# The Role and Considerations of Educational Applications in Achieving Educational Resource Equilibrium

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*Abstract*—After the pandemic, the application and integration of network technology into various educational technologies for teaching purposes are gradually maturing and developing, opening new chapters in the field of education. The rapid development of remote education, online learning, and online training propelled by educational applications has ushered in a new era. The emergence of such educational models also plays a role in promoting the balance of educational resources. Although some regions cannot achieve complete relief due to the lack of access to networks and electronic devices, it marks a positive beginning and suggests new possibilities. Through practical case studies, this article thoroughly analyzes the impact of educational application technologies on the balance of educational resources. It explores the practical challenges that need to be overcome for future development.

*Keywords*—educational development, educational resources, educational technology, distance education

## I. INTRODUCTION

During the lockdowns and isolation of the pandemic, educational technology has experienced rapid development. To some extent, it has overcome traditional education's temporal and spatial limitations, allowing more people to access comprehensive educational resources and breaking through regional and class constraints. This educational approach will enable learners to manage their time flexibly and, at a lower cost, gain access to better and higher-level learning and teaching resources. It represents a pathway to address the uneven distribution of educational resources. While educational technology and remote education have demonstrated clear advantages in improving the allocation of educational resources, what specific role do they play? What challenges and issues may be faced in the current stage and future development?

## II. RESEARCH STATUS ANALYSIS

### A. Educational Inequality

As the process of social development unfolded in the early 20th century, most countries began to expand higher education continuously. However, does the expansion of universities indeed result in educational equity?

Some educators believe that acquiring educational opportunities depends more on personal qualities such as diligence and intelligence than family background. With the expansion of education, all groups can benefit, and educational opportunities tend to equalize [1]. However, American sociologist R.D. Mare argues that these studies have specific problems. To address this, he conducted new research and found that with social development, family background is becoming an increasingly significant factor

contributing to educational injustice [2]. Therefore, it can be established that the determining factors of educational inequality are not solely related to educational investment and teachers but are also manifested in congenital factors such as family economic background. Despite the acceleration of industrial processes and the expansion of the academic scale, equal opportunities in education have yet to be achieved, and the phenomenon of educational stratification persists and intensifies. The social advantage class continues to obtain more educational opportunities through its existing advantageous resources. The reality is that, despite an increase in both the absolute and relative numbers of students worldwide, the disparities between the wealthiest and poorest populations and between rural and urban areas have not narrowed [3].

In the reproduction of human capital investment, a mechanism sometimes forms a reproductive process mediated and manifested by educational levels [4]. On the one hand, school education aims to socialize children from various social classes and integrate them into the same societal value systems. On the other hand, it must be acknowledged that the upper-middle type must preserve its advantage within the educational structure to maintain its advantageous position in the labor market. Thus, in constructing the reproduction theory, there is a gradual awareness of the inherent contradiction and conflict between the reproductive function and the socialization aspect of school education. Despite the widespread emphasis on the idea that "gold will always shine", when facing many job seekers, employers need to make rapid initial selections, and they often rely on evaluating the educational credentials to determine the job allocation of employees in the labor market. At this point, academic credentials serve as the final expression of the value of human capital investment. The attainment of educational credentials is ultimately closely related to family background and the family's investment in human capital.

### B. Development of Educational Technology

With the rise of internet technology, the information age has ushered in a new chapter in the field of education. Scholars have been particularly attentive to the application and development of educational technology in teaching and learning since the first attempts to integrate information technology into education [5]. From the earliest days of televised instruction to open education, distance learning, online education, and internet-based education, each technological innovation has brought about new educational changes. From slides, overhead transparencies, and recorded television lessons to online education platforms and the

current interactive software used in remote teaching support, technology has increasingly permeated the application in the field of education.

Currently, Fullerton from California State University sees technology as influencing the education market and changing educators' teaching methods [6]. Information technology can address various challenges and problems in business education, ultimately promoting transformative changes in the education sector in the long run. However, many scholars also believe that while the Internet has positively changed the education industry, issues still need to be addressed. In his article "Why aren't Computers Used More in Schools?", American scholar Tom Loveless explicitly points out that information technology will drive educational transformation. Still, these technologies need to be fully utilized in current teaching practices. Considering the difficulties in regulation, computers, and educational technology still need to be fully integrated into traditional teaching processes, both in terms of students' self-discipline and the nature of assignments hindering the comprehensive development of educational technology [7].

In conclusion, with the penetration and application of educational technology in practical teaching, the education model is undergoing significant changes, moving in a positive direction. However, it could be better at the current stage, and many issues urgently need to be addressed.

## III. THE DEVELOPMENT OF EDUCATIONAL TECHNOLOGY AND ITS IMPACT ON THE BALANCE OF EDUCATIONAL RESOURCES

The rapid development of educational technology is gradually and effectively alleviating this issue. Remote education maximizes the enrichment and balance of shared educational resources through video recording, online conferences, sharing of video materials, and electronic versions of materials.

### A. The Application of Educational Technology Allows Teaching to Shift towards a Student-Centered Approach

As societal progress advances, nations worldwide realize that talent is the driving force behind national development. A necessary condition for social development is possessing talent in various fields. The challenge lies in cultivating highly skilled workers, innovative individuals, and people with lifelong learning abilities. The scope of talent selection should not be confined to exclusive circles but should aim for as fair a filtering process as possible, open to everyone.

However, due to factors such as regional disparities, economic development, traditional beliefs, and limitations in teacher income and career development, as well as the closed nature of channels for resource acquisition, it is challenging to ensure that students in all regions have equal access to resources. The widespread application of educational technology currently breaks through these limitations. The extensive use of educational technology in remote education allows scholars to share teaching resources across different countries. Educational technology brings innovations in various aspects of education, including modes of thinking, learning, and teaching. At the same time, it presents new challenges and explorations for existing education systems. What kind of talents should we cultivate? This is the fundamental impact of educational technology on education.

For traditional education perspectives in Asian countries, the assessment criteria such as "judging by exam results", "measuring the quality of school education by the enrollment rate", and "evaluating teachers' proficiency based on teaching performance" have not only resulted in excessive psychological pressure and academic burdens on students but have also impacted the mental and physical health of teachers and influenced their choices of work locations. This approach has even affected the allocation of regional educational resources.

In contrast to the traditional "large-scale, mass production, standardization" model of talent development, educational technology, remote education, and other information-based training models can better cater to individual students. Adopting a "personalized, customized, and combines the virtual and the real" approach facilitates the cultivation of personalized talents. This not only strives for fair sharing of educational resources but also reorients education towards a human-centric goal, aiming at achieving individualized and comprehensive free development guided by the needs of the learners.

The application of educational technology also provides scholars with greater freedom in choosing their learning locations and times. In traditional teaching models, if one wishes to access teaching resources from other countries, the best option might be studying abroad, but this comes with a high foundation of time and financial costs. While most countries have a certain number of international schools, the high tuition fees and the concentration of these schools in economically developed cities make them inaccessible to all scholars. Even for students in the K-12 stage, during the period primarily dedicated to learning, there are numerous restrictions on accessing more extensive and enriched educational resources. The development of remote education makes educational resources more affordable and flexible in terms of time. The advancement of educational technology expands the scope of education from specific groups in traditional teaching to all members of society, creating an environment for lifelong learning and socialized learning. Educational technology can maximize the integration of educational resources, enabling education to transcend geographical, cultural, and temporal boundaries.

### B. Teaching Case Study

In early 2023, as students at the Pepperdine University EDOL program, we reached out to Daicel Safety Systems Thailand (DSST). Like many international companies, DSST faced a significant challenge in sustaining language barriers. The lack of similarities between Thai and English in writing, reading, or speaking posed a substantial obstacle between senior staff and their frontline employees. Unfortunately, Thai is not commonly used in the United States. However, English is becoming increasingly popular in Thailand, and the demand for Thai citizens to learn English as a second language is growing. As most school-age children begin learning English as a subject in what we consider primary school, this benefits employees in the company who speak English or a language other than Thai.

DSST hoped that help could design a new English language teaching model course that aligns with the school's

current curriculum for the children of frontline employees. In Asian cultures, especially in Thai culture, people take great pride in their work and efforts on behalf of their families. Parents are very interested in what their children learn and produce, starting early in primary school. If there is a way for children to learn English, especially from American teachers, Thai parents would quickly seize the opportunity to improve their children's learning.

Due to factors such as living area and family income, children in these families often need more opportunities to access educational resources in the United States. While international education in Thailand is highly advanced, most of these resources are concentrated in the economically more developed Bangkok area. Even though the team members tasked with designing this educational program have lived in the United States for many years, they are non-native English speakers. This aspect brings greater empathy for learners; all team members are English learners with educational backgrounds.

For this purpose, we designed specialized teaching materials using educational technology, including instructional animations and reading materials. We implemented an English literacy volunteer activity through a teaching model that combined remote education with face-to-face teaching. In addition to having students' study at home during class time, we also required parents to be present during the lessons. This created an environment for parents to be exposed to basic English learning levels.

Throughout the project, we successfully created a prosperous and inclusive learning environment for the students. By prioritizing certain vital elements, we fostered a calm and enthusiastic atmosphere where each student's unique personality could be expressed. One fundamental aspect of our approach was encouraging more student interaction to facilitate the scaffolding method. We recognized that shy or introverted students might need a gentle push to engage actively in the classroom. Interestingly, we observed that introverted students found relaxing easier with remote education during the teaching process. We cultivated an environment where students could freely express their thoughts and ideas through carefully designed group activities, icebreakers, and engaging discussions. Gradually, we observed a significant transformation as previously introverted students began to participate more confidently in various classroom activities, often without being prompted.

## IV. The Future Development of Educational Technology in Balancing Educational Resources

In the fast-paced digital era, education has embraced technology to enhance the learning experience. However, the rapid transition to virtual learning environments poses unique challenges for students, especially those who are initially shy or need help accessing technology. Case projects, for example, encounter difficulties for these students in virtual environments.

In recent years, the transition to virtual classrooms and remote education has been a significant adjustment for both students and educators. For shy students, virtual environments may require more time to adapt than traditional classroom settings. Without the comfort of peers or familiar surroundings, they may need more encouragement from teachers and additional motivation. For K-12 students, who may have weaker attention, self-control, and self-efficacy, challenges could hinder their learning and engagement. Virtual environments lack informal interactions that typically help shy students gradually open up and build connections, making it more challenging to break the ice and contribute to class discussions.

Beyond the challenges, there is also the issue of limited technology access. Due to budget constraints, several students may only have access to a laptop or shared device. In such cases, interacting with each student becomes challenging as the time available for individual attention is limited. As teachers, we often need help to adjust our approaches based on each student's needs, which may leave some students feeling neglected or overlooked. This also indicates that the widespread deployment of basic network infrastructure and teaching equipment must achieve full coverage quickly.

Additionally, in the virtual teaching environment, students and teachers lose the advantages of body language and facial expressions, which typically aid communication. It's challenging to see each student's facial expressions on the screen, hindering the use of body language and facial expressions, which are common in teaching and often help overcome language barriers. Body language can convey non-verbal cues, emotions, and intentions, enhancing understanding between individuals. Shy students may rely on visual cues to gauge the teacher's reactions or gather the courage to speak up. Students may feel disconnected and need this valuable non-verbal communication to express themselves effectively.

Addressing these challenges requires a multifaceted approach. Educators must strive to create a welcoming and inclusive virtual environment to foster interaction and engagement. Additionally, educators need to be more observant than in traditional classrooms to understand the states of all students.

The application of educational technology and the popularization of remote education face significant challenges, particularly in economically underdeveloped regions. While the widespread availability of the internet and the prevalence of computers form the foundation for technology-driven teaching, achieving this in areas where even basic needs are not guaranteed remains difficult. The diversity of educational technology adds an element of interest to remote education, but it also challenges educators to stay informed about students' situations.

At the current stage, the capacity of educational technology to balance educational resources is limited. It can only play a redistributive role in countries with a certain level of economic security. According to statistics from the People's Daily, English-language resources comprise over 97% of all materials available on the internet, French-language resources account for about 2%, and Japanese-language resources are less than 1%. In contrast, Chinese-language resources constitute only a fraction of a percent. Considering that the global Chinese-speaking population comprises more than a quarter of the world's population, the disparity in the quantity of Chinese-language resources is striking. Overcoming the obstacle of insufficient availability of

educational resources, especially in Chinese, remains a challenge for the future development of educational technology in balancing educational resources.

## V. CONCLUSION

The traditional education teaching model revolves around a teacher-centered approach, where the teacher imparts knowledge relying solely on their experience and professional expertise. In this model, the teacher is the absolute authority in the classroom. Due to the limitations of regional development, differences in salary levels, and the reliance on teacher experience and expertise, economically underdeveloped areas need help attracting highly skilled teaching resources. Additionally, the significant information gap between economically developed and underdeveloped regions means that many families in less developed areas need to be made aware of trends in educational development and the disparities in education levels compared to the other regions. This lack of awareness further results in many parents having an incorrect understanding of the importance of education. As the gap widens, there is an increasingly extreme distribution of educational resources, leading to significant polarization and deviation.

The development of educational technology and distance education has, to a certain extent, alleviated the unequal distribution of educational resources, but it has not been entirely resolved. In regions where the overall economic development is lagging, the internet cannot provide comprehensive coverage, and where the necessary infrastructure for building virtual education platforms is entirely lacking, ensuring education becomes a significant challenge. Additionally, due to varying national restrictions on internet security, reaching a consensus on how educational resources can be more comprehensively made publicly available still needs to be solved.

## CONFLICT OF INTEREST

The author declares no conflict of interest.

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