with their strengths. Furthermore, technology-based platforms can facilitate the creation of a more inclusive learning environment, wherein students who may experience reticence in interacting in person can participate through online discussions or other digital platforms.

Furthermore, technology provides access to a more diverse range of learning materials, which can assist students in understanding different perspectives. In a multicultural environment, it is crucial for students to learn about and appreciate various cultural perspectives. With the use of technology, educators can introduce learning resources from different cultures through relevant videos, articles, or other digital content. This not only enhances students' comprehension of the subject matter being studied but also fosters an understanding and appreciation of the cultural diversity present in the classroom (Mariyono, 2024).

While the potential of technology in fostering collaborative learning is considerable, there are a number of challenges to be faced in its implementation, particularly in schools like SMP 11 Jakarta. One of the main challenges is students' digital literacy, especially among students who are less familiar with the use of technology in the learning process. Students with limited access to technology devices or adequate internet connection may have difficulty in actively participating in technology-based learning activities.

Furthermore, deficiencies in technology infrastructure within educational institutions can also impede the effective integration of technology in learning. Inequities in student participation may arise when not all schools possess the requisite devices and internet connectivity to support optimal technology utilisation. This can result in disparities in access to technology, whereby some students may have superior access to technology than others. This challenge necessitates a comprehensive investment in educational infrastructure, coupled with teacher and student training to enhance digital literacy.

This research project aims to analyse the potential of technology in multicultural classrooms to foster collaborative learning and enhance the effectiveness of the teaching-learning process. Adopting a qualitative approach, it will explore the experiences and perceptions of students and teachers at SMP 11 Jakarta regarding the use of technology in collaborative learning (Permana et al., 2022).

II. METHODS

This research uses a qualitative approach with a case study method, which was chosen because it provides depth in understanding the context, experiences and perspectives of individuals in more detail. A case study was used to explore in depth a particular situation involving technology-based collaborative learning at SMP 11 Jakarta, with a particular focus on multicultural interactions between students. This method is ideal for obtaining a comprehensive picture of how technology affects collaborative dynamics in a culturally heterogeneous classroom.

Research Subjects

The research subjects consisted of teachers and students at SMP 11 Jakarta who were involved in a multicultural classroom. The multicultural class at this school is attended by students with diverse ethnic, cultural and linguistic backgrounds, thus creating a unique learning environment.

Data Collection Technique

Data in this study were collected through **in-depth interviews**, **classroom observations**, and **documentation**. These diverse data collection techniques aim to produce a rich and detailed picture of the interactions and dynamics that occur in a multicultural classroom.

1. In-depth Interviews

Interviews were conducted with **10 students** and **3 teachers** to gain first-hand insights into their experiences of using technology for collaborative learning. The interviews were semi-structured, which allowed the researcher to extract in-depth information while providing space for respondents to express their views and experiences freely. The interviews were recorded and then transcribed for further analysis.

- The student interviews focused on their experiences of collaborating with other students from different cultural backgrounds using technology. The questions included their perceptions on the ease of use of technology, how technology facilitates communication and cooperation, and the challenges they face in technology-based learning.
- Teacher interviews aim to explore their views on the effectiveness of technology in promoting collaboration in multicultural classrooms, the methods they use to integrate technology into learning, and how they overcome technical and pedagogical barriers that arise.

2. Classroom Observation

Observations were conducted in 5 classes that used technology in the collaborative learning process. The observations aimed to directly observe students' interactions as they used technology in collaborative tasks, such as group discussions, joint projects, or presentations.

The main focus of the observation is to see how technology facilitates interaction between students, how teachers manage the class and use technology as a learning tool, and the collaborative dynamics that emerge in heterogeneous groups of students. Observations were conducted in a participatory manner, where the researcher was in the classroom without interrupting the teaching-learning process, recording students' verbal and non-verbal interactions, and observing the use of technology platforms such as Google Classroom, Zoom, and other collaborative applications.

3. Documentation

Documentation data includes analyses of learning materials delivered through technology, such as assignments, worksheets or presentations created by students using digital applications. In addition, the platforms used in collaborative learning, such as Google Classroom, Zoom, or other web-based applications, are also reviewed to see how these technologies are integrated into learning.

This documentation provides a richer context of how technology is used practically in collaborative activities and how students and teachers utilise technological features to support the teaching-learning process.

Data Analysis

Data obtained through interviews, observations and documentation were analysed using thematic analysis. Thematic analysis is a method used to identify, analyse and report themes or patterns in qualitative data. This analysis process involved several stages:

1. Transcription

All interviews were recorded and then transcribed verbatim. These transcripts formed the basis for the subsequent data coding process. Classroom observations were also documented in detail in the form of field notes.

2. Coding

After the data was transcribed, the first step in thematic analysis was coding. Coding is the process of labelling segments of data that are relevant to the research topic. In this study, some of the initial codes identified included 'intercultural collaboration', 'use of technology', 'technical challenges', and 'teacher role'. These codes were then grouped based on themes that emerged from the interviews, observations and documents.

3. Categorisation

Once all the data was coded, the codes were grouped into larger **categories**. For example, the code 'intercultural collaboration' might be included in the category 'impact of technology on social interaction', while the code 'technical challenges' might be included in the category 'barriers to technology implementation'. This categorisation helps in collating key themes relevant to the research questions.

4. Inference

Based on the themes that emerged from the coding and categorisation process, the researcher then drew conclusions on how technology plays a role in promoting collaborative learning in multicultural classrooms, the challenges faced in the implementation of technology, and the perceptions of students and teachers regarding the use of technology.

Validity and Reliability

To ensure data validity, the researcher used **data triangulation**, comparing and confirming findings from interviews, observations and documentation. This triangulation helped to reduce bias and ensure that the findings truly reflected the reality in the field. In addition, the researcher also used **member checking**, where the results of the initial analysis were confirmed back to the research subjects (teachers and students) to ensure that the interpretation of the data was in line with their experiences.

Research Ethics

This research was conducted with ethical aspects in mind, including maintaining the confidentiality of participants' identities, seeking written consent before conducting interviews or observations, and ensuring that participation in the research was voluntary.



Figure 1. Qualitative Research Design

III. RESULTS AND DISCUSSION

The Role of Technology in Enhancing Collaboration

The role of technology in enhancing collaboration in education, especially in multicultural schools such as SMP 11 Jakarta, cannot be ignored. Along with the rapid development of technology, the traditional approach to learning, where student interaction is limited to physical encounters in the classroom, has evolved to become more dynamic and flexible. Technology now offers platforms and tools that enable cross-cultural collaboration, which is especially important in the context of a multicultural classroom where there are diverse backgrounds, languages and cultures.

In a multicultural environment, one of the biggest challenges in collaboration is the difference in culture, customs, and language. At SMP 11 Jakarta, students come from various backgrounds, which often affects the way they interact and collaborate. Technology acts as a bridge that connects these students, creating a space where they can interact and work together without being hindered by physical or cultural differences.

Online learning platforms such as Google Classroom, Microsoft Teams and Zoom are becoming highly effective tools in facilitating virtual collaboration. With these platforms, students can meet virtually, discuss and complete assignments together without having to meet in person. This is especially beneficial when physical meetings are difficult, for example due to distance or time differences. In the context of a multicultural classroom, where students may have different preferences or time constraints due to cultural factors or family habits, this technology offers the flexibility needed to still be able to collaborate (Maesaroh & Marlana, 2021).

In addition, technology enables a more democratic and inclusive learning experience. These platforms provide opportunities for all students to contribute, even those who may lack the confidence to interact in person in the classroom. Through features such as chat or discussion forums, students can express their opinions and ideas without the pressure of public speaking, which may be a challenge for some students who lack language fluency or have verbal communication limitations.

One of the key elements in technology that supports collaboration is collaborative applications. Apps like Google Docs, Padlet and Trello have become essential tools in project-based and collaborative learning. In a multicultural classroom, these apps allow students to work together in real-time on group projects or assignments, regardless of their physical location. For example, Google Docs allows multiple students to edit the same document simultaneously, make comments and provide feedback in real time. This creates a more efficient and interactive work process compared to traditional approaches (Inayah M. Saleh R, 2024).

Furthermore, these collaborative applications help divide responsibilities in a more structured manner. In a multicultural context, differences in learning styles and cultures can affect the way students collaborate. Some students may be more proactive in taking the initiative, while others are more waiting for direction. With the help of technology, responsibilities in tasks can be divided more fairly, ensuring that each student contributes according to their capacity. This not only strengthens teamwork, but also develops time management and communication skills among students of different backgrounds.

Technology also enables adaptive learning platforms, which tailor the learning process to students' individual needs and abilities. This is particularly relevant in the context of the multicultural classroom at SMP 11 Jakarta, where students may have diverse levels of academic ability and technological literacy. With technology, teachers can design tasks that match each student's ability level, allowing them to work at their own pace and collaborate more effectively (Syamsi & Noormiyanto, 2024).

For example, a student who is less familiar with technology or who has difficulty with a particular language can be given simpler tasks or use more intuitive applications. On the other hand, students who are more adept at using technology can be given

the role of group leader or mentor for their classmates who need help. Thus, technology not only enhances collaboration but also supports more inclusive learning, where every student, regardless of their background, can participate equally.

In multicultural classrooms, language differences are often a huge barrier to collaboration. Technology comes as a capable solution to this problem by providing various tools to help students communicate more fluently. For example, automatic translation tools such as Google Translate allow students who are not fluent in Indonesian or English to understand the subject matter and communicate with their peers. This provides equal opportunities for students from different cultural backgrounds to collaborate without worrying about being hampered by language differences.

In addition to translation tools, there are also digital dictionaries and AI-based applications that can help students learn a new language or enrich their vocabulary. At SMP 11 Jakarta, where students are ethnically and culturally diverse, the use of such technology helps to create a more inclusive and supportive learning environment where all students can engage in learning and collaboration without being limited by language barriers (Wulayalin & Suprihatiningrum, 2024).

Technology provides opportunities for students to participate more actively and equally in collaborative processes. In traditional learning, students who are more dominant in terms of personality or language ability often dominate group discussions and tasks, while students who are more introverted or who have language barriers tend not to participate fully. With technology, participation can be more evenly distributed as digital platforms such as online discussion forums, virtual brainstorming tools and cloud-based projects allow each student to contribute in ways that suit their preferences.

For example, in a group assignment using Google Docs, every student has the opportunity to write, edit, or provide feedback without having to wait for their turn to speak in front of the class. This ensures that every student, whether vocal or quieter, has a space to contribute. This equality in collaboration is especially important in multicultural classrooms, where cultural and language differences often affect group dynamics. Technology helps ensure that all students have equal access to the learning and collaboration process (Nongko et al., 2024).

The implementation of technology in the classroom presents a number of challenges.

While technology offers a variety of opportunities to enhance collaboration between students, its implementation is faced with a number of significant challenges. These challenges have their roots in a number of different areas, including students' digital literacy, the limited technological infrastructure in schools, and the efficient management of virtual classes.

One of the primary challenges in the implementation of technology in collaborative learning is the relatively low level of digital literacy among students. Digital literacy can be defined as the ability to utilise technological devices, comprehend online platforms and communicate effectively through digital media. However, it is evident that not all students at SMP 11 Jakarta possess these skills. This is particularly the case for those who originate from economically disadvantaged backgrounds, where access to technological devices at home is either limited or non-existent.

The lack of digital literacy creates a disparity among students, both in their capacity to comprehend technology and in their ability to utilise it for educational purposes. Students who are accustomed to using technology devices at home tend to adapt more readily to online learning platforms, whereas students who lack similar access may require a longer period of time to grasp the functionality of these devices and platforms. This can impede the collaborative learning process, as less technologically proficient students may necessitate additional assistance from educators or their peers (Tambunan et al., 2024).

Furthermore, digital literacy encompasses not only a fundamental comprehension of technological devices but also the capacity to engage in critical discourse when communicating through digital media. In the context of collaboration, students must possess the ability to convey their ideas in a clear and effective manner through technological platforms, whether through text, video, or other forms of digital communication. The inability to communicate effectively can impede collaboration and negatively impact student engagement in group learning activities.

Another significant obstacle to the integration of technology in support of collaborative learning is the inadequate technological infrastructure. Despite the school's location in an urban setting, the technology infrastructure within SMP 11 Jakarta does not adequately facilitate the optimal utilisation of technology in learning activities.

One of the most common issues encountered is the slow or unstable internet connection. Limited internet access can impede the efficiency of the online learning process, particularly when students are required to work together in real-time using platforms such as Google Classroom or Zoom. Frequent internet connection interruptions make it challenging for students and teachers to maintain consistent engagement with the learning material, which can subsequently reduce students' motivation to actively participate in collaborative activities.

Furthermore, the dearth of sufficient technological devices in educational institutions represents an additional obstacle to the implementation of technology. Ideally, every student should have access to devices such as laptops or tablets to support technology-based learning activities. However, in reality, not all schools have sufficient devices for all students to use, necessitating a system of shared access or reliance on personal devices. This reliance on personal devices creates a disparity between students who have access to advanced devices and those who do not, which can subsequently affect their level of participation in collaborative learning.

Students who lack personal devices at home must often wait their turn to use the devices provided by the school, which impedes the learning process, reduces opportunities for students to engage in collaboration, and exacerbates inequalities in learning. This gap is particularly pronounced in multicultural environments, where students from different economic backgrounds have unequal access to technological resources.

Another challenge is the complex management of the virtual classroom. In a traditional classroom setting, the teacher has full control over in-class interactions and can monitor student dynamics directly. However, in technology-based collaborative learning, especially online, teachers must manage student engagement remotely, which presents a unique set of challenges.

It is incumbent upon teachers to create an interactive classroom atmosphere in which every student has the opportunity to actively participate. This is no simple task, particularly when students are working together in virtual teams. There is a risk that students may lose focus or motivation as a result of feeling physically isolated from their classmates. In such situations, teachers must be able to motivate students to remain engaged, either through the use of interactive activities, engaging technological features, or by providing clear guidance on collaborative tasks.

Another challenge in managing a virtual classroom is maintaining the established class structure. Unstructured online learning can result in student confusion and difficulty following instructions. It is therefore the responsibility of the teacher to organise a clear schedule and provide sufficient time for students to ask questions or request technical assistance. Furthermore, it is essential that all students have access to the same materials and are aware of how to use the technology needed to complete their assignments (Yasa et al., 2024).

Furthermore, in a multicultural setting, educators must be mindful of cultural nuances and student requirements. It is imperative that technology is leveraged to foster inclusion, ensuring that every student, regardless of cultural background or technological proficiency, has an equal opportunity to engage and collaborate. This necessitates meticulous oversight from educators to prevent any student from feeling marginalised or overlooked in the learning process.

Teachers and students frequently encounter technical challenges when utilising technology for learning purposes. Technical issues, such as malfunctioning devices, incompatible software, or problematic learning platforms, can impede the seamless progression of learning. Regrettably, not all educational institutions possess the requisite resources to provide comprehensive technical assistance. Consequently, when such issues arise, teachers and students may be compelled to devise their own solutions or await assistance from the school, a process that is often time-consuming and can diminish the efficacy of the learning experience.

Furthermore, training on the use of technology represents a significant challenge. Many teachers may lack the requisite training to effectively manage collaborative classes with the aid of technology. Meanwhile, students with limited digital literacy also require additional guidance to understand how to utilise available devices and platforms.

Student and Teacher Perceptions

The majority of students involved in this study indicated that technology plays a pivotal role in facilitating interaction with classmates from diverse cultural backgrounds. In a multicultural classroom context such as SMP 11 Jakarta, technology serves as a bridge that connects students from different cultural, religious and linguistic backgrounds. It not only breaks down barriers that may arise due to social and cultural differences, but also creates a space where students can collaborate more effectively. In collaborative learning, technology becomes a medium that allows students to work together more seamlessly, regardless of cultural differences and physical distance.

In the contemporary digital age, online platforms such as Google Classroom, Zoom, and WhatsApp are frequently utilized by students to communicate outside of school hours. The use of technology provides an informal space where students can engage in the sharing of ideas, the posing of questions about the subject matter under discussion, or even just the holding of conversations with the objective of gaining a deeper understanding of the perspectives held by their peers. In a multicultural classroom, the capacity to communicate beyond the formal parameters of the classroom is vital, as it can facilitate cross-cultural interactions. With technology, students have enhanced opportunities to interact with peers from diverse backgrounds, whether through online discussions, group projects or informal conversations on social media. This not only broadens students' understanding of other cultures, but also fosters stronger cross-cultural friendships (Nuryadi & Widiatmaka, 2023).

Moreover, technology facilitates a more inclusive learning environment. Students who may experience discomfort or a lack of confidence in face-to-face interactions due to cultural differences can employ technology as a means of facilitating greater engagement in group discussions. For instance, through the use of chat rooms or online discussion forums, students are able to express their ideas in a more comfortable manner. Furthermore, technology provides opportunities for students to enhance their communication and collaboration skills in a more flexible environment. They are able to work together in groups, share information, and learn together despite being physically located in different places. This kind of interaction, which is not limited by time and space, contributes greatly to the creation of a more harmonious dynamic in a multicultural classroom.

From the perspective of educators, technology has become a valuable tool that enhances their pedagogical approaches. The incorporation of technology in the learning process has been perceived by educators at SMP 11 Jakarta as a means of diversifying and enhancing the quality of learning activities. In the context of collaborative learning, technology has been identified as a valuable tool for educators, enabling them to design dynamic and student-centred learning activities with greater flexibility. The utilisation of various digital platforms and apps has been observed to facilitate the sharing of lesson materials in a more efficient and convenient manner. This includes the uploading of videos, presentations, and learning modules, which can be accessed by students at their own pace and in a location that is convenient for them. This approach has the potential to reach all students, including those who may require additional time to grasp the material presented in class.

Furthermore, the utilisation of technology enables educators to provide immediate feedback to students. Furthermore, teachers can monitor students' progress in collaborative tasks that are assigned digitally, and provide necessary corrections or

directions immediately. This not only improves teaching efficiency, but also makes learning more personalised and responsive to students' individual needs. Additionally, teachers can group students into small groups on the digital platform, which allows for more structured and purposeful collaboration. Each student can contribute according to their ability, and teachers can easily monitor the progress of each group without having to interrupt the collaboration (Zamista & Azmi, 2023).

However, while technology offers numerous benefits, educators also recognise that there are several challenges associated with its implementation. One of the primary challenges is the prevalence of technical issues. Not all students have equal access to technology devices or an adequate internet connection, which can impede the effectiveness of technology-based online or collaborative learning. Some students may lack devices that are compatible with the learning application used by the teacher, or they may experience internet connection disruptions that hinder their participation in learning.

In the event of technical difficulties, teachers are frequently required to provide alternative teaching methods for students. For instance, in the event that students are unable to access online materials, teachers may be required to provide printed materials or conduct supplementary face-to-face sessions. This undoubtedly increases the workload for teachers, who must continue to identify methods to guarantee that all students have equal access to learning. Furthermore, teachers themselves must continually enhance their digital competencies. While a growing number of teachers are integrating technology into their pedagogical practices, not all teachers are confident or well-versed in the utilisation of diverse digital applications and platforms. Consequently, the training and development of digital competencies for teachers is a crucial element to ensure the optimal utilisation of technology in learning (Zikri, 2024).

It is evident that both students and teachers at SMP 11 Jakarta perceive the utilisation of technology to be advantageous in enhancing interaction and collaboration within a multicultural classroom setting. For students, technology provides the opportunity to form cross-cultural friendships and enhance their learning experience. For teachers, technology is a tool that expands teaching methods and facilitates the monitoring of the learning process. However, technical challenges and the necessity for enhanced digital literacy remain obstacles that must be overcome to ensure the effective and inclusive utilisation of technology in multicultural classrooms.

IV. CONCLUSIONS

The present research emphasises the significant function of technology in facilitating collaborative learning, particularly in a multicultural classroom setting at SMP 11 Jakarta. A multicultural classroom, comprising students with disparate cultural backgrounds, languages and value systems, presents a unique set of challenges with regard to interaction and collaboration. The utilisation of technology serves to address these challenges, thereby facilitating enhanced communication and collaboration among students. At SMP 11 Jakarta, technology plays a pivotal role in fostering collaboration between students from diverse backgrounds. The utilisation of assorted technological platforms, including online learning applications (Google Classroom, Zoom), collaborative tools (Padlet, Jamboard), and digital discussion forums, enables students to engage in collective endeavours on group projects or assignments, irrespective of geographical, cultural, or linguistic dissimilarities. The utilisation of technology enables the sharing of ideas, the undertaking of tasks in a simultaneous manner and the facilitation of more efficacious communication. One of the most significant challenges in a multicultural classroom is the creation of an environment in which students can comprehend one another and collaborate effectively despite substantial cultural discrepancies. In this context, technology serves as a conduit, enabling students to interact in a more flexible manner, transcending the constraints of time and geography. The utilisation of technology, such as chat rooms, discussion forums and online meetings, enables students to exchange ideas and collaborate with greater autonomy. Although technology has been demonstrated to facilitate collaboration and interaction in multicultural classrooms, this research has also identified several significant challenges that require attention. The initial challenge pertains to the digital literacy of the students. It is evident that not all students possess the requisite digital literacy skills to utilise technology effectively for learning purposes. Some students may still encounter difficulties in comprehending the functionality of collaborative learning software or applications. It is therefore imperative that schools provide digital literacy training, equipping students with the requisite skills to utilise technology effectively within the learning environment. The findings of this study have significant implications for the future of multicultural education in Indonesia, particularly at SMP 11 Jakarta. Technology serves not only as a tool to support learning, but also as a crucial driver in the creation of a more inclusive and collaborative learning community. When implemented effectively, technology can help overcome cultural, linguistic and geographical barriers that often impede multicultural education.

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