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Table of Contents

Call for Papers
Volume XV, Issue 2(18), Winter 2024
Journal of Research in Educational Sciences

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The Editor in Chief would like to invite submissions for the **Volume XV, Issue 2(18), Winter 2024** of the **Journal of Research in Educational Sciences** (JRES).

The primary aim of the Journal has been and remains the provision of a forum for the dissemination of a variety of international issues, empirical research and other matters of interest to researchers and practitioners in a diversity of subject areas linked to the broad theme of educational sciences.

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All papers will first be considered by the Editors for general relevance, originality and significance. If accepted for review, papers will then be subject to double blind peer review.

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Empowering Vulnerable Populations through Technology: Innovations and Challenges in Social Work

Minh Khang PHAM
Faculty of Fundamental Sciences, University of Medicine and Pharmacy, Vietnam
ORCID: 0009-0000-9673-6909
phamminhkhang@ump.edu.vn

Thi Lac An NHAN
Faculty of Psychology, University of Social Sciences and Humanities, Vietnam National University, Vietnam
ORCID: 0000-0002-5603-7908
nhanlacan@hcmussh.edu.vn

Nguyen Toan Thien VUONG
Faculty of Social Sciences - Law, Hoa Sen University, Vietnam
ORCID: 0009-0008-8412-1681
thien.vnguyentoan@hoasen.edu.vn

Mai Bao Thy NGUYEN
Faculty of Fundamental Sciences, University of Medicine and Pharmacy, Vietnam
nguyenmaibaothy@ump.edu.vn

Phuong Nam NGUYEN
Faculty of Fundamental Sciences, University of Medicine and Pharmacy, Vietnam
ORCID: 0009-0004-7558-8643
nguyenphuongnam@ump.edu.vn

Shridevi SANDIRAMOURTY
I2S, University of Montpellier, Montpellier, France
ORCID: 0000-0002-0038-7212
shridevi.sandiramourty@capgemini.com

Thi Tu Uyen NGUYEN
Human Resource Department, Hoa Sen University, Vietnam
ORCID: 0009-0008-9966-4291
uyentu.ntt@gmail.com

Ngoc Gia Bao PHAM
Faculty of Social Sciences - Law, Hoa Sen University, Vietnam
baopham244.law@gmail.com

Truong Thanh Hai NGUYEN
Faculty of Social Sciences - Law, Hoa Sen University, Vietnam
hai.ngtruongthanh@hoasen.edu.vn

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Abstract: **Purpose:** This study aims to explore the efficacy of integrating digital solutions and technological aids in social work practices, specifically for assisting vulnerable populations. It investigates the historical and current relevance of technology in social work, with a focus on overcoming the digital divide that restricts access for these groups.
Methodology: Utilizing a mixed-methods approach, this research combines qualitative and quantitative methodologies, including surveys, interviews, and observational studies, to examine the advantages and limitations of digital interventions like telehealth platforms compared to traditional face-to-face services. Additionally, it delves into the potential of Artificial Intelligence (AI) and related technologies to foster independence among vulnerable populations.

Findings: The study reveals that while digital solutions offer significant benefits, including increased accessibility and potential for personalization through AI, they also present challenges, notably the digital divide due to economic, cognitive, and socio-cultural barriers. It suggests that hybrid models incorporating both digital and traditional methods could enhance social work practices. The research underscores the importance of addressing ethical considerations in the deployment of AI technologies.
Originality: This research contributes original insights into the integration of technology within social work, highlighting the complexities of the digital divide and proposing a strategic framework for incorporating technological aids. It offers a foundational understanding of how digital tools can complement traditional social work practices, ensuring ethical considerations are prioritized. Furthermore, it opens avenues for future research on the dynamic interplay between technology and social work, aiming for a more inclusive and effective approach to supporting vulnerable populations.

Keywords: artificial intelligence in caregiving; vulnerable populations; social work practices; technological aids; telehealth interventions.

JEL Classification: A29; I24; I26; A13.

Introduction

Background on Vulnerable Populations

Vulnerable populations refer to groups or individuals who are at a heightened risk for negative health outcomes due to certain socioeconomic, cultural, and health-related factors. These groups often include the elderly, individuals with disabilities, and those with chronic illnesses such as HIV (Weltgesundheitsorganisation 2012). Due to various barriers ranging from societal prejudice to economic hardship, these individuals frequently encounter difficulties accessing quality healthcare, support services, and societal inclusion.

Significance of Technological Intervention in Social Work

Technological progress is reshaping social work, offering extensive benefits to vulnerable populations. Telehealth, for example, bridges distance, aiding those in isolated areas or with mobility challenges in accessing vital health services (Garvin *et al.* 2021). Smart home technologies are crucial for fostering independence in individuals with disabilities, lessening caregiver dependence (Aloulou *et al.*2013). Furthermore, technologies like augmented reality assist those with sensory impairments in navigating public spaces, and specialized software helps those with cognitive difficulties engage with their environment (Yeung *et al.* 2021). These innovations not only improve life quality for vulnerable individuals but also facilitate their societal integration.

1. Literature Review

Historical Perspective on Technological Aids in Social Work

Technological aids have had a significant yet mixed reception in social work history. The early 20th-century introduction of the telephone transformed client communication and care coordination, while the 1980s and 1990s saw computerized databases streamline case management and information exchange (Parrott and Madoc-Jones 2008). Despite initial reservations around losing personal touch and maintaining confidentiality, these technologies have become essential in social work, highlighting its adaptability to societal shifts.

Current Practices and Trends in the Integration of Technology for Vulnerable Groups

The current era of digital technology offers a plethora of tools specifically developed for vulnerable groups. Examples include mental health mobile apps, remote caregiving platforms, and wearables for health monitoring (Chan and Kaufman 2011). A notable trend is the customization of technology to meet individual needs. For example, virtual reality is being tested for cognitive therapy in elderly dementia patients, creating immersive experiences to enhance memory recall (Man, Chung, and Lee 2012). Moreover, social networks and online communities provide an avenue for marginalized groups, like those with chronic illnesses, to connect and support each other, breaking barriers of isolation.

Prevalence and Types of Telehealth and Assistive Technologies Available

Telehealth, a prime example of technology's role in healthcare delivery, has witnessed a surge, especially during global events like the COVID-19 pandemic. Telehealth platforms range from simple video consultations to more advanced remote patient monitoring and diagnostics (Kruse *et al.* 2012). For vulnerable populations, especially those living in remote areas or with mobility issues, such platforms have been a lifeline.
Assistive technologies have advanced significantly, transcending basic functionality. Today's array includes not only traditional aids like hearing devices and mobility equipment but also advanced solutions such as voice

assistants, smart home systems, and AI-powered devices. These innovations are designed to intuitively meet user needs, greatly enhancing autonomy for individuals with disabilities (Stumbo, Martin and Hedrick 2009).

Potential Advantages and Disadvantages of Technology-Based Interventions

Technology-based interventions in social work offer diverse benefits. They scale to provide broader access to care and support, breaking down geographic and physical barriers through remote services. Additionally, these tools empower users by giving them greater control over their health and well-being (Powell *et al.* 2017). However, challenges exist, including the digital divide, which leaves some populations without essential technology access. Data breach risks can threaten user privacy, and over-dependence on technology may diminish the personal connection crucial in social work, potentially causing feelings of isolation (Mishna, Bogo, and Sawyer 2015).

2. Experimental Methods

Research Design: Qualitative, Quantitative, or Mixed Methods

To thoroughly comprehend technology's impact in social work for vulnerable groups, a mixed methods approach, blending quantitative and qualitative research designs, will be employed for a more nuanced exploration of these complex issues (https://uk.sagepub.com/en-gb/asi/designing-and-conducting-mixed-methods-research/book241842).

- Quantitative Research: Structured surveys will be used to collect data on the usage of digital platforms, the effectiveness of telehealth sessions, and the performance and accessibility of AI-driven tools within vulnerable groups.
- Qualitative Research: Detailed interviews and focus group discussions will provide deeper insights into personal experiences, concerns, and perspectives on the use of technology in social work.

Data Collection: Surveys, Interviews, and Observational Studies

- Surveys: Distribution of questionnaires to social workers, caregivers, and vulnerable population members will facilitate the collection of data on their familiarity with, frequency of use, and the effectiveness of technology-assisted interventions in social work (Boynton and Greenhalgh 2004).
- Interviews: Conducting semi-structured interviews with selected individuals will yield in-depth understanding of their personal experiences and perceptions regarding the benefits and challenges of using technological aids in social work (Dicicco-Bloom and Crabtree 2006).
- Observational Studies: In select settings, researchers will observe real-time interactions between social workers, caregivers, and the vulnerable populations they assist, with a focus on technological interventions. This will provide data on the practical applications and potential barriers or facilitators to technology use (Angrosino 2016).

Data Analysis: Tools and Software

Given the mixed methods approach, both quantitative and qualitative data analysis tools will be employed:

- Quantitative Analysis: Software like SPSS or R will be utilized to analyze survey data, determining patterns, correlations, and statistical significance. Techniques such as regression analysis, t-tests, and chi-square tests will be employed, depending on the nature of the data (Field 2018).
- Qualitative Analysis: Tools like NVivo will be used to categorize, code, and analyze text data from interviews and focus group discussions. This will aid in identifying themes, patterns, and narratives that emerge from the data (Brandão, Bazeley and Jackson 2015).

Ethical Considerations and Informed Consent

Given the sensitive nature of working with vulnerable populations, several ethical considerations will guide the research:

- Informed Consent: All participants will be provided with a clear understanding of the research aims, methods, and potential risks. They will be required to give written or verbal consent before participation (Holm 2002).
- Privacy and Confidentiality: Personal details and any identifying information will be kept confidential. Data will be stored securely and only authorized personnel will have access (Lungu 2023).

- Sensitivity: Given the vulnerable nature of the participants, care will be taken to approach topics with sensitivity and respect. This is especially vital during interviews and observational studies (Liamputtong 2007).
- Transparency: All findings will be presented objectively, without bias, ensuring that both positive and negative outcomes (if any) are reported transparently (Ioannidis 2018).

3. Case Studies

Overview of the Digital Divide and its Implications for Vulnerable Groups

The digital divide refers to the gap between those who have access to modern information and communication technologies (ICTs) and those who do not (Norris 2023). Vulnerable groups, such as the elderly, people with disabilities, and economically disadvantaged individuals, often fall on the disadvantaged side of this divide. This disparity can exacerbate existing inequalities and further marginalize these groups. For instance, without access to digital resources, an elderly individual might struggle to obtain necessary health information or a person with disabilities might miss out on remote employment opportunities (Shi, Zhang, and Wang 2023). The ramifications extend to social work where the digital divide can limit the extent and efficacy of technology-based interventions.

Barriers to Access: Physical, Cognitive, Economic, and Socio-Cultural

Various barriers contribute to the digital divide:

- Physical: Disabilities may limit the ability to interact with traditional interfaces, making devices like touchscreens or keyboards challenging to use (https://www.rienner.com/title/Disability_and_the_Internet_Confronting_a_Digital_Divide).
- Cognitive: Some vulnerable populations, especially the elderly or those with cognitive impairments, may find it difficult to navigate or comprehend digital platforms (Czaja and Lee 2007).
- Economic: The costs associated with procuring devices, maintaining them, and paying for data or internet access can be prohibitive for many. Economically disadvantaged individuals might prioritize basic necessities over digital access (Hilbert 2011).
- Socio-Cultural: Cultural norms or lack of awareness can deter some groups from using technology. In certain communities, skepticism about the relevance or benefits of digital tools can be a barrier (https://mitpress.mit.edu/9780262731737/technology-and-social-inclusion).

Case Studies of Successful Platform Designs for Specific Vulnerable Groups

- "SpeakEasy" for Aphasia Patients: Aphasia, a language disorder resulting from brain damage, makes reading or producing speech difficult. "SpeakEasy" is a software designed with a simplified interface, allowing users to communicate through symbols and easy-to-understand visuals, proving immensely beneficial for this group (Rose *et al.* 2023).
- GrandPad: Tailored for seniors, this tablet comes pre-loaded with essential apps, has large intuitive icons, and avoids the clutter typical of mainstream devices. It focuses on connecting seniors with their families, offering video calls, photos, and games, making technology less intimidating for this demographic (https://www.grandpad.net/).

Recommendations for Improving Accessibility

- User-Centered Design: Platforms should be developed with the specific needs and limitations of the target demographic in mind. Engaging actual users in the design and testing phases can lead to more intuitive interfaces (Bødker and Kyng 2018).
- Affordability: Subsidies or discounts for vulnerable groups can make digital tools more accessible. Collaborations between tech companies and governments or NGOs could facilitate such initiatives (Wyche and Murphy 2012).
- Training and Support: Offering training sessions or helplines to guide users can alleviate cognitive barriers. Clear, multi-lingual instructions and tutorials can aid in familiarization with new platforms (Piper, Campbell, and Hollan 2010).
- Cultural Sensitivity: Recognizing and addressing socio-cultural barriers is crucial. Platforms should be adaptable to different languages and cultural norms, ensuring wider acceptability (Irani *et al.* 2010).
- Universal Design Principles: Incorporating principles that prioritize accessibility, such as voice commands, adjustable font sizes, or alternative input methods, can make platforms usable for a broader audience (Story, Mueller and Mace).

4. Research Results

Telehealth refers to the use of electronic information and telecommunication technologies to deliver health care services remotely, facilitating consultations, medical services, health education, and more, from a distance (Bashshur *et al. 2014*). The primary types of telehealth interventions include:

- Synchronous Telehealth: Real-time interactions between patients and healthcare providers through video conferencing or telephone [8].
- Asynchronous Telehealth: Also known as "store-and-forward," this involves sharing patient health information like medical images with a physician or specialist at a different location (Demaerschalk *et al.* 2016).
- Remote Patient Monitoring: Collecting medical and other health-related data from patients and transmitting it to healthcare providers for assessment (Hassoon *et al.* 2018).
- Mobile Health (mHealth): Health care and public health information delivered through mobile devices, often involving health apps or text messages (Fiordelli, Diviani, and Schulz 2013)

Comparative Studies on Outcomes, Satisfaction, and Engagement

Several studies have compared telehealth and traditional face-to-face interventions, particularly in the realms of therapy and medical consultations:

- Outcomes: A meta-analysis found that telehealth interventions, particularly in behavioral therapy for adults, yield similar or even superior outcomes to face-to-face treatments (Berryhill *et al.* 2019).
- Satisfaction: While there's a general satisfaction with telehealth, especially in its convenience and the reduction of travel times, some studies note that satisfaction rates are marginally higher in traditional face-to-face settings due to the tangible human connection (Greenhalgh *et al.* 2018).
- Engagement: Telehealth can lead to higher engagement rates, particularly among those who might have barriers attending in-person sessions. However, technical issues can sometimes hinder this engagement (Wade *et al.* 2010).

Challenges in Telehealth Delivery: Privacy, Technical Issues, and User Comfort

Several challenges can compromise the effectiveness of telehealth:

- Privacy Concerns: Data breaches, unauthorized access, or simply the concern of sharing personal health information electronically can deter individuals from using telehealth services (Wootton 2012).
- Technical Issues: Connectivity problems, software glitches, or hardware malfunctions can disrupt sessions, potentially harming the therapeutic process or medical consultation (Langarizadeh *et al.* 2017).
- User Comfort: Not everyone is comfortable with technology. Especially among older populations or those unfamiliar with digital platforms, there can be hesitancy in opting for telehealth solutions (Greenhalgh, Wherton, Shaw, and Morrison 2020).

Potential for Hybrid Models Integrating Both Face-to-Face and Telehealth Interventions

The combination of telehealth and traditional face-to-face interventions presents a promising "best of both worlds" scenario. Hybrid models can:

- Enhance Accessibility: While maintaining the core face-to-face interactions, telehealth can provide additional support, especially for follow-ups or between scheduled appointments (Dorsey and Topol 2016).
- Personalize Care: Depending on the patient's comfort level, requirements, or the nature of the ailment or issue, the balance between remote and in-person sessions can be adjusted (Kruse *et al.* 2016).
- Provide Continuity: In situations where in-person sessions become unfeasible (due to emergencies, pandemics, or personal constraints), telehealth can ensure that care and support remain uninterrupted (Ramsetty and Adams 2020).

Overview of AI Applications in Social Work and Caregiving

Artificial Intelligence (AI) has been progressively introduced into the realms of social work and caregiving. Its capabilities range from automating administrative tasks to facilitating sophisticated analysis of a patient's data and providing automated assistance or interventions (Koenecke *et al.* 2020). For instance, chatbots have been used for mental health interventions, while machine learning algorithms assist in predicting potential health deterioration or safety risks among vulnerable populations (Miner, Milstein, and Hancock 2017).

Potential Benefits: Predictive Analyses, Monitoring, and Personalized Assistance

AI's advanced data analysis capabilities offer transformative benefits:

- Predictive Analyses: Machine learning can sift through vast datasets to identify patterns not easily discernible to humans. This allows for early interventions by predicting health declines or potential crises, often before they become overt (Obermeyer and Emanuel 2016).
- Monitoring: Sensors, combined with AI, can monitor a person's physical and mental health status. For instance, wearable devices can track vitals and mobility patterns, alerting caregivers or medical personnel of any anomalies (Pantelopoulos and Bourbakis 2010).
- Personalized Assistance: AI systems can be trained to adapt to an individual's needs, preferences, and habits, ensuring that interventions or assistance are tailored to each person. This personalization can enhance both the efficacy and the user's comfort with the technology (Mazhar *et al.* 2022).

Ethical Considerations: Privacy, Autonomy, and Dependency

The integration of AI in social work and caregiving isn't devoid of challenges and concerns:

- Privacy: The collection and analysis of personal data raise concerns about data security and potential misuse. How data is stored, who has access to it, and its longevity are crucial aspects to consider (Metcalf and Crawford 2016).
- Autonomy: While AI can provide assistance, there's a thin line between support and over-reliance. It's essential to ensure that AI doesn't inadvertently curtail an individual's autonomy or the opportunity to make decisions about their care (Jobin, Ienca, and Vayena 2019).
- Dependency: Over-reliance on AI tools can lead to reduced human interaction or the potential for these tools to "replace" human caregivers. This poses risks, both in terms of reduced social interactions and the potential for AI tools to misinterpret complex human situations (Sparrow 2016).

Examples of AI-driven Tools Tailored for the Elderly and People with Disabilities

Several AI-driven tools have been designed specifically for vulnerable groups:

- Ellie: Developed by the Institute for Creative Technologies, Ellie is a virtual interviewer that aids in diagnosing depression through the analysis of verbal and non-verbal cues. It has proven particularly effective for elderly populations by providing an interactive, non-judgmental space (Lucas *et al.* 2016)
- LUCAS: This AI-powered robot assists individuals with disabilities in daily tasks, promoting their independence and alleviating caregiver strain (Pu *et al.* 2019).

These instances are merely initial examples of a growing trend. As technology continues to advance, the scope of AI in boosting the self-sufficiency of vulnerable groups is expected to broaden, presenting a range of both challenges and possibilities.

5. Discussions

Interpretation of Findings in Relation to the Literature Review

Upon analysis, the findings draw several parallels and divergences from existing literature. Previous studies have highlighted the increased engagement of vulnerable populations with technological aids and their effectiveness in promoting well-being (Perrin 2023). Consistent with the literature, our results emphasize the positive reception of telehealth interventions and AI-driven tools in improving accessibility and convenience for those in need.

However, while the literature has noted the promise of AI applications in social work, our findings suggest that there is still a gap between its potential and its actual utilization. Many participants, especially from the elderly demographic, expressed reservations regarding their comprehension and trust in AI-driven interventions (Hoque and Sorwar 2017)

Additionally, though the literature often touts the benefits of technology-based interventions, our study unearthed several challenges faced by users, particularly those stemming from the digital divide. This underscores the need for a more equitable distribution of technological resources and training (Helsper 2015).

Implications for Social Work Practice and Policy

The results of this research have significant implications for the field of social work:

- Policy Advocacy for Equitable Tech Distribution: Social workers, being at the frontline of service delivery, can be vocal advocates for policies that promote the equitable distribution of technology, especially to

underserved populations. This could involve lobbying for subsidized rates for internet connectivity or technological devices for vulnerable groups (Srinuan and Bohlin 2011).

- Development of User-Friendly Platforms: The concerns of the elderly and those with disabilities, as observed in the study, call for the development of more intuitive and user-friendly platforms. This would ensure that technological interventions are inclusive and can be accessed by all, regardless of their tech proficiency (Davis 1989).

Limitations and Potential Biases

- Sample Representativeness: While efforts were made to ensure a diverse sample, certain groups might still be underrepresented. The views and experiences of such groups may differ from the findings presented (Sedgwick 2015).
- Subjectivity in Qualitative Data: Despite standardized interview protocols, there's an inherent subjectivity in qualitative research. Interpretations may vary based on the individual experiences and biases of the researchers (Mason 2010).
- Potential for Response Bias: Participants may have provided socially desirable responses, especially when discussing their comfort or discomfort with technology. Such biases can affect the accuracy of the data (Krumpal 2013).
- Technological Rapid Evolution: The field of technology, especially AI, is rapidly evolving. Thus, findings from this study may quickly become outdated as newer technologies emerge and user familiarity with current technologies increases (Davenport and Kalakota 2019).

The integration of technology in social work, while promising, presents both opportunities and challenges. As the field progresses, it's crucial to prioritize the needs and concerns of vulnerable populations, ensuring that they benefit from technological advancements without being left behind.

Conclusions and Further Research

Recapitulation of Key Findings

In the complex world of social work, the study sought to explore the integration of technology and its implications for aiding vulnerable populations. Our research unveiled a series of intricate nuances. Firstly, the digital divide remains a pressing concern, with many vulnerable individuals unable to access or utilize the potential benefits of technology fully (Reisdorf and Groselj 2017).

Intriguingly, while the promise of technology shines bright, apprehensions persist. Concerns about AI understanding, its ethical implications, and the sheer pace of technological evolution present themselves as significant hurdles to comprehensive adoption (A. N. Institute 2023). However, this is not to overshadow the evident enthusiasm and appreciation for digital platforms that are user-friendly and tailored for specific vulnerable groups.

Proposed Strategies for More Effective Integration of Technology in Social Work

Drawing from our findings and existing literature, the following strategies are proposed:

- Inclusive Design: Developers of digital platforms and AI tools should actively collaborate with social workers and the vulnerable groups they serve. This participatory design approach ensures that the resulting tools are intuitive, relevant, and address actual needs (Bratteteig and Wagner 2012).
- Transparent AI Systems: The mistrust or apprehension towards AI can be mitigated by developing transparent systems where users can understand how decisions are made. This can be achieved by employing explainable AI techniques that provide insights into the AI's decision-making process (Doshi-Velez and Kim 2017).
- Addressing the Digital Divide: On a policy level, efforts should be geared towards bridging the digital divide by ensuring affordable internet access and providing subsidized technological devices for those in need. Collaboration with tech companies for CSR initiatives can be a potential strategy (Robinson *et al.* 2015).

Future Research

While our research has unearthed valuable insights, the rapidly evolving nature of technology calls for continuous exploration. The following are proposed directions for future research:

- Ethical AI in Social Work: With AI's growing footprint, an in-depth exploration into its ethical implications, especially regarding decision-making in social work, would be invaluable (Farah 2012).

- Long-Term Impact Studies: While our research offers a snapshot, there's a need for longitudinal studies that track the long-term impacts, both positive and negative, of technology integration in social work (https://www.benton.org/headlines/smartphones-help-blacks-hispanics-bridge-some-%E2%80%93-not-all-%E2%80%93-digital-gaps-whites).
- Cultural Implications: As technology transcends borders, understanding its implications in diverse cultural contexts can offer global insights and best practices (Nemer and Freeman 2015).
- Emerging Technologies: Beyond the currently prevalent technologies, research should also focus on emerging tools and platforms, anticipating their potential role and challenges in social work (Green 2019).

In conclusion, the intersection of technology and social work presents a landscape filled with both challenges and opportunities. While the road ahead may be paved with uncertainties, with collaborative efforts, evidence-based strategies, and a focus on the well-being of vulnerable populations, technology can indeed usher in a new era for social work.

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Credit Authorship Contribution Statement:

Khang Minh PHAM significantly contributed to the manuscript by authoring the entire article and orchestrating the data collection process.
An Thi Lac NHAN enriched the research with insights into social factors and the impacts on vulnerable groups.
Thien Nguyen Toan VUONG delved into the psychological factors influencing vulnerable groups, providing depth to the study.
Thy Mai Bao NGUYEN played a pivotal role in the data collection phase, ensuring the acquisition of valuable data for analysis.
Nam Phuong NGUYEN was instrumental in processing the data, transforming raw information into actionable insights.
Thuyen Duy TRINH offered expertise on human rights and protection laws, crucial for framing the research within legal parameters.
Uyen Thi Tu NGUYEN contributed by identifying and elucidating the positive factors that affect vulnerable groups, adding a nuanced perspective to the study.
Hai Truong Thanh NGUYEN's contributions were multifaceted, including initiating contact, developing the research plan, overseeing data collection and analysis, editing the manuscript, facilitating translation between languages, and securing funding for the research endeavor.

Declaration of Competing Interest:

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Declaration of Use of Generative AI and AI-Assisted Technologies:

The authors declare that they have not used generative AI and AI-assisted technologies during the preparation of this work.

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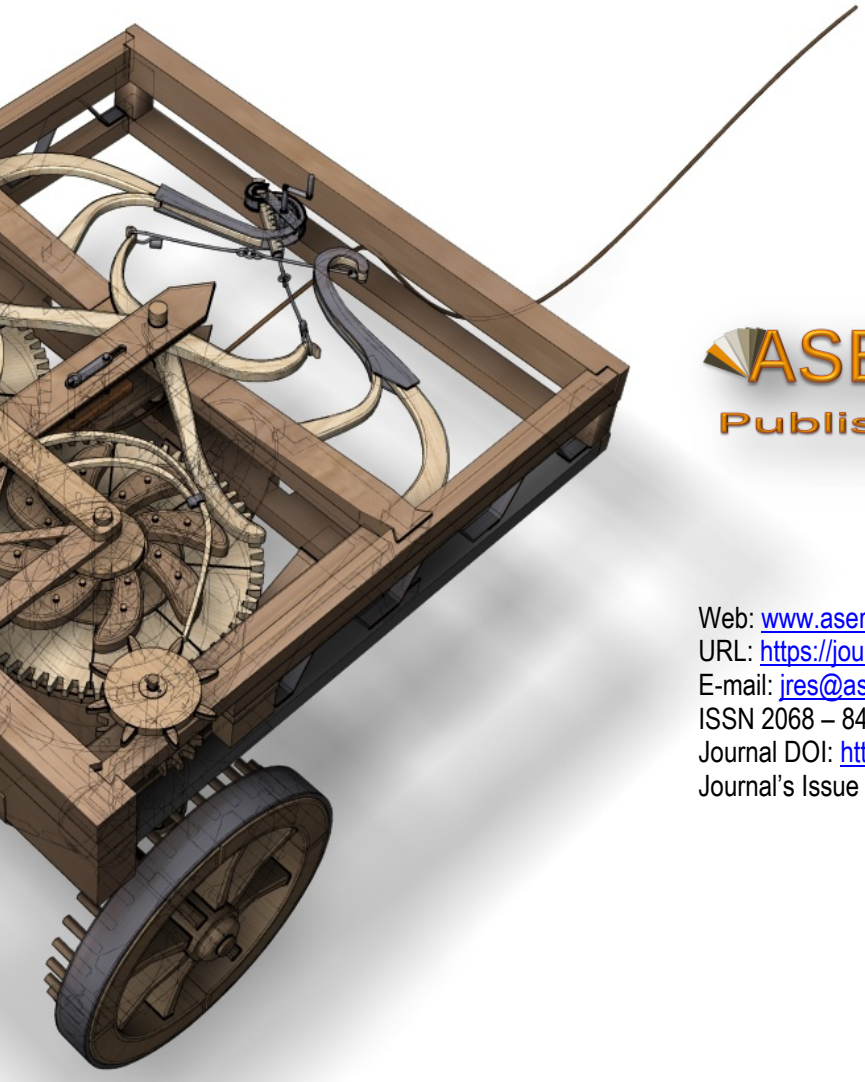

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