



# Technology Experience: Postsecondary Education Exploration by Non-native English-Speaking Immigrant Parents

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**Abstract.** The availability and advancement of technology continue to shape the American educational landscape. This makes the exploration of postsecondary education options accessible to all users seeking information about postsecondary education, including non-native English-speaking parents. Despite the acculturation issues faced by immigrants, technology has become an effective tool that enables them to navigate and get accustomed to their new milieu. Amidst the advancement and positive attitude to technology, there is sparse research on how the environment, behavior, and personal factors influence the use of technology by non-native English-Speaking immigrant parents to explore postsecondary education options for their children's success. The goal of this phenomenological study was to identify how the environmental, behavioral, and personal factors influence the use of technology by non-native English-speaking immigrant parents in Iowa, United States to support their children toward postsecondary education. Three main themes emerged after careful analysis of the descriptive data from the semi-structured interviews and demographic survey. The findings show that the interdependent nature of the environmental, personal, and behavioral factors contributes to the perceived usefulness and ease of use which influence the attitude of immigrant parents to use technology to access educational information to support the attainment of postsecondary education for their children. The outcome of this study contributed to the development of a Technology-Mediated Community-Level model. This model allows postsecondary education institutions to collaborate with local organizations to structure educational information in a simplified format accessible to users in their respective native languages via technology.

**Keywords:** Cross-Cultural design · Human-Computer Interaction · User engagement

## 1 Introduction

Postsecondary education in today's advanced technology-driven world provides opportunities and "critical avenues for social mobility and economic success in the United States" [1]. Being educated beyond high school is no longer a symbol of luxurious status; instead, it is a hub for innovation and creative thinking [2]. The United States'

long-term economic health depends on innovation and creativity [3]. Given the extent to which postsecondary education is important to an individual and society, much attention is required to ensure the full cultivation of the benefits associated with continuing education past high school.

Over the past two decades, enrollment in postsecondary education within the United States has increased dramatically. According to the U.S. Department of Education, and the National Center for Education Statistics (2018), from 2000 to 2015, postsecondary education – undergraduate enrollment increased by 30%, a jump from 13.2 million to 17 million students. The U.S. Department of Education projects enrollment to increase to 19.3 million students by 2026 [4, 5]. Enrollment in U. S. postsecondary institutions will increase by 15%, with the largest increase coming from underrepresented populations, including students from immigrant families [6].

The advancement and demand for technology continues to shape the American educational landscape [7] and makes the exploration of postsecondary education options accessible to all users. End-users, including non-native English-speaking immigrant parents living in the United States, can utilize the opportunity of technology integration, as adapted by several postsecondary education institutions, to support their children's educational success. The adaptation and use of technology by immigrant parents is dependent on several factors such as the economy, environment, and personal behavior of the end user. Understanding users' motivation, especially users with diverse cultural and educational background experiences outside the American culture and educational system, is important to foster an effective use of technology in this case, within the context of education. Technology in this study refers to information technology.

The goal of this phenomenological study is to identify how the environmental, behavioral, and personal factors influence the use of technology by non-native English-speaking immigrant parents in Iowa, United States to effectively support their children toward postsecondary education. Studying and establishing an in-depth understanding of these experiences is immensely important to an immigrant nation such as the United States. Furthermore, this study will enable stakeholders such as postsecondary educational institutions, support programs, and designers to gain an in-depth understanding of the immigrant population and through technology disseminate educational information from a cross-cultural perspective.

## 2 Background of the Study

Students from immigrant families constitute a higher percentage of the growing population of students within the U.S. educational system. The integration of technology into education presents non-native English-speaking immigrant parents with opportunities to explore postsecondary education as a tool to help their children become productive citizens of their chosen country.

Fortunately, the most recent groups of immigrants to the U.S. have already exposure and experience with technology usage. Research surrounding the experiences of non-native English-Speaking immigrant parents and the influence of the environment, behavior, and personal factors on technology usage is deficient. Culturally, non-native born immigrant parents deem it as an obligation to support their children for postsecondary

education due to the value it offers them and the society. These developments indicate the importance of research into individual experiences with technology, especially for non-native English-speaking immigrant parents, and how the environment, behavior, and personal factors influence how they utilize technology to explore postsecondary education options for their children.

Most research about humans' experiences with technology within education is focused on students' learning experiences, teachers' experiences with educational technology, and users' psychological experiences [8]. However, social development (constructivism) theory argues that the construction of knowledge and meaning is based on experiences embedded within social interaction [9]. According to Vygotsky's social constructivism theory, parental involvement in a child's education is critical since the parent serves as the More Knowledgeable Other (MKO). The parent within the context of MKO is assumed to have a better understanding and higher ability level than the child. Involving parents via sharing educational information significantly contributes to the academic development of students [10]. This study is vital because it helps to ascertain the essence of the lived experiences of non-native English-speaking immigrant parents regarding how the environmental, behavioral, and personal factors influence how they utilize technology to support their children toward postsecondary education.

## **2.1 Parental Involvement through Technology**

Technology has contributed to bridge the gap in collaboration and communication between parents and schools. It has become a significant approach to foster student performance and engagement. Some studies have demonstrated the impact of technology on parental involvement in different contextual frameworks [11, 12, 13].

To investigate the effective use of technology for communication between elementary school teachers and parents, she indicated that some teachers face problems when communicating with parents via the internet [14]. It was revealed in the study that most teachers were not interested in involving parents by using technology that parents perceived to be helpful due to work, personal schedule, and accessibility issues. This continues to be an issue due to the lack of understanding about the means through which information technology can be effectively used to engage parents [15].

Most research about immigrant parental involvement through technology is focused on early literacy development, digital divide and at the K-12 education level [16]. There is not enough research to provide insights regarding the involvement of immigrant parents on how they use technology to gather information to help support their children navigate and explore information for postsecondary education.

## **2.2 Motivation to use Technology**

As posited by Maslow [17], motivation is based on hierarchy of human needs. Low hierarchical needs (physiological needs) must be satisfied before an individual can be motivated to fulfil higher needs (self-actualization).

For instance, the need to utilize technology by immigrant parents to access information for their child's education can be categorized as low-mid to higher hierarchy needs. Their initial motivation to utilize technology upon arrival in the United States

is to help them acculturate to the American culture. Immigrant parents migrate to the United States with a prior technology experience, but their motivation to use technology for education in terms of motivation is a secondary need.

Also, the perceived usefulness and perceived ease of use of a particular technology reflects the attitude of users toward that technology [18]. Several research on motivation and acceptance to use technology has shown that both the perceived usefulness and ease of use significantly influence users' attitude toward technology use and the behavioral intention to use technology [19, 20, 21]. The perceived usefulness, perceived ease of use, subjective norms, and quality of work life of the user significantly determines user's behavioral intention towards technology [22]. Also, the subjective norm and behavioral intention stems from the user's cultural values. The neutrality of culture as one of the main factors/variables of the model has been criticized by researchers. The cultural and social context determines how individuals or groups behave toward technology. Other studies also argue that traditions and values differ across cultures and as a result, the perception and attitude to acceptance and use technology would be different among users with diverse cultural values and background experience [23, 24].

### 2.3 English as a Second Language in America

44% of foreign-born individuals who settled in the United States in 2000 or later were identified to be proficient in English. However, 13% did not speak English at all. 15% of the 41 million foreign-born in America spoke only English as a first language at home [25]. Despite the common trait of migration to the United States among immigrants, those with higher educational attainment (college degree or above) are proficient in the English language (71%). Only 12% among immigrants with less educational attainment i.e., high school diplomas were identified to be highly proficient in English, 67% proficient in English, 40% proficient and 27% could not at all speak English [26].

There is a bad perception of some native-born Americans about individuals that decides to continue to speak their native language. Such perceptions have contributed to the disparity in policies governing how immigrants learn English and a suggestion for the U.S. Congress to maintain bilingualism to sustain language heritage among immigrants [27].

## 3 Methodology

A phenomenological research methodology was used to help obtain an in-depth narrative and meaning of the importance and truth about the shared lived experience of non-native English-Speaking immigrant parents technology use in supporting their children toward postsecondary education [28, 29].

Albert Bandura's Social-Cognitive Theory (1986) and Davis's Technology Acceptance Model (1989) were used as the theoretical framework for the study. Unlike quantitative research that disintegrates a phenomenon to examine its components, a qualitative approach prioritizes understanding the meaning of an experience and how all parts of a phenomenon work together [30]. Cilesiz [8] highly encourages the use of phenomenological inquiry for studies that seek to understand users' experience with technology within the context of education.

Participants consisted of seven (7) non-native English-speaking immigrant parents living in Iowa, U.S. who had children either currently enrolled or who have recently graduated with a form of postsecondary degree. A purposeful sampling method was used to select participants for the study. In qualitative research, the purposeful sampling method is used to strategically select individuals with a shared experience to collect specific information about a phenomenon [31, 32]. Participants were recruited through emails to local immigrant organizations, recommendations, and word of mouth.

The criteria for selecting participants for the study was based on the following:

1. Immigrants to the United States – must be born in a different country outside the United States (foreign-born).
2. Speak a different language other than English as a native language and the country of birth must have other native languages different from the English language. Participants from countries where English was the official language but not the native language were allowed to participate in the study.
3. Migrated to the United States with a prior educational experience outside the United States educational system.
4. Lived in the United States and Iowa for at least 5 years.
5. Fluent in English.
6. Must be at least 40 years of age and with a child(ren) either enrolled or graduated (less than a year) from a postsecondary educational institution in the United States.
7. Own and use technology toward their child(ren)'s postsecondary education.

A brief demographics survey questionnaire, a semi-structured open-ended interview questions, follow-up conversations and a reflective journal were used to collect data. The nature and expectations of the study were explained to all participants and a verbal consent was used to obtain participants' consent for participation in this study. Participants were informed about the confidentiality of the study and their rights. Each participant was assigned a pseudonym different from their legal name to maintain privacy and security of identity. Carefully, each recorded interview was transcribed and a rigorous data analysis using open and focused coding to establish meaning from the collected data and to determine common themes or shared experience(s) was conducted. The modified Van Kaam methodology, suggested by Moustakas [29], was used to analyze the data. After a careful analysis of the data from the seventh interview, the point of saturation was achieved because no new additional information was emerging. At the point of saturation, the inclusion of extra participants to the study would not add any valuable information to the study [33, 34].

## 4 Results

After careful review and analysis of documents including the reflective journal and transcribed interviews three themes emerged to reflect the goal of the study:

1. Parental perception about postsecondary education and technology usage for educational purposes;
2. Community engagement experience: School district and access to technology and college prep programs; and

### 3. Self-value and motivation to support their children's education.

There were seven (7) participants consisting of three (3) males and four (4) females in this study: Makena, Ana, Martin, Mary, Joseph, Olivia, and Dennis. 57% (4) of the participants have been living in the U. S. between 11–20 years and the other 43% (3) have been living in the U. S. for over 20 years. They migrated from Africa, South America, Asia, and the Caribbean. 43% (3) of the participants had a doctoral degree, 29% (2) had a bachelor's degree, 14% (1) had a master's degree and 14% (1) graduated from high school. 100% (7) of the participants indicated that they preferred to use their smartphones the most to access information because of convenience, accessibility and for communication purposes. However, all the participants preferred to use a laptop to access information to support their Childrens' education. They perceived the laptop to be useful and easy to use over the smartphone. Even though the smartphone was convenient to use, it was challenging to use it to access, navigate and comprehend information. The small screen size did not allow them to open multiple pages to compare vital information.

Culturally, most of the participants in this study valued face-to-face interaction with a resourced person to access information about education for their children over interaction via technological platforms. The findings showed that the participants shared different meanings about why they valued face-to-face interaction. However, it was identified that, the participants prior to a face- to-face consultation with an academic resourced person, would use their laptops to access information and establish meaning from the information through the interaction with the resourced person. This helped them to experience and express emotions during the in-person interactions for fear of been perceived as naive. Also, they expressed concern about how communication over the phone always generated issues due to differences in accent. Even though most of the participants were highly educated and proficient in English, they indicated that their prior education experience outside the United States and native language presented some challenges in accessing and comprehending postsecondary education information for their children. It was noted that the different terminologies or jargons used across most post-secondary education/institutions websites made it difficult for them to infer the meaning for comprehensions.

## 5 Discussion

The three main themes that emerged from this study confirmed the validity of Bandura's SCT triadic reciprocal determinism. However, it does not represent the experience of all non-native English-speaking immigrant parents living in the United States.

The findings show that the personal, behavioral, and environmental factors did not operate in isolation from each other. As illustrated through the responses to the interviews, participants shared how their immediate environment and experiences shaped their behavior to use technology toward their child's education. Learning occurs because of an individual's or a group's bidirectional interaction with the environment, personal and behavior factors [35]. The change or development in behavior of a person is not constructed by just a stimulus-observation, instead, it is a construct of multiple stimuli based on self-efficacy that constitute production of the response [35].

### **5.1 Parental Perception about Postsecondary Education and Technology Usage for Educational Purposes**

One significant finding from this study was that most of the participants in the study were highly educated. Their motivation to attain a bachelor's degree or higher was influenced by their extended family background. As a result, they were motivated to inculcate in their children the discipline and culture of attaining higher education past high school as a continuation of the family legacy. They perceived postsecondary education as an avenue to integrate into their host culture as responsible members capable of contributing to the development of the host culture.

Due to collectivist cultural background of the participants, postsecondary education was a catalyst to help minimize their marginalized status enabling them to take up influential leadership positions of service in the workplace and within the community. These factors and technology experience from work enabled them to develop the motivation and confidence to use technology to support their children's education. Their attitude and perceived usefulness of technology for education was based on social trust from their immediate environment [36].

### **5.2 Community Engagement Experience: School District and Academic Support Groups**

The second theme emerged from the influence of the environment in which the participants lived. Some of the participants resided in affluent communities where the school district was well resourced regarding educational technology usage for student learning and parental engagement. As a result, the parents were motivated to use technology to support their children's education and development. This was the same for the participants that homeschooled their children(s). Interestingly, the participants from school districts with college prep programs were less motivated to use technology to help their children. The support received from the college prep program catered for the need to independently use technology to support their child's education. The highlighted phenomenon is that because of the perceived relevance of postsecondary education by the participants they were motivated to use any avenue possible including the use of technology for the exploration of postsecondary education for their children.

### **5.3 Self-value and Motivation to Support their Children's Education**

The findings showed that all the participants migrated to the United States with prior educational experience different from the American educational system. Also, the participants did not grow up using technology. Rather, through the acculturation process, they developed an attitude to use technology. Significantly, it was identified that the participants heavily depended on their immediate cultural/immigrant support groups or a significant other with prior experience as a motivation to use technology to support their children's education. Since they received help from others, they expressed the motivational need to support other immigrant parents to the use of technology.

It is important to note that the identified themes are not independent of each other but rather interdependent of each other. The participants' perceived understanding and

importance of postsecondary education together with technology contributed to their ability to learn through modeling and observation. The findings show that the interdependent nature of the environmental, personal, and behavioral factors contributes to the perceived usefulness and ease of use of technology. Therefore, influencing the attitude of immigrant parents to use technology to access educational information to support the attainment of postsecondary education for their children.

## 6 Conclusion

The need for a user-centered design requires holistic integration of shared experiences to facilitate a cross-cultural HCI (Human Computer Interaction) design and evaluation [37]. This helps to establish contextual framework to ascertain usability issues embedded in culturally influenced conditions [38]. As technology advances, access to information expands and America continues to be the leading destination for immigrants. It is important for educational institutions to use a social capital approach to establish a framework for community-level engagement with immigrants and local communities/organizations. This would help to create more inclusive and effective educational opportunities and experiences for all students.

Social capital uses available structures such as networks, norms and trust between individuals, organizations/society to foster cooperation for mutual benefits [39]. Several studies have shown that the integration of social capital together with TAM, due to social trust ensures a positive attitude and acceptance to use technology [36].

This study contributes to the field of cross-cultural HCI design by suggesting a technology mediated community-level engagement model. The Model helps to create a space that allows educational institutions to collaborate with local immigrant communities and individuals. The goal is to make vital educational information accessible to non- native English-speaking immigrant parents seeking to use technology to support their children for postsecondary education, in their respective native language. This approach could help foster a holistic educational experience for students from immigrant families by eliminating the extra cognitive stress they experience due to lack of parental support in navigating through what so often seems a complex system when accessing information and meaning in the United States K-20 education system.

## References

1. Juarez, C.: The Obstacles Unauthorized Students Face in Postsecondary Education.” Center for American Progress, <http://www.americanprogress.org/article/obstacles-unauthorized-students-face-postsecondary-education>, Accessed 12 Dec 2022
2. Robinson, K.: *Out of Our Minds: Learning to Be Creative*. 3<sup>rd</sup> edn. Capstone, MN (2017)
3. Wagner, T.: Calling all innovators. *Educational Leadership*. College, Careers, Citizenship **69**(7), 66–69 (2012)
4. Staklis, S., Horn, L.: *New Americans in postsecondary education: a profile of immigrant and second-generation American undergraduates*. National Center for Education Statistics, Institute of Education Sciences, US Department of Education. <https://nces.ed.gov/pubs2012/2012213.pdf>. Accessed 12 Dec 2022



5. McFarland, J., et al.: *The Condition of Education 2017*. NCES 2017–144. National Center for Education Statistics (2017)
6. Hussar, W.J., Bailey, T.M.: *Projections of Education Statistics to 2025*. NCES 2017–019. National Center for Education Statistics (2017)
7. Rossitto, C., Bogdan, C., Severinson-Eklundh, K.: Understanding constellations of technologies in use in a collaborative nomadic setting. *Comput. Support. Coop. Work (CSCW)* **23**(2), 137–161 (2014)
8. Cilesiz, S.: A phenomenological approach to experiences with technology: Current state, promise, and future directions for research. *Educ. Technol. Res. Develop.* **59**(4), 487–510 (2010). <https://doi.org/10.1007/s11423-010-9173-2>
9. Vygotsky, L.S.: *Mind in society: The development of higher psychological processes*. Harvard University Press, Massachusetts (1978)
10. Epstein, J.L.: *Homework practices, achievements, and behaviors of elementary school students*. Center of research on elementary and middle schools report no 26. Baltimore, MD: Johns Hopkins University (1988)
11. Tour, E.: Supporting primary school children’s learning in digital spaces at home: migrant parents’ perspectives and practices. *Child. Soc.* **33**(6), 587–601 (2019)
12. Blau, I., Hameiri, M.: (2017). Ubiquitous mobile educational data management by teachers, students, and parents: does technology change school-family communication and parental involvement? *Educ. Inform.* **22**(3) 1231–1247 (2017)
13. Papadakis, S., Zaranis, N., Kalogiannakis, M.: Parental involvement and attitudes towards young Greek children’s mobile usage. *Int. J. Child-Comput. Interact.* **22**, 100144 (2019)
14. Olmstead, C.: Using technology to increase parent involvement in schools. *TechTrends* **57**(6), 28–37 (2013). <https://doi.org/10.1007/s11528-013-0699-0>
15. Patrikakou, E.N.: Parent involvement, technology, and media: now what? *Sch. Commun. J.* **26**(2), 9–24 (2016)
16. Choi, J., Lee, H.J., Sajjad, F., Lee, H.: The influence of national culture on the attitude towards mobile recommender systems. *Technol. Forecast. Soc. Chang.* **86**, 65–79 (2014)
17. Maslow, A.: *Motivation and personality*. New York, NY: Harper (1954)
18. Davis, D.: Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Q.* **13**(3), 319 (1989). <https://doi.org/10.2307/249008>
19. Hussain, A., Mkpojiogu, E. O., Yusof, M. M.: Perceived usefulness, perceived ease of use, and perceived enjoyment as drivers for the user acceptance of interactive mobile maps. In: *AIP Conference Proceedings* (Vol. 1761, No. 1, p. 020051). AIP Publishing LLC. (2016)
20. Chirchir, L.K., Aruasa, W.K., Chebon, S.K.: Perceived usefulness and ease of use as mediators of the effect of health information systems on user’s performance. *Europ. J. Comput. Sci. Inform. Technol.* **7**(1), 22–37 (2019)
21. Yan, D.W., Zhang, X.Y., Su, Q.: The willingness to use mobile libraries in colleges: cognitive lock-in. In: *5th Annual International Conference on Management, Economics and Social Development*. Atlantis Press (2019)
22. Tarhini, A., Hone, K., Liu, X., Tarhini, T.: Examining the moderating effect of individual-level cultural values on users’ acceptance of E-learning in developing countries: a structural equation modeling of an extended technology acceptance model. *Interact. Learn. Environ.* **25**(3), 306–328 (2017)
23. Lee, S.G., Trimi, S., Kim, C.: The impact of cultural differences on technology adoption. *J. World Bus.* **48**(1), 20–29 (2013)
24. Al-Jumeily, D., Hussain, A.: The impact of cultural factors on technology acceptance: a technology acceptance model across eastern and western cultures. *Int. J. Enhanced Res. Educ. Develop.* **2**(4), 37–62 (2014)

25. US Census Bureau. Close to Half of New Immigrants Report High English-Speaking Ability. <https://www.census.gov/newsroom/press-releases/2014/cb14-105.html> Accessed 20 Mar 2020
26. Hill, L.: English Proficiency of Immigrants. <https://www.ppic.org/publication/english-proficiency-of-immigrants/> Accessed 20 Mar 2020
27. Tse, L.: Why don't they learn English? Separating fact from fallacy in the US language debate. Teachers College Press, New York (2001)
28. Moerer-Urdahl, T., Creswell, J.W.: Using transcendental phenomenology to explore the "ripple effect" in a leadership mentoring program. *Int J Qual Methods* **3**(2), 19–35 (2004)
29. Moustakas, C.: Phenomenological research methods. Thousand Oaks, CA: SAGE (1994)
30. Merriam, S. B.: Case study research in education: A qualitative approach. Jossey-Bass (1988)
31. Glesne, C.: Becoming qualitative researchers: An introduction, 3rd edn. Pearson Education, Inc, Boston, MA (2006)
32. Palinkas, L.A., Horwitz, S.M., Green, C.A., Wisdom, J.P., Duan, N., Hoagwood, K.E.: Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. *Adm. Policy Mental Health Mental Health Serv. Res.* **42**, 533–544 (2013)
33. Dukes, S.: Phenomenological methodology in the human sciences. *J. Relig. Health* **23**, 197–203 (1984)
34. O'Reilly, M., Parker, N.: 'Unsatisfactory saturation': a critical exploration of the notion of saturated sample sizes in qualitative research. *Qual. Res.* **13**, 190–197 (2012)
35. Bandura, A.: Swimming against the mainstream: the early years from chilly tributary to transformative mainstream. *Behav. Res. Ther.* **42**, 613–630 (2004)
36. Grzegorzczak, M.: The role of culture-moderated social capital in technology transfer—insights from Asia and America. *Technol. Forecast. Soc. Chang.* **143**, 132–141 (2019)
37. Winschiers-Theophilus, H.: "The art of cross-cultural design for usability, .", Universal Access in Human-Computer Interaction. Addressing Diversity: 5th International Conference, UAHCI 2009, Held as Part of HCI International 2009, San Diego, CA, USA, July 19–24: Proceedings, Part I 5, p. 2009. Springer, Berlin Heidelberg (2009)
38. Bourges-Waldegg, P., Stephen, S.: Meaning, the central issue in cross-cultural HCI design. *Interact. Comput.* **9**(3), 287–309 (1998)
39. Putnam, D.: Social capital and public affairs. *Bull. Am. Acad. Arts Sci.* **47** 5–19 (1994)