UNDERSTANDING GLOBAL PRACTICES ON DIGITAL DEVELOPMENT AND THE EMERGENCE OF THE GENDER DIGITAL DIVIDE WITH SPECIAL REFERENCE TO GENDER-SENSITIVE DESIGN OF TECHNOLOGY

A.R.W.M.M. Poojika Buddhinee Amarakoon*

Department of Social Studies, Open university of Sri Lanka

INTRODUCTION

Integrating the concept of gender into research studies related to humans leads to promote a rigorous and consistent scientific study that can be conducted across many disciplines (Tannenbaum et al., 2019). As a key structural principle within society, gender is articulated based on innate characteristics, socially constructed identities, norms, and relations. (Coulthard and Castleman, 2006). Digital technology is referred to as a revolutionary process that introduces simple tools to complex products and processes. It can be assumed that technology and gender are mutually constitutive fields whereas technology can be perceived in gendered ways and vice versa. In November 2014, at the 18th session of the Commission on Science and Technology for Development of the United Nations Economic and Social Council chosen the theme "Digital Development", coining the term digital development with gender, the scope expanded toward social, political, and economic sectors (UN report E/CN.16/2015/2). It has become one of the main focuses of UN sustainable development goals (SDGs) while focusing on the policy of 'leaving no one behind' (Herbert 2017). Gender and its representation in the digital world are particularly suitable for critical research whereas it is concerned with power relations and underrepresentation in the context of gender. Three components of the digital gender divide have been identified, namely: usage and retrieval of digital technologies; Skill development on the usage of digital technologies and cooperation in design and production; improving women's visible leadership, access to technology and decision-making roles in the digital sector. (Kuroda 2019)

The type and the tools that are used within the digital world have been created based on gender relations in accordance with historical, cultural, and political contexts. (EIGE 2020). Nevertheless, the design of technology is in the hands of technicians whereas several digital artefacts are created to support human activities. In accordance with recent research, explicit and implicit gender biases can be found in the design of digital services and products. (Bratteteig 2002). Mainly the issues lie in the biased nature of recognizing the user and how they might use the software; the data used to enable the software, and the architecture of the digital product might be uninteresting or impracticable based on the user's gender. (Vorvoreanu et al., 2019) Despite this, gender-related digital policies mainly fall under the category of science, technology, and innovation under the umbrella of the UN sustainable development agenda. The policies have been formed in addressing the gender-sensitive good practices that can be initiated on the area of digital development while enhancing the coherence across policies and programs under regular monitoring and evaluation. (UNCTAD 2011)

Literature Review

Gender-sensitive design of technology has been analysed in research studies focusing on the access, marketing, and usage of new technological items and virtual platforms based on men's and women's gender preferences. Most are focused on the gap in access to digital technology for women. Accordingly, Pätz (2011) depicts the importance of gender in technology design with special reference to the feminist approach, the 'female factor'. Science Technology Innovation and women's participation have become a spotlight in a considerable number of research emphasizing the importance and necessity to ensure women's access to technology as well as science and technology education. (Menya et al 2020) (UNCTAD 2011) (Hynes

and Richardson 2006). Bratteteig (2002) focuses on the designing process of technology and the biased nature of making solutions. Hazzan and Dubinsky (2006) further endorse this point, bringing out the fact that the nature of women's management style, cognitive and calculation capabilities differ from that of men in agile software development. Despite that, few studies have focused on digital technology and the non-binary and transgender groups focusing on challenges that they confront in the use and access of technological resources. Haimson et al (2020) based their research on the technology design and the availability of technological platforms specified for transgender and non-binary communities. Further, the safety of transgender women is concerned as a major factor in the research of Starks (2019). Nevertheless, in terms of global-level policymaking, the United Nations Economic council centres the economic, social, and political development around the ICT sector endorsing it via the targets of millennium development goals. (UN 2015- E/CN.16/2015/2). Accordingly, the majority of gender-based studies on digital technology focus on the binary division of gender while the main focal point lies on women's access, skills and knowledge of communication technology and its direct influence on the economy. These studies focus on the end product rather than the designing stage of it. So, there is a lacuna in analysing the digital gender divide in terms of digital development policies and the gender-sensitive design of technology.

Problem statement:

Bridging this gender divide in the digital world is a way to secure human rights and as well as it is a keystone for a prosperous modern economy. The study mainly focuses on identifying the factors that lead to forming a digital gender divide along with the lack of gender diversity in the design of digital artefacts. Accordingly, the existing global practices on digital development are considered in redressing the situation.

To that end, the **objective of the study** is as follows:

The study mainly focuses on analyzing the existing global practices on digital development considering that these practices led to the gender digital divide.It is investigated through the eye of the use and implementation of gender-sensitive design of technology. Ultimately the consequences of those practices based on the gender-sensitive design of technology and the gender digital divide are taken as implications to fortify the digital development practices. Accordingly following research tasks are taken into consideration:

- Analyze the existing global practices on digital development and related agreements reached by regional and global organizations.
- Demonstrate the subsequent emergence of the gender digital divide along with the implementation of gender-sensitive design of technology.
- Implications of the identified consequences of gender-sensitive design of technology in global digital development in bridging the gender digital divide.

The following **hypothesis** is tested to achieve the objective of the study:

Digital development practices and gender-sensitive design of technology lead to the gender digital divide.

METHODOLOGY

This study used a mixed-method analysis of both quantitative and qualitative research methods. The concepts of gender digital divide and gender-sensitive design of technology analyzed through both primary and secondary means of data collection. As for the primary data collection, an online survey has been performed. For that, a questionnaire has been created in google forms and it has been sent to the participants via email and social media. The questionnaire (containing 20 questions, with a combination of 17 structured and 3

unstructured questions) has been analyzed using the google forms tool. Here the questionnaire has mainly targeted those who have adequate IT literacy from different countries. There were 60 participants in the study who participated from several regions of the world. The concept of gender identity analyzed through scholarly articles while elaborating the related gender theories based on key takeaways of symbolic interaction theory and functionalism approaches. Also, the policies related to digital technology and its association with the digital gender divide are analyzed using the discourse analysis method. The built hypothesis was tested to derive an empirical conclusion while depicting the implications of the identified consequences of gender-sensitive design of technology in global digital development.

Limitations of the study

The study mainly confronted the conceptual challenge of integrating the considerations of gender where respondents were not willing to reveal true gender identity, especially in a circumstance of non-binary gender. Although the study targets global digital policies and the consequent availability of statistical data, this primary data collection has confronted the challenge of being unable to cover all the regions globally.

RESULTS AND DISCUSSION

This study mainly focuses on the symbolic interactionism and structural-functionalist approach to gender to conceptualize and analyse the gender digital gap and the gender-sensitive design of technology in parallel to the global digital policies. Structural functionalists consider gender as a social institution and perceive society as a complex phenomenon. Predefined gender roles and division of labour have a direct impact on the development of digital technological platforms. This fact determines the targeted client's aspirations. Herbert Blumer's Symbolic interactionism assumes of gender socialization where a person's behaviour is determined via social interactions. The human interaction with digital technology leads to the formation of global digital technological policies based on interpretations of sexual orientation, society, and culture (Gussak 2008). There is a direct relationship between the gender roles and the responsive nature of global Science technology, and innovation policies (STI) alongside the digital development policies. In the primary data collection of this research, only less than 20% of the sample knows about the other types of gender groups. So, it is visible that this factor of ignorance about various gender groups is a disadvantage for accurate data collection. 37.5% of respondents believed that there is gender specificity in the interface and content of most of the apps and software. However, Pätz (2011) insists that computer scientists rarely consider the needs of a specific gender in technological research, design, and development. This nature of the response from the sample shows that they consider the specificity of certain apps or software programs. Ex: role-playing video games and stereotypically based colour selection for the roles by each gender group. (Buchmüller & Joost 2009). In contrast, some do not perceive gender specificity in human-computer interfaces. For example, most virtual digital assistant devices or apps such as Apple's Siri and Amazon's Alexa.

However, the biological reductionist definition that women's innate skills are much lower in mathematics and technology. (Coulthard and Castleman 2006) So, with such a definition, girls' or women's access and their skills related to science and technology are at a lower scale which stems from the gender digital divide with the psychological effect of 'technophobia'. (OECD 2018). As Beckwith et al (2006) it might influence on Human-computer Interface design, based on differences in problem-solving styles, learning and information processing styles of each gender group. For example, males tend to process information in a more comprehensive style whereas females tend to do it in a linear manner. When considering these statistics respondent's opinions on the reasons led for the fewer women representation tallies with the issues of lack of digital literacy, and lack of opportunities as identified by them.

Similarly, Transgender, and other non-binary gender groups face digital exclusion due to the same factors as poverty and less digital literacy skills. (ESCAP 2019)

Moreover, when inquiring about the awareness of international and regional policies related to tech practices 66% of the respondents do not firmly believe that such policies will address the gender digital divide. The United Nations sustainable development goal on gender equality (SDG no 05) is depicted as a form of ensuring the human rights, mainly focus only on enabling access to and the use of technology-in terms of women's empowerment. It addresses the user-actor gender gap which is created in the digital design and development where it focuses on the digital contents and the operational skill development needed for genders. Data privacy law plays a major role in the digital world. According to UNCTAD (2021), 137 out of 194 countries have legalized data protection and privacy. But,no legalization has been done so far in most of the least developed countries and more than 90% of countries in the American region and in Europe have been legalized it. Thereby, considering these data it can be derived that there is a gap in the adoption and execution of digital policies and laws in different regions of the world. In terms of data protection, the use of digitalized community apps, for instance, in the usage of online dating apps and social media, data privacy is in high range. These online dating apps are highly gender-sensitive digital platforms which collect sensitive data from their users which including sexual preferences, physical location, personal interests etc. When data privacy is assured on these platforms, especially for members of the LGBTQIA+ community, then it complies with narrowing factors which cause the gender digital gap.

CONCLUSIONS/RECOMMENDATIONS

"We shape our tools and thereafter our tools shape us."- Marshall McLuhan in Culkin (1967) depicts the two-way relationship between humans and technology. Accordingly, this study is centered around digital technology in a situation where there are a plethora of digital applications and technological devices are developing related to the daily activities of human beings. Gender is closely intersected with the social world around us. Under such a circumstance the research elaborated on the concepts of the gender digital divide along with the analysis of the user's feedback on the end products of the technological artefacts (tangible and non-tangible) with the assumption that most technological products are designed in a gender-sensitive manner. The hypothesis that the Digital development practices and gender-sensitive design of technology lead to the gender digital divide has been tested empirically via an online survey and through an intensive analysis of secondary sources, it has been derived the following conclusions:

-Human-computer interfaces (HCI) tend to possess a gender specificity to some extent based on the content, purpose, and targeted group of users, while most interfaces are identified as gender neutral.

- Gender digital divide mainly concerns the labour concentration rates of men vs women in the IT industry which has a considerable impact on the designing process of digital technological artefacts. Further, the access to and the rate of usage of digital devices further creates the gender digital gap alongside the digital divide which is created in general in some regions of the world due to the lack of resources.

Added to that, it seems that though most people are aware of the digital divide- which focuses on the availability of digital resources, only a considerable amount of the global community is aware of the influence of designed outputs of the tech industry on gender. Thereby, global and regional organizations need to take necessary steps to make people aware of the policies they have formed while ensuring that gender equality is preserved through proper awareness and actions.

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