A Pathway to Uptake Cybersecurity Initiatives Through Intergeneration Practice in Rural Area Sustainability

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Abstract

This paper proposes a pathway towards increasing cybersecurity awareness and adoption in rural areas through intergenerational practice, with a focus on promoting sustainability. This project uses an intergenerational approach as part of a solution for cybersecurity issues in a rural community on the East Coast of Peninsular Malaysia. Rural intergeneration communities are vulnerable and unequipped with appropriate knowledge and information, and are not always empowered to deal with cyber-related threats. The rapid shift towards digitalization has increased the importance of cybersecurity, but many rural communities lack the resources and knowledge necessary to protect themselves. By fostering intergenerational connections and utilizing the knowledge and skills of both younger and older community members, we can promote the adoption of cybersecurity initiatives while also promoting sustainability practices. This study conducted a systematic analysis of the literature on social network and cyber security initiatives related to rural peoples and cybersecurity to provide crucial insights pertinent to this topic. This paper explores various strategies for implementing intergenerational practice, such as mentorship programs and collaborative projects, and provides examples of successful initiatives in other fields. Ultimately, the goal is to create a sustainable and secure digital environment that benefits both current and future generations in rural areas.

Keywords: cybersecurity, intergeneration, policy studies, rural community and social network

INTRODUCTION

Sustainability is a concern in today's society, as technology change rapidly and people need to be aware and prepare with the changes. In order to promote sustainability, this article suggests an intergenerational approach to raise cybersecurity awareness and adoption in rural areas. Rural intergeneration communities are vulnerable and unequipped with appropriate knowledge and information, and are not always empowered to deal with cyber-related threats. This is a potential weakness that can expose local communities to cyber threats. Disconnection in modern society - Being too focused on a screen makes people forget the difference between being alone and being lonely. Technology can negatively influence our social interaction, making people more socially awkward and lonely, leading to an increase in digital vulnerability. With the increase of mobile usage among the older generation, 59% of the users were above the age of 56 years (Gunleifsen, 2018), they are exposed to higher cybersecurity threats. On

the other hand, the younger generation who are technologically savvy can transfer their knowledge and support the older generation in their community. However, this is not happening due to the gap between the young and old.

Hence, intergeneration engagement can be used to empower the community to support each other in handling cybersecurity issues. In this context, the networks of social relationships of trust and mutual caring that exist in communities, known as social capital, represent certain strengths that could be utilized. Furthermore, social capital has been shown to represent meaningful community resources, so community development and community work would seem realistic options for any cyber security initiative program intervention as part of ICT development programs.

Research questions:

1. How does social network interfere in cyber security initiatives for rural intergeneration?
2. What are the social capital dimensions to address conditions of social disconnection among rural generation and to accept cyber security initiatives as a policy safeguard?

Federal governments have attempted to solve the rural intergenerational gap, which is a significant public policy concern. It has to do with differences in how people in a community use and have access to internet technology. Communication and other technologies will advance as a result of these efforts. Nevertheless, at the same time, cybersecurity emerges as a topic worth discussing, since greater access results in greater exposure to online hazards for which many rural community groups may lack awareness, education, and prevention capabilities (Huey & Ferguson, 2022).

REVIEW OF LITERATURE

Cybersecurity

Knowledge is a challenge in one domain, namely cybersecurity. Making decisions requires a thorough understanding of a lot of information in a timely manner. Many diverse parties are involved, each with its own set of standards, languages, and cultures.

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These parties originate from many groups. Most importantly, it requires a comprehensive approach and is complicated, necessitating the use of business intelligence and analytical tools and processes by the majority of firms in order to manage it. It might be a knowledge gap, a failure to share knowledge, a lack of understanding of how to do so, or a difference of opinion over the knowledge. It's possible that neither the individual nor the organisation is even aware of the issue (Susan, 2015). A commitment made under the Integrated Review strategic aim of "maintaining strategic advantage through science and technology" is the release of the National Cyber Strategy, which is based on this strategy.

Cyberspace presents a range of policy concerns that go beyond just technical ones. Since it was created by humans, the cyber world is fundamentally shaped by how people behave. Such behaviours are amplified, for better or worse, and their effects are frequently seen in the actual world. Every person's experience of cyberspace is different because it is, by definition, a "shared" space and is so large and complicated. Whether people stream a movie at home or check their bank accounts online, they are using the internet to access cyberspace (HM Government, 2022).

By establishing clear guidelines for departments and taking care of outdated Computer infrastructure, we will invest more than ever before in a quick and drastic revamp of government cyber security. By 2025, we will dramatically increase the resistance of the government's vital operations to cyberattack, and by 2030, we'll make sure that all government organisations, as well as the whole public sector, are resilient to known flaws and attack strategies (NSC, 2020). As much of the load as we can be taken off of the public, we will do more to engage and defend them.

The necessity to address these cyber-attacks and the growing cybersecurity issues facing the maritime sector. To boost industry awareness and cyber preparation, trainings and information-sharing are essential.

Social Network and Cyberspace

Social networks are online platforms that allow people to connect with others, share information, and communicate through various digital channels. These platforms have become an integral part of cyberspace, which refers to the virtual space created by computer networks and digital communication technologies. Social networks have transformed the way people interact with each other in cyberspace, enabling new forms

of communication, collaboration, and social interaction. They provide a range of features that allow users to create profiles, share content, and engage in online discussions with others (Pathan, 2021).

The rise of social networks has also brought new challenges and opportunities to cyberspace. On the one hand, social networks have enabled people to connect across geographical, cultural, and social boundaries, creating new opportunities for social interaction and knowledge sharing. On the other hand, they have also created new risks, such as cyberbullying, online harassment, and the spread of misinformation (Reddy, 2020).

Overall, social networks have had a significant impact on cyberspace, shaping the way people interact with each other online and influencing the development of digital communication technologies. As these platforms continue to evolve, it is likely that they will continue to play a major role in shaping the future of cyberspace.

Intergeneration Practice

Intergenerational practice is an approach that involves bringing people from different generations together in mutually beneficial activities and relationships. It recognizes that people of different ages can learn from and contribute to each other, and that intergenerational relationships can be a source of social connection, support, and empowerment (Singh & Bali, 2021).
Intergenerational practice can take many forms, such as:
1. **Intergenerational learning**: This involves bringing together people of different ages to learn from each other. For example, older adults can share their life experiences and knowledge with younger people, while younger people can teach older adults about new technologies and cultural trends.
2. **Intergenerational mentoring**: This involves pairing older adults with younger people to provide guidance and support. For example, older adults can mentor younger people in career development or provide emotional support and advice.
3. **Intergenerational volunteering**: This involves bringing together people of different ages to volunteer together for a common cause. For example, older adults and younger people can work together to support community projects, such as environmental conservation or building homes for the homeless.

4. **Intergenerational care**: This involves providing care and support across generations. For example, grandparents can provide childcare for their grandchildren, or older adults can receive care and support from younger family members or caregivers (GWT, 2012).

Table 1:

Four forms of Intergeneration Practice

1.	Intergeneration learning	- different ages of people learn from each other
2.	Intergeneration mentoring	- pairing older and younger people for guidance and support
3.	Intergeneration volunteering	- people of different ages get together become volunteers
4.	Intergeneration care	- providing care and support across generations

Source: Author, 2023

Overall, intergenerational practice is a way to promote social connection, combat ageism, and create meaningful relationships across generations.

Rural Sustainability

Green agenda policy is useful for sustainability agenda as part of policy sustainability. The Green policy is a commitment to environmental sustainability, technological adoption, and adaptation. In this context, the rural area is the environment to be adapted by technology or ICT for sustainability (Essays UK, 2013). This agenda is part of the green economy and the Industrial Revolution 4.0 to achieve the Sustainable Development Goals (SDG) of 2030. Thus, in this case, 'green' means that for rural people's knowledge and practises to be sustainable, they must be environmentally friendly and ecologically responsible decisions made by stakeholders (A. Aziz et al, 2018).

Rural sustainability refers to the ability of rural communities to thrive and prosper over the long term while preserving their natural and cultural resources. Sustainable rural development focuses on creating economic, social, and environmental conditions that enable rural communities to meet their needs and improve their quality of life without compromising the ability of future generations to do the same.

There are several key elements of rural sustainability, including:

1. **Economic sustainability**: This involves creating a strong and diverse local economy that supports local businesses and industries, provides employment opportunities, and generates income for residents.

2. **Environmental sustainability**: This involves preserving natural resources, reducing environmental impacts, and promoting sustainable land use practices.
3. **Social sustainability**: This involves promoting social inclusion, enhancing community well-being, and improving access to education, health care, and other essential services.
4. **Cultural sustainability**: This involves preserving and promoting local cultural traditions and heritage, including language, arts, and crafts.

To achieve rural sustainability, it is important to engage local communities, stakeholders, and decision-makers in the planning and implementation of sustainable development strategies. This can involve promoting sustainable agriculture, supporting renewable energy development, encouraging eco-tourism, and investing in infrastructure and services that support local businesses and industries.

The United Nations' Sustainable Development Goals (SDGs) depend heavily on rural development, especially when it comes to eradicating poverty (SDG 1), reaching zero hunger (SDG 2), guaranteeing access to clean water and sanitation (SDG 6), and creating sustainable communities (SDG 11). Integrated approaches that take into account social, economic, and environmental factors are necessary to achieve rural development. Some initiatives that can support sustainable rural development include building infrastructure, engaging in cooperative efforts, fostering connections between rural and urban areas, and giving rural communities access to markets, technology, and education (RELX, 2023).

In this case, sustainable development goal is a holistic approach which is required for sustainable rural development, since the technological, economical, and environmental circumstances needed to support regional economies and urban-rural links must be complemented by dependable public utilities that meet the basic needs of rural communities. Differences in development can be seen in the rural environment, which is a complex system at both the subnational and global levels. In terms of sustainable development policies and investments in infrastructure projects, decision-makers, scholars, and professionals should give rural communities equal consideration and opportunity. If nations apply policies for sustainable rural development adjacent to urban areas, Agenda 2030 may be accomplished (Mihai & Iatu, 2020).

METHODS

This study conducted a thorough review of the literature on social network and cyber security initiatives linked to rural peoples and cybersecurity in order to provide significant insights pertinent to this topic.

A thorough review of literature is essential for gaining an in-depth understanding of a topic or research question. Here are some methods for conducting a comprehensive literature review as illustrated in Figure 1:
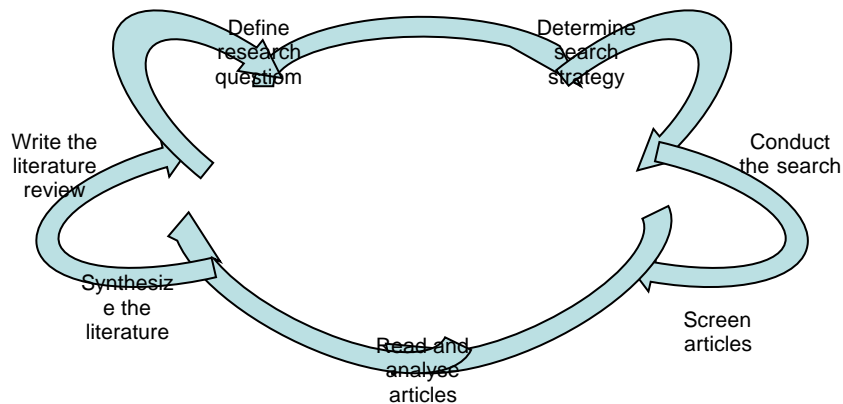

Figure 1: *Steps in conducting comprehensive literature review*

Specify the inquiry or area of study: To help with the literature review, specify the study question or subject in clear terms. Staying focused and avoiding reviewing unrelated stuff will be made easier by doing this. **Decide on a search plan**: Choose the search criteria, databases, and sources you'll employ to find pertinent material. To find all pertinent articles, use several different search phrases. **Organise the search**: Make use of the databases and the keywords you selected for the search. Keep track of the articles you find and follow a methodical approach. **Dispatch articles**: The articles that were discovered should be discarded after reading their titles and abstracts to determine whether they are pertinent to the research query or subject.

Read and evaluate articles: Read the articles that are left and evaluate their value and applicability. Make a note of the methodology, important findings, and any gaps in the literature. **Summarise the literature**: After reading and analysing the articles, synthesise the material to find recurring themes and patterns. Look identify gaps in the literature and chances for new research. **Create the literature review**: Use the notes you've taken and the synthesis you've done to compose the literature review. Make sure the literature is presented in an orderly and logical manner.

FINDINGS AND DISCUSSION

There is a growing need for cyber security in rural areas, especially as more individuals and businesses in these areas are going digital. However, there are challenges to uptake cyber security initiatives in these areas due to several factors, such as lack of awareness, inadequate resources, and limited technological infrastructure. One way to address these challenges is through intergenerational practice. This study also applies thematic analysis to broaden the analysis on the findings. The themes are as follows:

Intergenerational practice involves connecting people of different ages and generations, encouraging them to learn from each other and work together towards a common goal. This approach can be applied to cyber security in rural areas, where older individuals with more life experience can share their knowledge and skills with younger generations who are more tech-savvy.

A key finding in this regard is that intergenerational practice can help increase awareness about cyber security among different age groups in rural areas. Older individuals can share their experiences with scams, frauds, and identity thefts, while younger generations can share their knowledge of the latest cyber threats and trends. This exchange of information can help create a more informed and vigilant community that is better equipped to protect themselves from cyber-attacks.

Moreover, intergenerational practice can also address the issue of inadequate resources and limited technological infrastructure in rural areas. By working together, different generations can pool their resources and knowledge to improve their cyber security practices. For example, younger individuals can help older generations set up and use digital devices, while older individuals can teach younger generations about traditional security practices such as locking doors and windows.

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Another important finding is that intergenerational practice can help improve **sustainability** in rural areas. By promoting cyber security, individuals and businesses in rural areas can safeguard their digital assets and create a more resilient community. This can encourage more investment in these areas, which can lead to economic growth and job creation. In addition, intergenerational practice can help preserve traditional knowledge and practices that are essential for the sustainability of rural communities.

In conclusion, intergenerational practice can be an effective pathway to uptake **cyber security** initiatives in rural areas. By promoting knowledge sharing and collaboration among different generations, rural communities can improve their cyber security practices, increase awareness about cyber threats, and promote sustainability.

Studies have shown that the intergeneration project helps to develop **social capital**, which has an impact on rural community well-being in Malaysia. Rural intergeneration communities are vulnerable, ignorance and neglected; they are not always empowered to deal with cyber related threats, this is a potential weakness that can expose local communities to cyber threats. As a consequence, the influence of ICT on social capital impacts the rural community well-being. Rural local ICT initiatives will generate social capital among rural communities, encourage participation and equity, and improve well-being. Initiatives would appear to encourage community engagement, both bonding and bridging capital can be significantly affected by the adoption of ICT within the community, strengthen bonds internally and maintain networking externally with friends and relatives as well as with local authorities. The local ICT initiatives benefit the impact on social capital and improve social and economic well-being within rural communities.

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In developing social capital, **trust** is an essential factor. Without trust, people do not connect and share information about online threats and solve their online issues

themselves without appropriate knowledge. Therefore, even though government can advocate the importance of cybersecurity, when it comes to prevention of cyber threats, families and communities are the one that must be accountable for protecting their older generations.

So far, the intervention activities to engage better younger and older generations to work closely together includes.
1)   Cyber security awareness campaign among rural intergeneration
2)   Cyber behaviour & intergenerational training program
3)   Cyber security preparedness and connecting across the miles workshop

Through close collaboration with local authorities, including Malaysia Digital Economy Corporation Sdn Bhd (MDEC) and Malaysian Communications and Multimedia Commission (MCMC), the awareness campaign can help to increase uptake of the training programme. It is hoped that this can contribute towards ICT policy development in Malaysia.

CONCLUSION

This project contributes towards social outcomes in rural communities as it helps to change attitudes towards the importance of understanding cyber security. It improves the community's cyber behavior and action for both younger and older generations. The activities and program managed to foster positive intergenerational relationships between rural youth, parents, and grandparents, which helps prevent isolation and loneliness in older adults. It provides a perfect opportunity for young and old to learn from one another. It builds a stronger community. It gives older adults a sense of purpose and helps younger generations have great respect for and value for older adults. This will lead to less depression, better physical health, and higher degrees of life satisfaction leading to a better quality of life. This project also impacts the rural community through the capacity building process. The education and training program helped to improve ICT skills of the community. In addition, the program acts as a platform for intergenerational engagement, which helps increase the confidence of the community to address issues based on the increased number of participants engaging in cyber security training.

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