



IJIRCCCE

e-ISSN: 2320-9801 | p-ISSN: 2320-9798



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

Volume 12, Issue 12, December 2024

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 8.625



9940 572 462



6381 907 438



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www.ijircce.com



Digital Mentoring: Relationships between Mentors and Mentees in Virtual Environments

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ABSTRACT: The aim of the study is to further explore the experiences, challenges, and result of digital mentorship. 25 individuals who engaged in mentor-mentee interactions in the virtual environment were interviewed in semi-structured qualitative interviews in which data was obtained. Thematic analysis was conducted, and key themes and categories were identified from the interview transcripts, specifically focusing on mentoring: communication strategies, challenges, responses, professional and personal development, and contributions of technology and tools.

Using thematic analysis, it was possible to group the relevant information into five key domains: technology and tools, personal development, professional development, means of communication, and problems and solutions. In each of the broad categories discussed, certain issues and ideas arise: the advantages and disadvantages of synchronous and asynchronous communication; technical problems; cultural differences; networking; skills development; balance between work and social life; self-esteem; and communication tools and collaborative platforms. These findings indicate a wide range of possibilities and experiences of digital mentoring, as well as the ways in which the participants addressed the challenges posed by online environments. There appear to be many personalities at play in a digital mentorship world. They provide mentor-mentee relationships with innumerable advantages and hurdles. To make the best out of online mentorships, both mentor and mentee have to invest in a caring, personal connection before being put through their paces using technology or other effective means of communication.

This paper will hence advance our understanding of the dynamics of digital mentorship through suggestions for enhancing mentorship processes and outcomes in the digitized era. Colleges seldom provide the required support for students to enter the real workforce due to poor career guidance and training. Career information is disseminated by some through offices, consultation centers, or internships. The greatest difficulty is in delivering such information without a formal association with particular students. Hence, graduates often do not meet industry expectations, creating the urgent need for effective and organized career guidance within institutions.

KEYWORDS: Virtual communication, electronic mentoring, professional and personal development, virtual and digital mentoring.

I. INTRODUCTION

There is now a shifting paradigm away from traditional mentoring in favor of an active, evolving practice in educational and career development since the Covid-19 pandemic. Mentoring, for quite a while seen by many as fundamentally important for personal growth and professional development, has crossed boundaries, providing a trail to the cyber world. This transition onto digital platforms for mentorship-encouraged by technological advances and global health concerns-redefined traditional mentor-mentee relationships, emerging as an increasing fodder for scholarly efforts. investigation into its effects on academic and professional trajectories [13].

Mentoring has been variously defined to mean the relationship between a knowledgeable mentor and a less knowledgeable mentee set to benefit from each other in the fields of health, education, psychology, and others. Mentoring aims to build mutual respect through the process of learning and growth, having a good number of core



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values, knowledge, and skills common between mentor and mentee. However, rapidly rising technology interchange and immediacy of electronic connection within mentoring environment has clearly shown how extensively the digital tools work towards transforming the relationship between mentors and mentees [3]. The growth of social media and online mentoring platforms witness the transformation of these emerging relationships within the digital context and hence in divergence from traditional face-to-face narratives [14].

These changes are derived mainly from graduate education, and no one questions maximization of a digital mentorship as a necessity [9]. This also carried with it contributory modes of communication to maximize the mentor-mentee relationship, thus allowing for scheduled online blank sessions, peer-interactive videoconferencing, and formative assessments [1]. Peer mentorship programs are very much close to that, and they have gained ground in their promises of enhancing better academic outcomes and in building networks of support among students [16].

Various mentorship programs have also emerged outside basic education in specific ways that extend into healthcare, where their adoption has been instrumental in sustaining improved care for patients with various conditions ranging from eating disorders to dementia. Their success and sustainability have been contingent on solid supporting infrastructures with manageable funding, clear guidelines, and ongoing support for mentor-mentee pairings [19]. Additionally, mentorship has become central to enhancing diversity, equity, and inclusion in specialized professions like obstetrics and radiology, emphasizing its role in creating a diverse and inclusive workplace [5].

The modification of mentoring models to meet online platforms will herald a new phase of engagement, enabling learners from different backgrounds to be brought into closer proximity. Researchers support that successful mentor relationship has been associated with benefits such as increased academic satisfaction, increased retention rates, and positive career advancements. It should be noted that mentorship programs have also played a role in eradicating discrimination against women, increasing diversity, and training people from different areas in talent development.

While hybrid and face-to-face mentorship has been the best experience for mentees, the emotional effects and challenges reported during the transition to their new mentorship programs nearly 100 percent from home have not been positive. Studies underline how the transition between hybrid mentorship and face-to-face has become problematic and, therefore, yielded less positive outcomes for virtual mentorship participants, given the multitude of hindrances and challenges that they have had to overcome in transitioning to their new mentorship programs.

II. METHODS AND MATERIALS

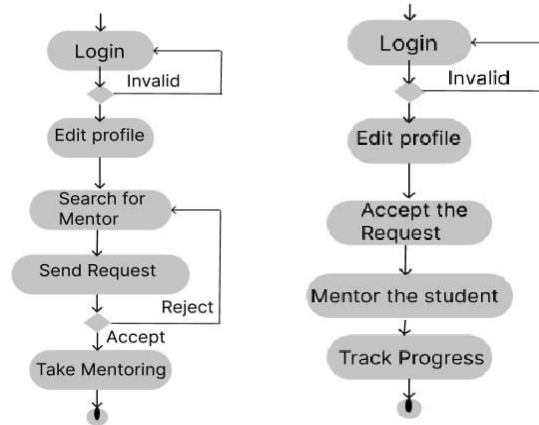
2.1. Design

This qualitative study sought to explore the nature of interactions between mentors and mentees in the online arena. Such relationships are complex and multifaceted; therefore, a qualitative approach is privileged in exploring both the breadth and depth that characterize participants' experiences. The study used semi-structured interviews in which respondents were permitted to express, apart from established points of interest, comments consistent with the queries of the interview. Participants were solicited through both purposive and snowball sampling methods to create a cohort and diversity in age, occupation, and experience concerning digital mentoring. Applicants should have been involved in online mentoring for at least three months as either a mentor or a mentee.



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The extent of gainful respect offered to the participants enabled sufficient time for deep reflections on these relationships. Every effort was made to achieve even representation of gender, location, and discipline, thereby paving the way for an overview of the experiences of the very realms of digital mentoring.

Before the interviews began, participants were given an information sheet detailing the study rationale, the voluntary choice regarding participation, confidentiality, and anonymity assurances. The verbal consent therein was secured, thereby allowing recording, verbatim transcription, and later anonymization of interviews.

Included in these ethical considerations are the necessity of informed consent from participants, the maintenance of confidentiality and anonymity among participants, and allowing the participants to withdraw from the study at any stage without challenge or consequence.

2.2 Data Collection

Only online semi-structured interviews were done for the data collection process. All interviews were between 45 and 60 minutes in duration in order to reflect the digital nature of the mentoring relationships uniquely in which each interview was conducted. Interviewing was done via Meeting video conferencing with an interview guide that covered such aspects as the beginnings of their relationship, communication styles, challenges between them, and what each one sees as the outcomes of the mentorship.

Clarification on interesting points was pursued through an open-ended question approach. Some interview questions included: What prompted you to become a digital mentor? Can you provide a description of what a typical conversation with either your mentee or mentor looks like? What were some of the challenges of maintaining an online relationship? What ways has online mentoring contributed to your personal or professional development?

2.3 Data Analysis

The transcripts were thematically analyzed to identify patterns and issues pertaining to digital mentorship experiences. The analytic procedure was divided into six distinct phases: getting acquainted with the data, generating initial codes, identifying themes, reviewing the themes, defining and naming the themes, and writing up the report. Both deductive and inductive approaches were applied, allowing new insights to emerge from the data as decorated by the literature surrounding mentorship and the digital context. These processes assisted in data management and coding in the NVivo software.

Search algorithm:

Purpose: Provides a method to search potential mentors for criteria such as expertise, availability, and location.

Matching algorithm:

Purpose: Matches mentees with the best-fit mentor using preferences, expertise, and availability.

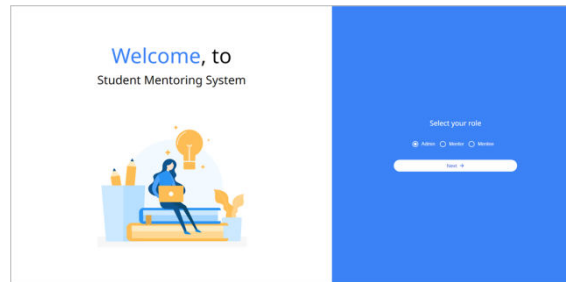


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Scheduling algorithm:

Purpose: Allows for effective scheduling of mentoring appointments whereby times that are agreeable by both mentors and mentees are accordingly matched.



III. FINDINGS

Twenty-five individuals were included in the study considered the dynamic of digital mentorship. The demographic makeup of the group represents a wide range of ages, career backgrounds, and geographic regions

Table 1
Categories, Subcategories, and Concepts

Category	Subcategory	Concepts
Communication Methods	Synchronous	Video calls, Real-time messaging, Live chat
	Asynchronous	Emails, Discussion forums, Recorded videos
Challenges and Solutions	Non-verbal	Emojis, Reaction GIFs, Screen sharing
	Technical Issues	Connectivity problems, Software glitches, Hardware limitations
	Cultural Differences	Language barriers, Social etiquette, Norms and values
	Time Zone Management	Scheduling, Overlaps, Flexibility
Professional Development	Privacy Concerns	Data security, Anonymity, Consent
	Skill Acquisition	Technical skills, Industry knowledge, Certifications
	Networking	Professional contacts, Industry events, Social media
Personal Development	Feedback Mechanisms	Constructive criticism, Performance reviews, Peer feedback
	Confidence Building	Self-esteem, Self-efficacy, Motivation
	Work-Life Balance	Setting boundaries, Time management, Stress reduction
Technology and Tools	Personal Goals	Achieving milestones, Personal branding, Goal setting
	Collaboration Platforms	Slack, Microsoft Teams, Google Workspace
	Communication Tools	Zoom, Skype, WhatsApp
	Project Management Tools	Trello, Asana, Monday.com

Of the participants, eight belonged to the 20 to 29 age group, ten were aged 30 to 39 years old, five were 40 to 49 years old, and two were 50-59 years old. The two younger inequalities virtually made a fair group. The interest of these participants was considerably diverse; ten belonged to the technology sector, five belonged to the education sector, four belonged to healthcare, and six were from business.

This qualitative analysis provided insights into the four major factors of digital mentorship: methods of communication, challenges and strategies, professional development, and personal development, along with the technologies and tools involved. An effective communication strategy was vital for creating and maintaining functional mentor-mentee relationships. Three subcategories emerged from this category: synchronous communication, such as video calls, instant messaging, and live chat; asynchronous communication, such as emails, discussion forums, and recorded video sessions; and nonverbal communication styles, such as the use of emojis, reaction GIFs, and screen sharing. A mentor said, "Using emojis and GIFs helps break the ice and convey feelings that are hard to express through text alone".

Among the unthinkable challenges posed for digital mentors and mentees were such technical issues as mentors and mentees dealing with "connectivity issues, software glitches, and hardware limitations". The cultural differences were also other kinks in the order brought by the inconvenience of cross-cultural mentoring: "language barriers, social etiquette, norms, and values".

Another big problem was time zone management: schedule within a time zone, overlaps from modalities, and flexibility within the mentor-mentee relationship. Digital mentoring's main attraction was opening the door to professional development. The skills might be enhanced through their technical knowledge, industry understanding, and certifications. As stated by one mentor, "Digital platforms opened up new professional contacts and drove industry events I wouldn't have otherwise accessed"; networking opportunities were increased. Feedback mechanisms-"constructive criticism, performance appraisal, and peer feedback"-are entirely essential for development.



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Considerable effects were also made in terms of personal development. "My mentor boosted my confidence to handle new challenges," as reported by one mentee. Confidence building can often involve self-esteem, self-efficacy, and motivation. Work-life balance was changed through "setting boundaries, time management, and the reduction of stress." At the mentorship level, personal goals, including milestones, personal branding, and goal setting, were aggressively pursued.

In every dimension, technology and tools played a significant role. The critical position of project management tools, such as Trello, Asana, and Monday.com, was emphasized, as well as communication tools such as Zoom, Skype, and WhatsApp and collaboration platforms such as Slack, Microsoft Teams, and Google Workspace.

The benefits include:

1. This platform has an easy mechanism to share communication between students and mentors.
2. The very traditional model is sluggish and often ineffective; hence, it provides better time use.
3. It shatters boundaries between students and mentors which will result in skepticism and improvement in the levels of knowledge of the students.
4. Online tasks assigned by mentors over the internet.

IV. DISCUSSION AND CONCLUSION

The research provided a good account of the bases, nature, and style of mentorship relationships in digital settings by various applications and experiences refining the mentoring process. The results summarized above include that digital mentorship was related into three major areas of activity; synchronous, asynchronous, and social media-based interaction; further highlighting a broad range of communication methods used. Other observations included: strong emphasis on how mentoring techniques work best, growing demand for online mentoring for both personal and professional development. Reverse mentoring was pinpointed to build information technology (IT) literacy, whereas the consideration of sensitive topics being discussed in safety over digital platforms was noted. Also emphasized in the study is the fact that fostering personal relationships within virtual mentorship is key, since online mentoring furthers diversity, equity, and inclusion.

From qualitative analyses of digital mentorship emerged five key broad themes encompassing several categories, which highlight the complexity and volume of interactions between mentors and mentees in the virtual setting. Communication Methods, Problem-solving, Professional Development, and Personal Development are some of the themes used, while Technology and Tools stand out as the major broad themes. The categories of those themes are as follows: Communication Methods (Synchronous and Asynchronous Communication); Challenges and Solutions (Technical Issues, Cultural Differences, and Privacy Concerns); Professional Development (Skill Acquisition, Networking Mechanisms, and Feedback Mechanisms); Personal Development (Confidence Building, Stress Management, and Personal Goals); and Technology and Tools (tmptmction Tools, Communication Tools, and Project Management Tools).

The section on Communication Methods focused on effective communication as a key differentiator for digital mentoring under three main categories, namely Synchronous tools such as video calls, real-time messaging, and live chat; Asynchronous tools like emails, discussion forums, and recorded videos; and Nonverbal tools that include the use of emojis and reaction GIFs, as well as screen-sharing. They provide the avenues through which the mentor and mentee interact despite the prolonged absence of face-to-face communication. Problems and Fixes theme uncovers the troubles posed by digital mentoring and means of adapting to them. Time Zone Management (timelines; scheduling; overlaps; flexibility); Cultural Differences (linguistic problems; social etiquette; conventions and values); Technical Issues (connectivity issues; software bugs; hardware restrictions); Privacy and Security (data safety; anonymity; consent). This section represents the array of challenges that digitally based platforms pose for the participants and how their solutions allowed them to respond effectively to those.

The section on professional development described the advantage of digital mentoring concerning the development of professional and career skills. This section discusses Networking (professional contacts, industry events, social media), Feedback Mechanisms (constructive criticism, performance reviews, peer feedback), and Skills Development (technical skills, industry knowledge, and certifications). The overwhelming extent to which digital mentoring can contribute to



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professional development has been emphasized; this indicates that this aspect will contribute in numerous ways toward advancing professional ability.

The technology and tools theme was broken into categories: project management tools (Trello, Asana, Monday.com); communication tools (Zoom, Skype, WhatsApp); and collaboration platforms (Slack, Microsoft Teams, Google Workspace). It discussed the value of digital tools supporting mentoring activities. It really reflects how important technology is in ensuring that the mentor-mentee relationship is maintained in a digital space.

The findings of this study demonstrate that there are complications in relationships emerging between mentees and mentors within a virtual space, overlapping with and lending credence to the literature surrounding digital mentorship across many fields. The different methods digital mentoring has passed through throughout this research conform further to the typology developed in [16] that discusses the continuum of trends in digital mentoring for language teachers as asynchronous, synchronous, and social media-led activities. Such class arrangement aids in the understanding of the multitude of possible digital mentorships and their ramifications in effective communication and learning. It has been shown that multiple studies used social cognitive theory and entrepreneurial mentorship research to study the relationships between online mentoring interventions and entrepreneurial support aimed at dissertation. Their findings underline individualized mentoring strategies as pivotal in mediating the relationship between mentors and mentees in a virtual setting, which is akin to what our research lays out the need for enhanced practice in mentorship techniques. The notion of online mentoring modalities has the potential to provide non-judgmental pathways for mentors and mentees to address concerns around health issues. This validates earlier research discussing interactions within the negotiations of discussions around stigmatized behaviors, making a case for online mentoring to nurture safe spaces for complex topics[8].

Reverse mentoring posits the same approach that internal knowledge transfer involving intergenerational relations, especially technology literacy, entails. Our emphasis on online knowledge dissemination echoes this kind of one-way knowledge sharing, in which slightly older mentors can exhibit stronger technological literacy. Both [9,10] reinforced the value of peer-support and interpersonal relationships in digital mentorship, especially in multicultural and mental health contexts.

We agree with previous research findings supporting that important aspects of mentoring, namely close interpersonal relations, remained relevant-even in a digital environment. Although there are other studies in this field, [5] and [6] show how critical digital mentorship is for underrepresented groups to advance diversity, equity, and inclusion. Our findings support this claim: digital mentorship benefits and counteracts gender bias against underrepresented people. Overall, this study provides rich contributions to the growing body of evidence on digital mentoring, capturing challenges and transformative possibilities of the relationship between mentors and mentees in virtual contexts. It highlights just how nuanced such relationships can be; how different modes of communication abide; and how vital the human touch remains-even under the aegis of digital media. It indicates that no good methods can do without stressing the complementary value of these types of mentorship.

V. LIMITATIONS AND RECOMMENDATIONS

However, there are some limitations that squash this study. Generalizability of findings would be at stake, as semi-structured interviews would not allow such generalizations, but it allows huge qualitative data, thus reducing the inferences. Different sample participants may not effectively represent any very many digital mentoring experiences across some professions and cultures. Also, the interpretations of the findings ought to be done cautiously given the equally fast-changing nature of technologies that shape digital communication tools and platforms.

Future development of human capital research will seize the opportunity to lend more significance to digital mentoring studies by harnessing quantitative measures to support qualitative interpretations and widen findings. Long-term studies investigating digital mentoring effects on career outcomes and personal development could increase understanding of its effectiveness. Furthermore, enhanced understanding of the dynamics of global mentorship could be achieved by examining the reasons for which cultural variations shape digital mentoring practices.



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Practitioners should dwell into types of digital mentoring methods and build on the specific role of customization within positive bonding between mentor and mentee.

Focusing on mentors' and mentees' digital literacy could bolster the quality of these interactions.

ACKNOWLEDGEMENT

We want to extend our heartfelt thanks to everyone who supported us during the process of conducting and completing this research paper. We author(s) express our sincere gratitude to SUREKHA K S Assistant Professor, Department of CSE, Sri Venkateshwara College of Engineering, for their invaluable guidance and support throughout the development of this paper. First and foremost, we are grateful to the authors who took part in this review paper. Their willingness to engage and share their experiences was crucial in shaping our research. Without their input, this study would not have been possible. We also owe a great deal of thanks to our academic advisors and mentors, whose guidance and insightful feedback were vital in refining our research methodology and analysis. Their expertise and encouragement played a key role in helping us navigate the complexities of this study. Special thanks go to our institution for providing the necessary resources and ethical clearance to conduct the research. The support from the administration and the review board ensured that we adhered to the highest standards of academic and ethical integrity. We would also like to recognize our peers and colleagues for their assistance, whether through technical support, discussions, or brainstorming ideas. Their collaboration enriched our understanding and perspective, and we are truly appreciative of that. Finally, we express our gratitude to the tools and software that aided our data analysis and helped bring our findings to life. This paper is the result of the collective efforts of everyone involved, and we are thankful for each contribution that made this research possible.

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