# Assessing the Impact of Multicultural Curriculum on Student Performance in Beijing High Schools

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**Abstract**

Considering increasing diversity and the need for culturally responsive education, this study examines the integration of technology within multicultural curricula in Chinese high schools. This study focuses on the interplay between task characteristics and technological capabilities and their impact on student performance. Grounded in the Task-Technology Fit theory, the analysis employs structural equation modelling (SEM) to assess the relationships among these variables. This study aims to identify how aligning educational tasks with technological resources can enhance student outcomes in multicultural learning environments.

The research design involved collecting data from a purposive sample of teachers and students in Beijing, and the analysis revealed significant relationships among task characteristics (TaC), technology characteristics (TeC), task-technology fit (TTF), and student performance (SP). The findings highlight that optimal alignment between educational tasks and technological tools is crucial for enhancing academic performance and fostering deeper engagement with the multicultural aspects of the curriculum.

These results emphasise the critical need for strategic selection and integration of technology in educational settings. This study underscores the importance of developing strategies that consider both the pedagogical aspects of the curriculum and the technological tools used for its delivery. This research provides empirical insights into the effective use of technology in multicultural education and offers valuable guidance for educators and policymakers. Furthermore, it plays a role in attaining sustainable development goal 4 and 10. The findings contribute to the ongoing discourse on educational technology and multicultural education, with practical implications for enhancing teaching and learning in diverse educational contexts.

**Keywords:** multicultural education, task-technology fit, technology integration, sustainable development goals

## 1. Introduction

With the increasing complexity of society, it is imperative that education systems adjust accordingly. Pressures on these systems are currently at an unprecedented level due to rapid advancements in the education system, which have rendered traditional learning methods inadequate (Coetzee et al., 2021). To address these expectations, a change in teaching methods is necessary, and a multicultural curriculum can fulfil this need. The acquisition of knowledge is a cumulative process that requires a profound comprehension of the subject matter for pupils to excel (Sleeter & Carmona, 2017). It is important to provide diverse opinions that can be highlighted and included in teaching methodologies and curricular content. This advancement aims to emphasise the significance of students' cultural varieties while propelling them towards equal possibilities. Conventional teaching methods were not designed to accommodate all cultures, but this is not the case with foreign language education, as culture and language are closely intertwined (Dimici & Başbay, 2021).

Incorporating local identities and cultural narratives into the curriculum emphasises the importance of diversity as a core educational value (Islam, 2021). Success in our interconnected world is assured when children acquire not only cognitive skills but also emotional intelligence (Cuccurullo & Cinganotto, 2020; Gay, 2018). Beijing provides a unique setting for studying multicultural education methods, as it combines a rich historical foundation with modern

educational innovations. This allows for a comprehensive examination of the implementation and outcomes of such strategies.

Among this pedagogical evolution, the role of technology in multicultural classrooms has emerged as a dominant force in redefining educational landscapes (Tualaulelei & Halse, 2021). The integration of digital tools and platforms in education transcends traditional boundaries, offering novel pathways for inclusive and culturally aware learning experiences. It champions a form of cultural awareness that ensures equitable access to educational resources, thereby facilitating a more engaged and diverse student body (Chisholm, 1998; Okojie-Boulder et al., 2008). This study is poised at the nexus of technological integration and multicultural curricular frameworks within the high schools of Beijing, aiming to illuminate how such integration not only enhances but also fundamentally transforms students' multicultural competencies. It endeavours to explore the innovative incorporation of digital technologies into the curriculum, leveraging multimedia tools to foster immersive cultural experiences and collaborative projects that catalyse cultural exchange (Ergenc, 2022; Yang, 2022).

This study is guided by task-technology fit theory, which provides a lens through which to scrutinise the efficacy of technological interventions in education (Liu et al., 2020). This theoretical framework posits that the success of these interventions is intricately linked to the degree of alignment between the pedagogical tasks at hand and the technological tools deployed. In the milieu of multicultural education, technology is reimagined not as a mere conduit for information but as a pivotal facilitator of engagement with a diverse array of cultural narratives. This strategic integration of technology is anticipated to engender immersive learning experiences, enhance interactive participation, and afford access to a vast repository of resources, thereby enriching students' understanding and appreciation of cultural diversity.

Through a meticulous exploration of the nuanced application of technology within the multicultural educational settings of Beijing's high schools, this study aims to contribute valuable insights to the ongoing dialogue on educational technology and multicultural education. It seeks to offer empirically based strategies for educators and policymakers to leverage technological innovations to foster rich, engaging, and inclusive multicultural learning environments. In doing so, it aspires to influence future educational practises and policies, enriching the pedagogical landscape with a more nuanced understanding of the synergies between technology and multicultural education.

## 2. Literature Review

The literature review for this study starts with an examination of multicultural education, encompassing its evolution and implementation through the lens of task-technology fit theory. This is followed by a comprehensive literature review that integrates essential variables from theory while considering the specific attributes of this study. The objective of this study is to establish a theoretical framework and a research model that will facilitate the formulation of research hypotheses.

### *2.1 Task-Technology Fit Theory*

Task-technology fit theory is a fundamental paradigm in the field of information systems that allows for the analysis of the interaction between technology and task requirements in many domains (Spies et al., 2020). The efficacy of technology in a particular context depends on its alignment with the specific tasks it intends to facilitate, as initially conceived by Goodhue and Thompson in the mid-1990s. Figure 1 illustrates the theory's emphasis on two primary variables: task characteristics, which involve the activities and objectives to be accomplished, and technology characteristics, which encompass the functionalities and capabilities of the technology. The alignment between these variables is crucial; achieving optimal congruence results in enhanced performance and user content, while a lack of alignment can lead to inefficiencies and underutilisation of technology. This notion emphasises the significance of aligning technical instruments with task requirements to achieve effective results (Goodhue & Thompson, 1995).

According to this notion, when technology is appropriately aligned with the task's requirements, there is a concurrent enhancement in both the efficiency and effectiveness of executing the activity. In contrast, when there is a lack of alignment, this might result in less than ideal results where the full potential of technology is not achieved (Tolentino, 2020).

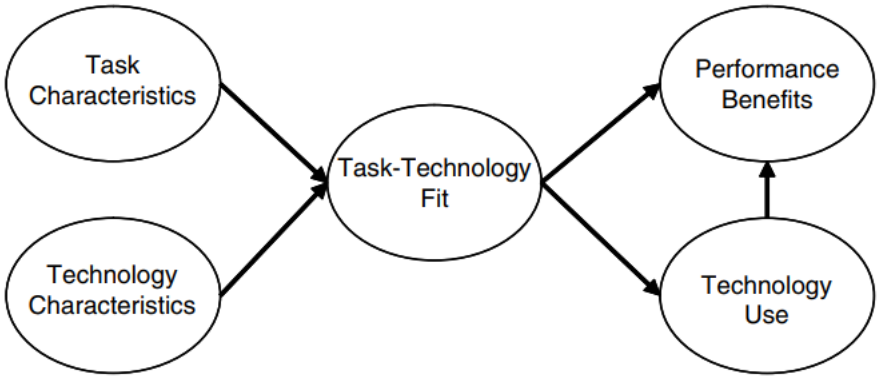


**Figure 1.** Task-Technology Fit Theory

(Goodhue and Thompson, 1995)

Within the realm of education, specifically in relation to the incorporation of technology into curriculum delivery, task-technology fit theory provides a valuable framework for examination (Alyoussef, 2021). This statement urges educators and researchers not only to contemplate the integration of technology into educational environments but also to reflect on the specific educational goals and learning activities that the technology is designed to facilitate (Sabah & Altalbe, 2022). This approach redirects attention from technology as a final objective to technology as a method for attaining more efficient educational results.

The theory's relevance in educational contexts is clear in the increasing amount of literature investigating the congruence between educational technologies and pedagogical objectives (Perez et al., 2023). Studies have examined the compatibility of various technological tools with different learning activities in online and blended learning environments. This examination has impacted student engagement and learning results (Venkatesh & Bala, 2008; Tarafdar & Vaidya, 2006).

In general, this idea offers a strong foundation for assessing the impact of technology in educational settings. This study provides a detailed analysis of how technology can be successfully incorporated to support and improve the implementation of a multicultural curriculum. This emphasises the importance of aligning technology with the specific characteristics of the tasks at hand. In addition, this study identified and examine the various factors that may impact students' performance in this context.

*2.2 Multicultural Education and Curriculum Development*

According to Spring (2017), multicultural education is a direct response to the growing diversity of schools globally and to the need for a more inclusive and comprehensive approach to education. These educational views gained prominence in the latter part of the 20th century, promoting a curriculum that acknowledged and valued the varied cultural origins of all pupils (Banks & Banks, 1995). The essence of multicultural education lies in its commitment to equity and social justice, aiming to transform the educational experience into one that acknowledges and values diverse cultural perspectives. This aligns with sustainable development goal (SDG) 4, which aims to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all (Smith et al., 2020).

Curriculum development in the context of multicultural education has been an ongoing process characterised by the integration of content, concepts, paradigms, and perspectives from various cultural groups into the educational curriculum (Gay, 2010). This approach seeks to include diverse cultural content and reconsider teaching methodologies and assessment strategies while considering these diverse perspectives. The development of such a curriculum is a complex task that involves the re-examination of existing educational materials, teaching practises, and evaluation methods to ensure that they are culturally responsive and inclusive (Arvanitis, 2018). This effort directly supports SDG 10, which seeks to reduce inequality within and among countries by promoting social, economic, and political inclusion of all, irrespective of age, sex, disability, race, ethnicity, origin, religion, or economic or other status (Basnett et al., 2019).

China's adoption of multicultural education, driven by rapid socioeconomic evolution and increasing global interactions, highlights the need for a globally and culturally diverse curriculum (Chen, 2010). This is particularly pertinent in Beijing, a city marked by significant cultural diversity where implementing such curricula is essential

(Zhang & Chen, 2014). These curricula equip students with the skills required for a multicultural world, emphasising intercultural competence. Additionally, Tang et al. (2023) reported that in Guangdong, China, educators' effectiveness is enhanced by the use of multimedia in educational activities, indicating the positive impact of technology integration in multicultural educational settings. Incorporating technology can further enhance access to inclusive education, a key component of SDG 4, by broadening learning opportunities and making education more accessible to diverse student populations. We believe this has implications for our research as well.

*2.3 Task Characteristics in Multicultural Education*

The concept of task characteristics in multicultural education is pivotal for understanding how curricular content and pedagogical strategies align with the diverse needs of students (Berlian & Huda, 2022). In the realm of multicultural education, task characteristics typically refer to the nature and design of educational activities, learning objectives, and overall educational goals intended to promote cultural awareness and inclusivity (Banks & Banks, 1995). The key components of task characteristics in this context include the complexity of curriculum content, diversity of perspectives represented, and interactive nature of learning activities. Complex curriculum content in multicultural education often involves integrating histories, narratives, and viewpoints from various cultural backgrounds, challenging students to think critically and empathetically about global and societal issues (Gay, 2010).

Another crucial aspect is the incorporation of diverse perspectives. This involves not only the inclusion of content from various cultures but also the way this content is presented and discussed. A pedagogical approach is needed to encourage students to explore and respect different cultural viewpoints, thus fostering an environment of mutual understanding and respect (Ladson-Billings, 1995).

Moreover, interactivity in learning activities in multicultural education is significant. Interactive tasks, such as collaborative projects, discussions, and cultural exchanges, are instrumental in facilitating an immersive and engaging learning experience. These activities enable students to actively participate in their learning process, thereby enhancing their understanding and appreciation of cultural diversity (Sleeter & Grant, 2009).

From the above findings, we are aware that task characteristics in multicultural education are essential for creating a learning environment that not only imparts knowledge about different cultures but also actively engages students in understanding and appreciating cultural diversity. This approach aligns with task technology fit theory, which emphasises the importance of aligning educational tasks with appropriate technological tools to enhance learning outcomes.

*2.4 Technology Integration in Education*

The incorporation of technology into education signifies a transition from conventional teaching methods to more dynamic, interactive, and student-focussed approaches made possible by technological progress (Feist & Reid, 2018). Technology is crucial for improving the delivery and efficacy of the curriculum in intercultural education (Parkhouse et al., 2019).

The technology used in educational contexts encompasses various tools, such as digital learning platforms and multimedia resources. Each of these tools has distinct qualities that can effectively enhance the learning experience (Haleem et al., 2022). These technological tools empower educators to provide knowledge in various captivating ways, accommodating various learning styles and preferences (Mayer, 2001). For example, the use of digital storytelling and virtual reality can enhance students'comprehension of many cultures by creating immersive learning encounters that animate cultural narratives (Leow & Ch'ng, 2021).

In addition, technology enables enhanced access to diverse knowledge and resources, thus dismantling geographical and cultural obstacles. Online collaboration tools and global communication platforms facilitate connexions between students of various cultural backgrounds, thereby promoting global consciousness and enhancing intercultural communication abilities (Greenhow & Lewin, 2016). However, there are hindrances to the effective incorporation of technology into the educational system. Addressing challenges such as the digital divide, the need for teacher training in technical capabilities, and verifying the applicability of technology for certain educational objectives are essential (Zhao & Frank, 2003). The need to align technological tools with teaching aims and curriculum material is emphasised by this, as corroborated by task-technology fit theory.

*2.5 Student Performance in Multicultural Educational Settings*

The inclusion of multicultural education, which emphasises diversity and inclusivity, adds a distinct aspect to the assessment of student achievement (Banks, 2004). The core of this assessment lies in acknowledging that successful learning in multicultural environments extends beyond the acquisition of academic knowledge. It involves pupils'

capacity to recognise, comprehend and actively participate in cultural distinctions. Education in this aspect equips pupils with both the academic and social skills necessary for navigating a society where cultural contact is commonplace (Ladson-Billings, 1995).

Therefore, assessing student performance in such settings requires a more complex methodology. Traditional metrics, such as exam results and academic grades, are enriched by evaluations of students' intercultural competencies and viewpoints on diversity. The difficulty lies in creating evaluation instruments that precisely mirror these more comprehensive educational objectives (Gay, 2010).

Furthermore, the significance of task characteristics and technological integration in multicultural settings is paramount. The organisation of assignments and the utilisation of technology can greatly impact students' involvement in the curriculum and, consequently, their academic achievement. Integrating technology effectively into a curriculum and providing culturally relevant and interesting assignments can improve students' learning experiences and outcomes (Sleeter & Grant, 2009).

*2.6 Theory Framework and Hypotheses*

This study uses task technology fit theory as its fundamental framework to examine the interactions among several variables in the context of multicultural education. The theoretical framework was constructed using task-technology fit theory as the foundation, and we modified certain variables to align with the specific characteristics of this study. This study examined the correlations among the variables Task Characteristics (Tac), Technology Characteristics (TeC), Task-Technology Fit (TTF), and Student Performance (SP).

Figure 2 represents the variables' structure and their relationships. This is the basis for us to propose this research hypothesis. Tac encompasses the nature and demands of the tasks involved in multicultural education. This includes aspects such as the complexity of the curriculum, the inclusivity of diverse cultural perspectives, and the interactive nature of learning activities. Theory indicates that these characteristics influence the effectiveness of the educational process. Furthermore, TeC involves the features and functionalities of the technology used in the educational setting. This includes the accessibility, usability, and appropriateness of technological tools for delivering multicultural content. The theory posits that these characteristics are crucial for the successful integration of technology into education. In addition, TTF examines the alignment between task characteristics and technology characteristics. Theory argues that a higher degree of fit leads to more effective and efficient task completion. In the context of this study, a good fit would mean that the technological tools used are well suited to the tasks of delivering and engaging students with the multicultural curriculum. SP represents the outcome of the educational process and is measured in terms of academic achievements and cultural competencies. The theoretical framework proposes that an optimal task-technology fit positively impacts student performance, enhancing both academic success and intercultural understanding.

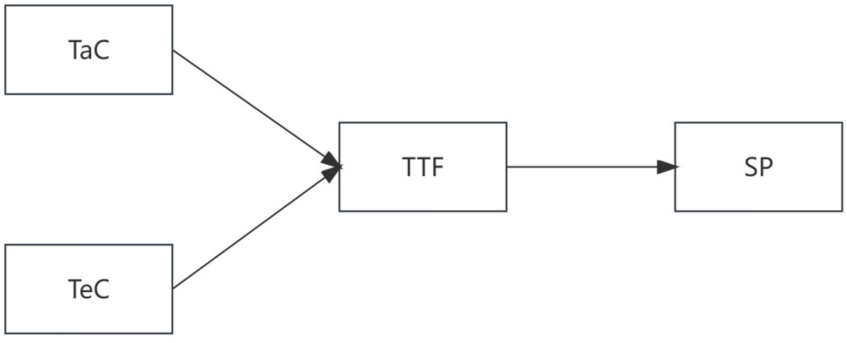


**Figure 2.** Research Model

The links established in this framework indicate that the successful incorporation of technology, in accordance with the particular demands of multicultural education tasks, will result in enhanced student achievement. The relationship between technology and educational tasks is influenced by the degree to which technology aligns with these activities, as shown by the fundamental principles of task-technology fit theory.

Building on the research model, this study proposes several hypotheses to explore the relationships between the variables identified above. These hypotheses empirically verify the theoretical assertions drawn from the task-technology fit theory.

Hypothesis 1 (H1): Tac positively influences TTF.

Hypothesis 2 (H2): TeC positively influences TTF.

Hypothesis 3 (H3): TTF positively influences SP.

## 3. Methodology

### *3.1 Research Design*

This study employed a quantitative research approach, utilising a cross-sectional survey design to collect data from educators and students in Beijing high schools. This design allowed for the examination of the relationships among the key variables of interest: TaC, TeC, TTF, and SP. The data were analysed using SEM technique with the professional data analysis tool SPSSPRO. SEM analysis was chosen for its ability to simultaneously examine multiple relationships among latent variables, making it well suited for testing the proposed research model and hypotheses.

### *3.2 Sample Selection and Participants*

Purposive sampling was employed to select participants from Beijing high schools that had implemented multicultural curricula and integrated technology into their teaching practises. This sampling strategy ensured that the participants had direct experience with the phenomena under investigation. The specific population included both educators and students to capture a comprehensive view of the impact of technology integration on multicultural education.

To determine the appropriate sample size for this study, several factors were considered. First, the requirements for the SEM analysis were considered. According to Kline (2023), a minimum sample size of 200 is generally recommended for SEM to ensure robust results. However, the actual sample size required may vary depending on the complexity of the model, the number of parameters to be estimated, and the desired level of statistical power (Wolf et al., 2013). Furthermore, the potential for non-response and incomplete data was considered when determining the sample size. Baruch and Holtom (2008) suggested that the average response rate for surveys in organisational research is approximately 35%. To account for potential non-responses and ensure an adequate final sample size, the initial sample size was increased accordingly.

### *3.3 Data Collection*

Data were collected using an online structured questionnaire hosted on a professional platform (www.wjx.cn). This platform was chosen for its wide accessibility, user-friendly interface, and data security features. The questionnaire was distributed to the selected high schools, and the participants were invited to complete the survey voluntarily. The online format allowed for efficient data collection while minimising the risk of data entry errors. The questionnaire remained open for a period of four weeks, with reminder Wechat Notices sent to participants at the two-week mark to encourage completion. Upon closing the survey, the data were downloaded and prepared for analysis.

### *3.4 Questionnaire Design*

The questionnaire was designed to assess the key variables TaC, TeC, TTF, and SP. The questionnaire was structured to include both specific items related to these variables and a demographic section to gather background information on the respondents, such as gender, role (teacher or student), and experience with multicultural curricula.

The respondents rated each statement on a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree), allowing for nuanced quantitative analysis.

The questionnaire consists of four main sections, each corresponding to a variable, as shown in Table 1. The items in each section were developed on the basis of a comprehensive literature review and adapted to fit the context of multicultural education and technology integration in Beijing high schools. The TaC section assessed the perceived complexity, relevance, range of cultural perspectives, and level of interaction required by the curriculum. The TeC section evaluated the accessibility, functionality, and user-friendliness of the technological tools used in the curriculum. The TTF section measured the alignment between the technology used and the goals of the multicultural curriculum, and the frequency of technology usage in curriculum learning. Finally, the SP section assessed academic performance and additional indicators of cultural competencies and intercultural understanding. Respondents rated

each item on a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree). The questionnaire also included a demographic section to gather background information on the respondents, such as gender, role (teacher or student), and experience with multicultural curricula.

**Table 1.** Questionnaire Structure

| Variables | Items design |
|---|---|
| TaC | The items in this section measured the perceived complexity, relevance, range of cultural perspectives, and level of interaction required by the curriculum. |
| TeC | This section assessed the accessibility, functionality, and user-friendliness of the technological tools used in the curriculum. |
| TTF | The items evaluated the alignment between the technology used and the goals of the multicultural curriculum, along with the frequency of technology usage in curriculum learning. |
| SP | This section measures academic performance and additional indicators of cultural competencies and intercultural understanding. |

### *3.5 Data Analysis*

The collected data were analysed using a two-stage SEM approach in SPSSPRO. In the first stage, the measurement model was evaluated to assess the reliability and validity of the constructs. The model fit was assessed using various fit indices, such as the chi-square statistic, comparative fit index (CFI), Tucker-Lewis index (TLI), and root mean square error of approximation (RMSEA). In the second stage, the structural model was tested to examine the hypothesised relationships among the variables. The direct and indirect effects of TaC, TeC, and TTF on SP were evaluated, along with the significance of the path coefficients. The model fit was again assessed using the aforementioned fit indices. In addition, multi-group analysis was performed to explore potential differences in the relationships based on demographic factors, such as the role of the participants (teachers vs. students) and their level of experience with multicultural curricula.

## 4. Results

In this study, the demographic composition of the respondents encompasses a total of 280 individuals, revealing a skew towards female participation, with 172 female respondents (61.4%) contrasting with 108 male respondents (38.6%). The roles within the educational setting are predominantly occupied by students, who constitute 67.1% of the sample (188 individuals), while teachers represent 32.9% (92 individuals). The respondents' experience with multicultural curricula varied, with the majority (44.6%, or 125 individuals) indicating 3 years of engagement. The other levels of experience were distributed as follows: 35 respondents (12.5%) had 1 year, 38 respondents (13.6%) had 2 years, 37 respondents (13.2%) had 4 years, and 45 respondents (16.1%) had 5 years of experience. This demographic data overview, as shown in Figure 3, is characterised by a preponderance of female students and a broad spectrum of experience in multicultural curricula and is integral to elucidating the diverse backgrounds and insights of the participants, thereby enriching the study's exploration of perspectives on multicultural education.

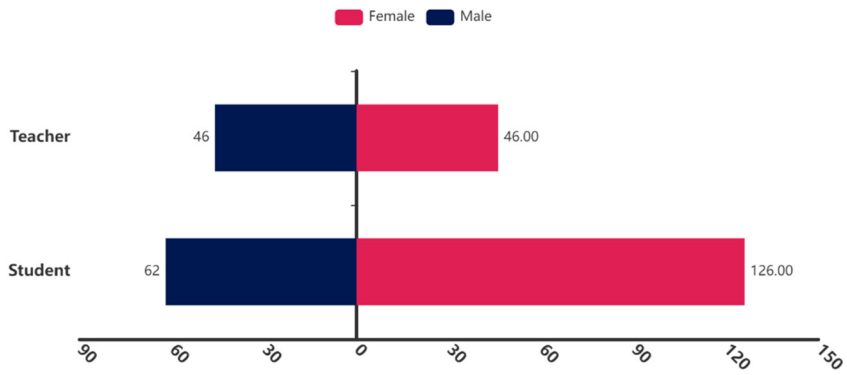


**Figure 3.** Respondent Overview

In the study examining the impact of multicultural curricula on student performance in Beijing high schools, the Kaiser – Meyer – Olkin (KMO) test and Bartlett's test of sphericity provided crucial statistical assurances regarding the methodological robustness of the research, as shown in Table 2. The KMO value of 0.805 significantly surpasses the accepted threshold for factor analysis suitability, indicating that the dataset is well suited for identifying underlying relationships between variables. Similarly, Bartlett's test of sphericity confirmed the appropriateness of the data for structural equation modelling, with an approximate chi-square value of 1729.47 and a highly significant p value (<0.001). These results collectively affirm the reliability and relevance of the questionnaire used, ensuring that the analysis, particularly focussing on the interplay among TaC, TeC, TTF, and SP, is grounded in a statistically sound foundation. This thorough statistical validation is fundamental for exploring the complexities of technology integration in multicultural educational settings and its subsequent effects on student outcomes.

**Table 2.** KMO Test and Bartlett's Test of Sphericity

| KMO Value | | 0.805 |
|---|---|---|
| Bartlett's Test of Sphericity | Approximate Chi-Square | 1729.47 |
| | df | 66 |
| | P | 0.000*** |

Note: ***, **, and * represent significance levels of 1%, 5%, and 10%, respectively

In addition, we chose to use the SEM approach because of its ability to assess intricate models with multiple variables and hypotheses. This approach provides various important indices that indicate the suitability and effectiveness of the model, as shown in Table 3.

An initial chi-square ( $\chi 2$) statistic of 150.640 with 50 degrees of freedom and a p value of 0.000 indicates a poor model fit. Note that the $\chi 2$ statistic is sensitive to sample size, leading to model rejection in large datasets (Kline, 2015). Thus, this index is a typical measure of fit, but it is limited by the use of large sample sizes, as in our study. Unlike the above values, the chi-square/degree-of-freedom ratio ( $\chi 2$/df) provides more detailed insight, with a value of 3.013. Although significantly higher than the recommended criterion of 3, this value provides a moderate model fit (Byrne, 2013). This result surpasses the ideal criterion but is within an acceptable range, indicating model fit.

**Table 3.** Model Fit Indicators

| Common indicators | $\chi 2$ | df | p | $\chi 2$/df | GFI | RMSEA | RMR | CFI | NFI | NNFI |
|---|---|---|---|---|---|---|---|---|---|---|
| Criteria for judgement | - | - | >0.05 | <3 | >0.9 | <0.10 | <0.05 | >0.9 | >0.9 | >0.9 |
| Values | 150.640 | 50 | 0.000 | 3.013 | 0.922 | 0.085 | 0.012 | 0.941 | 0.915 | 0.922 |
| Other indicators | TLI | AGFI | IFI | PGFI | PNFI | PCFI | SRMR | RMSEA 90% CI | | |
| Criteria for judgement | >0.9 | >0.9 | >0.9 | >0.5 | >0.5 | >0.5 | <0.1 | - | | |
| Values | 0.922 | 0.879 | 0.941 | 0.591 | 0.693 | 0.713 | 0.031 | 0.069 ~ 0.100 | | |

Default Model: $\chi 2(66)=1766.267$, p=1.000

In addition, with a GFI of 0.922, the model is rated higher than the recommended 0.9. These findings suggest that the model fits well. The model approximation error is moderate, as the root mean square error (RMSEA) is 0.085, which is above the permissible range. This is supported by the 90% RMSEA confidence interval (0.069 to 0.100). A comparative fit index (CFI), normed fit index (NFI), or non-normed fit index (NNFI or TLI) above 0.9 indicates a well-fitting model. The adjusted goodness-of-fit index (AGFI), at 0.879, is just below the intended level, showing that while the model fits the data well, it might improve upon the previous model. However, this study's theoretical framework is supported by the good-to-moderate fit of most indices. This study provides a solid empirical foundation for understanding technology integration in multicultural education and student performance.

Apart from verifying the model fit, we also need to verify the relationships between the variables; therefore, we need to show the model regression coefficients, as shown in Table 4.

The association between Tac and TTF was demonstrated by a regression coefficient of 0.224 (SE = 0.064), which was significant at a z value of 3.523 (p = 0.000). The positive and substantial influence is supported by a

standardised regression coefficient of 0.388, indicating a modest level of strength in the association. This discovery is consistent with other research that highlights the significance of task variables in determining the efficacy of technology in educational environments (Cheon et al., 2012). TeC had a strong and statistically significant effect on TTF, as indicated by a regression coefficient of 0.195 (SE = 0.056, z = 3.508, p = 0.000) and a standardised coefficient of 0.338. This result aligns with the existing body of research indicating that the attributes of technology, such as ease of use and capabilities, are essential factors in determining its compatibility with educational activities (Venkatesh & Bala, 2008). The impact of TTF on SP is highly significant, as indicated by a robust positive regression coefficient of 0.481 (SE = 0.034, z = 13.961, p = 0.000) and a substantial standardised coefficient of 0.774. The findings of this study provide evidence in favour of the premise that when technology and educational tasks are well matched, student performance is enhanced. This aligns with the fundamental principle of the technology-task fit theory proposed by Goodhue and Thompson in 1995.

**Table 4.** Model Regression Coefficients

| X → Y | Nonstandardised regression coefficients | SE | z (CRValue) | p | Standardised regression coefficient |
|---|---|---|---|---|---|
| TaC → TTF | 0.224 | 0.064 | 3.523 | 0.000 | 0.388 |
| TeC → TTF | 0.195 | 0.056 | 3.508 | 0.000 | 0.338 |
| TTF → SP | 0.481 | 0.034 | 13.961 | 0.000 | 0.774 |

Note: → indicates a regression effect relationship or a measurement relationship; the bar "-" indicates that the item is a reference item.

Furthermore, this study revealed substantial correlations between Tac and its different constituents, and between TeC and its constituents. The links highlight the complex and diverse nature of both tasks and technological characteristics in the educational setting. The significant impact of the TTF on its constituents, as evidenced by elevated standardised coefficients, underscores the paramount significance of the alignment of tasks and technology in educational environments.

To establish a correlation between the numerical values and the research model relationships, Figure 4 provides a clear representation.

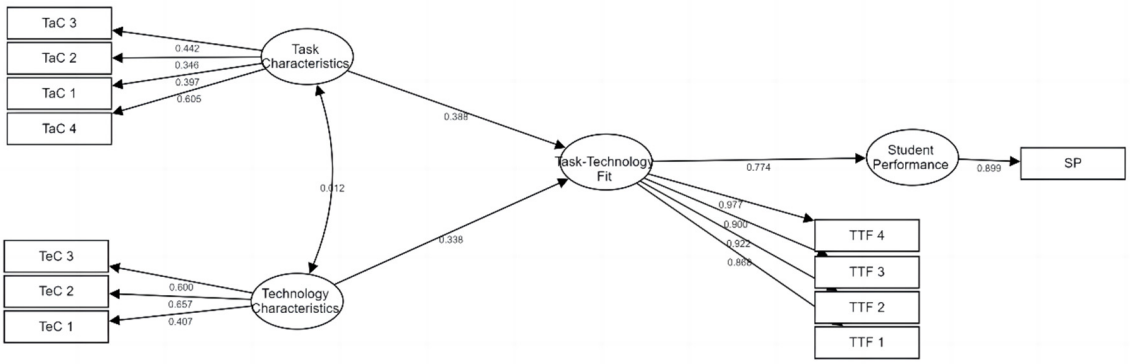


**Figure 4.** Model Results with the Data

## 5. Discussion

The present study's findings offer insightful contributions to the understanding of multicultural education in Chinese high schools, particularly focussing on how technology integration can enhance this educational approach. The results support the theoretical premises of the Task-Technology Fit theory, highlighting the critical importance of aligning task and technology attributes to optimise student performance.

The correlations found between TaC and TTF, as well as between TeC and TTF, reinforce the significance of creating educational activities and selecting technological tools that complement each other effectively. This aligns with previous research, which underscores the importance of employing suitable technologies to bolster instructional tasks and enhance learning outcomes (Cheon et al., 2012; Venkatesh & Bala, 2008). Additionally, this study extends

existing knowledge by demonstrating the applicability of these principles within multicultural education, an area where aligning content and delivery techniques is particularly crucial (Cuccurullo & Cinganotto, 2020; Gay, 2018).

The robust positive impact of TTF on SP aligns with prior studies emphasising the role of technology in facilitating effective learning experiences. The findings are especially pertinent in the context of multicultural education, where the use of well-matched technical tools can significantly improve the delivery of diverse and inclusive information. This supports the core assertion of the Task-Technology Fit theory that compatibility between task demands and technological capabilities is pivotal for influencing the effectiveness of technology use in educational settings (Goodhue & Thompson, 1995).

The findings of this study have profound implications for the development and implementation of multicultural curricula. The alignment of task and technology attributes is crucial not only for enhancing academic performance but also for fostering cultural competencies among students, making it an essential consideration for educators and curriculum designers. This study suggests that educators should carefully evaluate educational tasks and the selection of technology to create a harmonious alignment that enhances learning outcomes.

In addition, the results underscore the need for continuous professional development for teachers, particularly in integrating technology into instructional methods within diverse educational environments. Effective integration of technology into multicultural education can serve as a bridge for students to connect with diverse cultural perspectives and develop critical intercultural skills. This has practical applications in promoting social inclusivity and preparing students to navigate a globally interconnected society.

While this study provides valuable insights, it is crucial to acknowledge its limitations. The focus on high schools in Beijing limits the generalizability of the results to other settings or regions. Future research could explore these associations across different cultural and educational contexts, thereby enhancing the external validity of the findings. Furthermore, the integration of qualitative research could enrich the understanding of students' and teachers' experiences with multicultural curricula and technology, offering a more nuanced view of the dynamics at play.

Exploring other educational levels or contexts, such as primary schools or higher education, could also provide broader insights into the application of technology within multicultural education. In addition, future studies could investigate the long-term impact of aligning task and technology characteristics on student performance and cultural competency development, contributing to the ongoing discourse on educational technology and multicultural education.

## 6. Conclusion

This study meticulously explored the intricate interplay between TaC and TeC and their collective influence on TTF, which subsequently impacts student performance within multicultural educational settings. Through rigorous analysis, the evidence not only validates the hypotheses but also illuminates the transformative potential of aligning educational tasks with technological tools to enhance the efficacy of multicultural curricula.

The findings reveal significant and positive correlations between TaC and TTF, highlighting the importance of designing educational tasks that are inherently complex, inclusive, and interactive. This alignment enhances the effectiveness of technology in educational settings, suggesting that educators and curriculum designers should integrate technological tools that align with the pedagogical goals of multicultural education.

Similarly, the positive influence of TeC on TTF underscores the critical role of technology accessibility, functionality, and user-friendliness in educational success. This finding advocates for a strategic selection of technology that is responsive to the demands of educational tasks, reinforcing the need for educational technology policies that prioritise ease of use and functional relevance.

Additionally, the strong association between TTF and improved SP emphasises the importance of aligning technology with educational tasks. This alignment foster academic achievement and cultivates cultural competencies among students, enriching the learning experience in multicultural settings.

The findings of this study have profound implications for the development and implementation of multicultural curricula. The alignment of task and technology attributes is crucial not only for enhancing academic performance but also for fostering cultural competencies among students, making it a vital consideration for educators and curriculum designers. The study suggests that educators should carefully evaluate educational tasks and the selection of technology to create a harmonious alignment that enhances learning outcomes.

Furthermore, the results highlight the need for continuous professional development for teachers, particularly in

integrating technology into instructional methods within diverse educational environments. Effective integration of technology into multicultural education can serve as a bridge for students to connect with diverse cultural perspectives and develop critical intercultural skills. This has practical applications in promoting social inclusivity and preparing students to navigate a globally interconnected society.

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**Authors contributions**

Wang Jianjun, a student, was the primary writer and researcher for this paper. She led the design, data collection, analysis, and manuscript preparation, coordinating all aspects of the project.

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