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Analysis of Disparity of Key Demographic Factors on Broadband Technology Usage among Teenagers: Gender as Prime Focus

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Authors' contributions

This work was carried out in collaboration between both authors. Author HAH managed literature search, participated in the data collection and written of first draft of the manuscript. Author IDM designed the study, supervised the data collection, performed the statistical analysis, coordinated written of first and final draft of the manuscript. Both authors read and approved the final manuscript.

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ABSTRACT

Aims: Broadband internet and broadband-enabled devices have been considered as alternative approaches to increase the productivity of teenagers in their respective schools. However, there is less or no research that establishes interference of some required factors for usage of broadband technology on the teenagers' gender. Therefore, the study presents the disparity in the usage of broadband technology among teenagers together with the interference on their gender brought by some factors.
Study Design: The research used simple random sampling approach which gave equal chances of selection to the participants.
Place and Duration of Study: This research engaged teenagers who are secondary school students in Kedah state of the northern region of Malaysia as the unit of analysis, due to their ability to provide facts on the internet related issues.

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Methodology: A comparative design approach in an experimental form is chosen to observe the extent of interference of some demographic factors on the gender of teenage users of broadband technology. Over 400 teenagers were invited to four different internet centres and 373 participants were selected from the invitees.
Results: The study showed that teenagers' educational level, living locations, family sizes and their parents' jobs are the factors to measure the disparity created by the gender of teenagers while using broadband technology. Hence, upper hands are with the teenagers who are female over the male's counterparts in terms of usage of broadband technology as brought by the highlighted factors.
Conclusion: Study on the disparity of broadband technology usage by gender could assist the broadband internet service providers to further understand the factors that foster differences in the gender of teenage users of their services. This will be further studied by focusing on the approach to bridge the created gaps between the gender of users of broadband technology among teenagers.

Keywords: Broadband technology; gender focus; broadband demographic factors; gender disparity.

1. INTRODUCTION

Education that is believed to be basis of human process which aids values and actions has been commonly viewed by the researchers as an avenue to add value and sharpen the learning attitude among students, specifically the teenagers [1]. Not only that, the internet is a technology that turns the life of people and their immediate community into a meaningful enterprise. Recent studies on the world accessibility of internet revealed that 10.9% of the African populace are internet users, presents Africa as the third highest users of internet in the globe, while Asia records 48.7% of internet usage as the highest in the world [2]. On the side of internet usage among the teenager, studies have shown that there was 100% internet-access instructional computer in the US public schools with the ratio of users who are teenagers to the internet access instructional computer at 3:1 [[3], [4]. This could result from the believe of Western countries on the impact of using internet in the academic sector as promising.

It has been argued that a successful academic curriculum should embed internet access in order to ease and assist the teenager in their learning approach [5]. In other words, accessibility of internet in the classroom does not only affect the learning in teenager, but also giving values to the tutors' proficient and skills. Among the successful factors that led to the impacted academic delivery by the teachers in Malaysia is the compulsory inclusion of minimum of one Information Technology (IT) course during teachers' training programmes. This implies that much ha been put in place to ensure that benefits of incorporating internet usage in the education of teenager is at an optimum level. On the other hand, the use of internet in learning has gone beyond the use of low or narrowband internet due to the innovation in the learning techniques. Some of the academic activities in classrooms today need to be solved through innovative approaches, such as virtual reality and augmented reality applications. Thus, there is a need to engage in the use of high speed internet, known as a broadband technology that is capable of downloading and uploading data at high speed and relieve users from many tasks.

Many studies have emphasised that the impact of broadband is viewed through innovation of Information and Communication Technology (ICT) and innovation brought by ICTs which are collaborative Research and Development (R&D) networks, such as virtual simulations, artificial intelligence and grid computing initiatives [6]. Therefore, both innovations are enabled by broadband through the invention and propagation of new applications together with the development of existing innovations [7,8]. The study of Carlaw et al. [9] argued that broadband-enabled technology which is a combination of ICTs and some innovative-based domain like Biotechnology and Nanotechnology are liable to bring up more inventions and innovations in the future. Besides that, organizations that prioritize the usage of ICTs in the course of practicing the innovation, bring larger benefits to their users and enjoy productivity gains. Thus, the impacts of broadband technology have been greatly felt as a result of intensive use of ICTs and innovative enhancement brought to the teenagers.

Moreover, researchers have suggested that the highest attention should be given to gender over the others factors that affect the use of technology among teenagers [10]. Despite the contribution and benefits of broadband

technology on the life of teenagers, specifically on their academic performance, studies have shown that there are variations in its usage which may result from the interference of some other factors on their gender. Hence, this study establishes the gender disparities in the usage of broadband technology among teenagers together with interference from some other related factors. In other words, studies have argued that prime cause of gender inequalities on the use of technology could be traced to the existence of digital divide in their educational levels, family's size, teenagers' parent's jobs and the living location of teenagers.

Furthermore, investigation on the gender differences in terms of their accessibility and usage of internet technology among teenagers revealed that higher usage is found in male group specifically in the urban areas. The previous study had indicated that there are differences in the accessibility and usage of the contents of internet among students with higher users found in males than females [11]. Therefore, it was confirmed that higher usage of technology or internet contents are common in males than females, because male's teenagers spend more time on the net irrespective of their locations. However, it has been argued that the dominance of usage of technological between male and female depends on the attitudinal changes of the teenager [11]. Meanwhile, the study of Venkatesh et al. [12] had earlier revealed that Effort Expectancy and Social Influence as factors that influence users of technology to pose higher strength in females than male users. This shows that much is still needed to be done on gender disparity vis-à-vis usage of technology among teenagers.

2. MATERIALS AND METHODS

The adapted research methodology in this study is guided by the objective of the research. Therefore, a comparative design approach in an experimental form is chosen to observe the extent of interference of some demographic factors on the gender of teenage users of broadband technology.

2.1 Population and Sample

This research engaged teenagers who are secondary school students in Kedah state of the northern region of Malaysia as the unit of analysis, due to their ability to provide facts on the internet related issues. Over 400 teenagers were invited to four different internet centres with a view of choosing 373 participants from the invitees and provide equal chances of selection to the participants. At the end of the sampling technique which was through simple random sampling, only 373 teenagers were selected for data collection.

2.2 Tools and Design Approach

The internet centres used for data gathering were equipped with computer systems that run on broadband technology services. The four internet centres comprised of 40 computer systems each and run on Windows 10 operating systems. Therefore, we ensure that all the systems have only Google chrome browser and Java Script to achieve homogenous of the systems and avoid bias in the participants' results. Besides, participants were divided into groups at four chosen internet centres due to the adaption of comparative design approach on the experimental basis. Different tasks were given to each group to perform, while the extent of gender disparity was examined among the participants. Hence, data was gathered through the survey questionnaire distributed to all the participants and filled after the expiration of the given tasks.

2.3 Data Analysis

The analysis of the collected data focused on data preparation and cross tabulation analyses. The collected data from the surveyed questionnaires was screened properly for missing values by using SPSS version 24. A comprehensive analysis of outlier check was performed so as to avoid the outcome of the analysis from rendered useless. Therefore, the gathered data was successfully screened for both error and interesting outliers and all the 373 cases passed the outliers check, thus fit to be used for subsequent analysis. Moreover, cross tabulation analysis was performed towards establishing interference of some demographic related factors on the gender of teenagers who are users of broadband technology. Hence, the research examines the influence of some demographic factors (educational levels, family's size, teenager's parent's jobs and the living location) on teenage genders who are users of broadband technology.

3. RESULTS AND DISCUSSION

The result of the cross tabulation analysis as shown in Fig. 1 depicts interference of level of

education of teenagers who are users of broadband technology on their respective gender identities.

As shown in Fig. 1, females' broadband users are the majority in the level of educations of the participants, except in lower 6 where both genders are the same in terms of participants' current educational level. This implies that female students engaged more than their male counterparts in the technical works that required broadband internet, either in their assignments or practice exercises in the classrooms.

Looking at the effect of living locations of teenage users of broadband technology during the academic session, result of the analysis as shown in Fig. 2 reveals that female students that are living under the custody of their parents or guardians are the major handler of broadband technology than male teenagers while compared with other living locations. This shows that female students that live with their parents during the academic session have more access to the fast internet than others.

In terms of the impact of size of family of the teenage gender who are users of broadband technology, Fig. 3 shows that the higher the size of the family the more the female users of the broadband technology. Besides, it depicts that a number of female users of broadband internet doubled the male users. This may be interpreted that preference is being given to the female users to obtain more resources towards acquiring broadband technology as shown in Fig. 3.

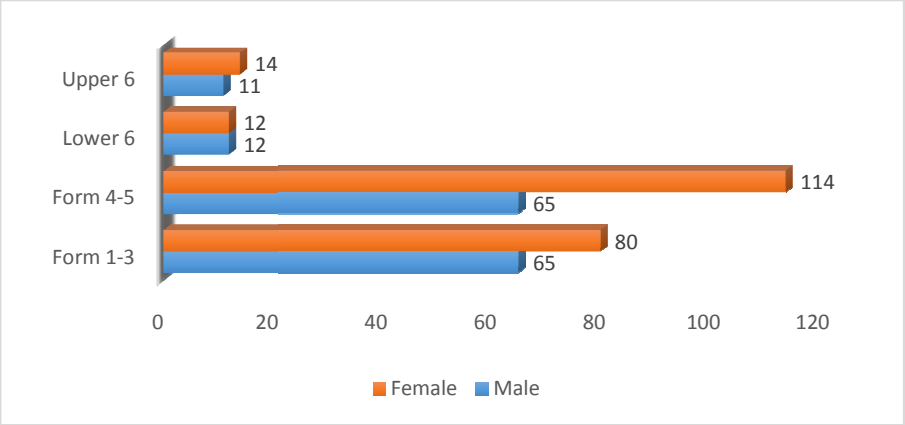

Fig. 1. Effect of educational level of teenagers' broadband users on gender

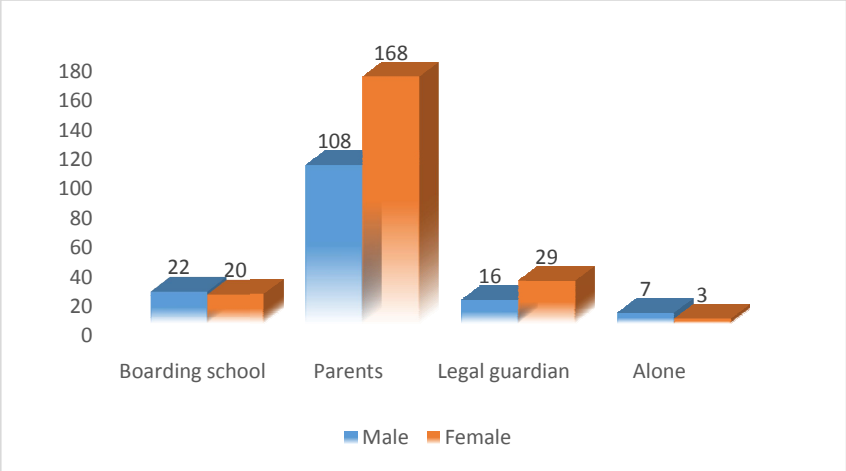

Fig. 2. Effect of living location of teenagers' broadband users on gender

Fig. 3. Effect of family size of teenagers' broadband users on gender

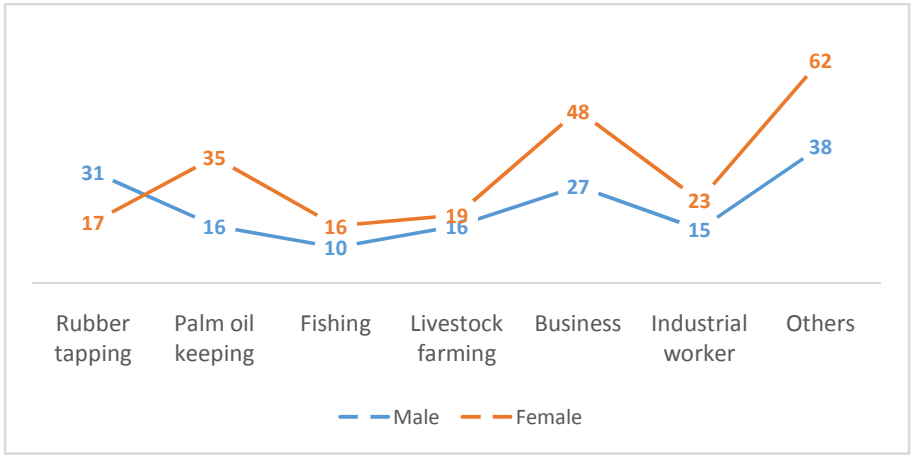

Fig. 4. Effect of parents' jobs of teenagers' broadband users on gender

Furthermore, earlier studies have shown that jobs of teenagers' parents always affect their handling of technology.

The result of the analysis shown in Fig. 4 reveals that jobs being coordinated by direct owners belong to the parents of female respondents, while only the labourer's job is owned by the male's parent. This affects male teenager's ability to acquire broadband technology and broadband-aided devices, thus favour female teenagers more than the male counterparts.

4. CONCLUSION

The analysis of disparity of some demographic factors of broadband technology on the gender of teenage users become imperative towards bridging the created gaps among the teenagers. The research considers teenagers' educational level, living locations, family sizes and their parents' jobs towards understanding the disparity created on their gender. The research used cross tabulation analysis to analyse the collected data from the teenagers who are secondary school students. Therefore, results of the analysis as shown in Figs. 1, 2, 3 and 4 revealed that upper hands are with the teenagers who are female over the male's counterparts in terms of usage of broadband technology as brought by the highlighted factors. This research will be further studied by focusing on an approach to bridge the created gaps between the gender of users of broadband technology among teenagers.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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