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Development of a creative digital curriculum for the elderly: A participatory approach to enhance potential for alternative career opportunities in the digital era

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Abstract

This research aimed to develop a curriculum for empowering the elderly to create alternative careers in the digital society era through digital platforms and to study the effects of the curriculum and online educational channels on enhancing the elderly's capabilities. Participatory Action Research (PAR) methods combined with qualitative and quantitative approaches were employed in this study. The study involved 555 participants including personnel and elderly individuals in Lampang Province that were selected by using multi-stage sampling. Descriptive statistics were used to analyze the data and compare the group mean by t-test. The research findings revealed that the "Creative Digital Retirees" curriculum for empowering the elderly to use digital technology, digital media literacy and utilizing digital media to create alternative careers met the effective criteria, the 80/80 efficiency criteria with E1 = 80.00 and E2 = 87.16. The effective curriculum consists of five learning units including Unit 1: Using technology media for the elderly, Unit 2: Understanding and digital literacy for the elderly, Unit 3: Creating social media for the elderly, Unit 4: Accessing, efficient use of technology and technology management for the elderly, and Unit 5: Electronic law. The elderly's capabilities significantly improved at a significance level of 0.05. For curriculum users' satisfaction, the result showed the highest level of satisfaction with an average score of 4.59. It is concluded that the curriculum is effective and can genuinely enhance the elderly's learning achievements.

Keywords: Career opportunities, Curriculum development, Participatory action research, Digital platforms, Elderly people, Training.

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Contents

Contribution of this Paper to the Literature

The "Creative Digital Retirees" curriculum effectively developed skills and knowledge in using digital technology, digital media literacy and utilizing digital media to create alternative careers for the elderly. Five learning units of the "Creative Digital Retirees" curriculum consist of Unit 1: Using, technology media for the elderly, Unit 2: Understanding and digital literacy for the elderly, Unit 3: Creating social media for the elderly, Unit 4: Accessing, efficient use of technology and technology management for the elderly, and Unit 5: Electronic law. Moreover, research findings highlighted significant enhancements in the elderly's capabilities.

1. Introduction

The demographic structure in Thailand is rapidly changing with a noticeable trend being the increase in the elderly population. By the year 2035, the elderly will constitute one-fifth of the total population (The Secretariat of the House of Representatives, 2015). This situation has economic, social, and health impacts such as a reduction in the workforce leading to decreased production and investment and increased healthcare costs (Chainan, 2018). A continuous increase in the number of elderly people was reported, necessitating adaptation to this scenario by focusing on the development of appropriate skills and lifelong learning to prepare the elderly for future circumstances and demands considering the situation in Lampang Province (Department of Provincial Administration, 2021). One of the adaptations to rapid changes in Thailand shows that recent statistics indicate a significant increase in social media usage (Chaihanchanchai & Anantachart, 2024). This ongoing shift to an online environment prompts the study of technology use among the elderly.

One of the emerging issues is that the use of technology by the elderly has not been sufficiently supported. Studies have found that they have a desire to work and learn computer skills. Digital technology skills are essential for the aging workforce and can be a crucial tool for generating income and new jobs in the future (Lee, Czaja, & Sharit, 2008; Torres, Bradford, & Beier, 2019). However, there is still a lack of understanding and expertise in using and creating appropriate content for digital tools. Therefore, there is a need to develop online courses for the elderly to teach digital skills and enhance readiness in using technology (Department of Provincial Administration, 2021). According to Payuha, Homrod, and Charoentansakul (2019) creating appropriate and useful online media for the elderly is important as these media can enhance relationships and knowledge sharing and can be easily used as learning materials. Hence, employing modern technology and media such as YouTube, Facebook, and e-books as communication and learning tools is essential to create relevant and beneficial knowledge. This will lead to the development of the potential and quality of life for the elderly.

Therefore, developing curricula and social media for the elderly in the digital age is crucial to driving the potential of the elderly to create alternative careers especially by enhancing digital technology skills and using social media platforms like YouTube, Facebook, and e-books. It also helps the elderly learn to create useful online content, develop communication and marketing skills through digital platforms and increase opportunities for generating income from selling products and services online. It also strengthens community relationships and improves the quality of life for the elderly in the digital society besides increasing income.

2. Research Objectives

1. To develop a curriculum for enhancing the potential of the elderly to create alternative careers in the digital society era through online educational platforms (YouTube, Facebook and e-books).

2. To study the effects of the curriculum and online educational platforms on enhancing the potential of the elderly.

3. Literature Review

3.1. The Theoretical Underpinning of E- Learning

Holmes and Gardner (2006) state that e-learning has the potential to overcome some of the limitations of traditional learning, including, most importantly, the fixed times and locations for learning. It allows for a synergy between advances in information and communication technologies and twenty-first century learning needs or skills, each giving the other a push to explore what is possible and what may ultimately be achieved. However, e-learning is still considered by many to be simply an add-on to key developments in the technology itself. It is true to some extent. The concepts comprising e- learning have emerged from several different traditions and fields, notably from education itself and psychology, computer science and sociology. There has also been a long tradition of exploring educational technology where technology is taken to include "tools" such as curriculum design, learning objectives and pedagogical techniques (Balachandran & Mahalakshmi, 2023).

Educational technology studies today are largely confined to curriculum and assessment developments and tools that enhance learning and teaching (Tamang & Rinchen, 2021). The search is on for new ways of teaching and learning that address the creation of learning environments and that support students' acquisition of the learning skills needed for the information age. Then, learning with and without technology is key. Central to this philosophy is the view that the contribution that information and communication technologies can make to learning is not an end in itself; rather it is their role in motivating and facilitating broader learning experiences that is their key contribution.

Behaviourism is perhaps the oldest and most widely understood of the three main theoretical frameworks underpinning educational and e- learning theory. Watson (1930) coined the term and he was perhaps the most extreme of the behaviourists in vehemently opposing the notion that a person's mind and consciousness could be used as a focus for explaining behaviour. In essence, classical behaviourism argues that certain stimuli will produce specific reactions in a human or animal. The classic example is Pavlov's dogs which salivated at the sound of a bell that heralded feeding time. The 'operant' version of behaviourism predicts that with sufficient repetition of an experience, specific behaviours can be taught by reinforcing the desired behaviours with appropriate stimuli.

3.2. Elderly People's Abilities and Use of Technology

Hunsaker and Hargittai (2018) have studied a review of internet use among older adults. Studies have shown that younger adults tend to access and use the internet at a higher rate. They also have better internet skills than older adults. In addition, their income and education levels are higher which is a basic indicator of social inequality among general adults. It is also something that shows differences in access to Internet usage and skills among older adults. Moreover, Hogeboom, McDermott, Perrin, Osman, and Bell-Ellison (2010) studied the use of the internet and social networks among middle-aged people and the elderly. It was found that middle-aged adults Internet use is higher than adults in the elderly the relationship between internet use and frequency of contact with friends and family of adults over 50 was positively associated. It was also found that the internet has a positive influence on community connections for users in younger age groups and the internet may help strengthen social networks and help manage stress. Relieves depression and improves health outcomes for adults aged 50 years and older as well.

Beckenhauer and Armstrong (2009) stated that older people use such media because they use it. Easier to communicate with family helps reduce feelings of distance from each other. They will likely use the internet more for social media and the ability to use it to connect friendships with friends who are far away. It can be said that technology can raise the level and open up opportunities for socialization and communication for older adults to be more aware of their social participation (Heins et al., 2021). Research has also shown that digital technologies, including the internet have the potential to improve the social participation of older adults. This is illustrated by the findings of Tyler, Simic, and De George-Walker's (2018) study of the digital experiences of retired Australians aged 65 and over. It can be seen that people in this age group are the best internet users. It is a group with experience from working. Many applications on the internet can be used as efficiently as if they were a normal part of everyday life.

A survey of the overall use of technology among the elderly found that most of them use telephones. More than 50 percent of respondents use mobile phones and computers. Using social media for calling and surfing the internet is an important activity for older adults (Gitlow, 2014). They also use it to communicate with family and friends. Conduct financial transactions online and pay for various services such as searching for information, buying things online, playing games, and using them for entertainment i.e., watching movies and listening to music, respectively (Chang, McAllister, & McCaslin, 2015). There is also a research conclusion that indicates that older people find information from Google and Facebook which are popular social media (Marston, Kroll, Fink, de Rosario, & Gschwind, 2016).

The inequality in access to digital information technology (digital divide) is the gap between groups that have access to computers, the Internet, and information on online media with another group that cannot be reached in particular, the majority of the elderly are in groups that do not have access. But at the same time, information technology has become even more necessary for the elderly. Even after retirement, such as using the internet to search for information (search engine) etc. (Miwa et al., 2017). Regarding the inequality of access to technology, Lam and Lee (2007) explained the gap between "having" or "not having" technological communication data (information communication technologies; ICTs). Today, many countries recognize the digital divide. It is considered a social problem caused by the clash between the social system and culture. With the integration of technological communication information, the elderly population is classified as one of the "nones" or technologically and socially disadvantaged groups. It can be seen that the majority of the elderly group are in the group that does not have access to information technology. I didn't grow up with technology as a child; it makes me feel like I'm not part of modern technology. Therefore, it affects their interest in studying the use of technology. Even though the content is complex, the elderly can understand digital skills if there is someone who specifically gives them advice on how to use various technologies. Explaining the various steps of using detailed and clear information is very important for promoting the learning of digital skills among the elderly in the future. At the same time, in the field of electronic equipment various applications should be developed to be suitable for the elderly (Blazic & Blazic, 2018).

Therefore, if the elderly are encouraged to use technology, it will affect technology acceptance. Miwa et al. (2017) stated that the elderly who use technology perceive that they are aware of their abilities in using computers and the internet by creating a good feeling when using the computer as for feelings of anxiety, the level has decreased. Therefore, if the elderly have the opportunity to use computers and the internet continuously, study and learn by themselves and have a group of friends to help them. Digital skills will trend and develop in a good direction at the same time; there are elderly people who believe that aging is not a depressing problem. They are more likely to think that smartphones are useful and fun. In other words, positive attitudes and different people's experiences with digital media lead to different results. Those who have basic knowledge of digital media will be easier to understand than those who do not have basic knowledge of digital media. After training, most elderly people can learn and understand until they can use the application effectively including enthusiasm and desire to study. It was also found that the emotion that occurred most frequently with the elderly throughout the training period was fear which refers to the fear that they will become stupid if they cannot do the same as others and the fear that their mistakes will damage their electronic devices including unfamiliarity with typing text on the keyboard and using the mouse (Lam & Lee, 2007). If the elderly are familiar with or are already accustomed to using technology, it is seen that it is not difficult and there is still a positive opinion of technology as Lam and Lee (2007) further explain from the results of the study. Elderly people are computer beginners who do not yet have confidence in their abilities. Participate in a variety of online work but after using it for a while and getting enough training. Elderly people will feel better and have more confidence because at least they can communicate with other people to share new knowledge such as being able to use computers and the internet .They also expect that they will have the skills to work online. In addition, as they develop more skills, they have more opportunities to participate in various online activities. Marston et al. (2016) studied the behavior of the elderly using technology through the iStoppFalls project in three cities: Cologne, Sydney and Valencia. It was found that the elderly use technology for more than a year; the main reasons for use are email, search engines, online purchases, etc. Google and Facebook are the most popular media. In conclusion, the deployment of technology must be done appropriately to be able to help the elderly population to benefit and develop a social promotion system, for example, using email,

phone calls or face-to-face telephone calls (video calls) over the internet all over the world in a short time. This is necessary for older people who are interested in and expect to use the internet continuously (Morrison & Barnett, 2010).

4. Research Methodology

4.1. Research Design

This research employs a Participatory Action Research (PAR) approach utilizing a mixed-methods design that incorporates both qualitative and quantitative methods. The objective is to create and develop media and online educational platforms through digital media (YouTube, Facebook and e-books) related to accessibility, usage, and the level of digital technology proficiency. This includes digital media literacy and the use of digital media to create alternative careers for the elderly in Lampang Province using a participatory process to develop media that aligns with their skills. Moreover, the implementation research process is divided into three phases:

Phase 1: Pre-Action (initial phase): Focus on knowledge creation processes.

Phase 2: Action (implementation phase): Experiment with the curriculum modern media, and new formats of knowledge dissemination.

Phase 3: Evaluation: Assess the use of the curriculum and online media.

4.2. Participants

The population of this study involves three groups:

Group 1: Related Personnel: Including research institutions, government, and private sector agencies involved in elderly development for in-depth interviews and brainstorming.

Group 2: (1) Elderly aged 60 and above in Lampang province, they are literate and own smartphones, totaling 182,858 individuals. A sample of this group will participate in the creation and development of participatory models and media. (2) Elderly aged 60 and above: providing basic information, motivations for using technology, the status of access, usage, and digital technology proficiency as well as suitable digital technology-based occupations, totaling 182,858 individuals. (3) Elderly aged 60 and above: Literate and owning smartphones, to test the curriculum and online educational media, and to evaluate their quality and satisfaction.

Group 3: Relatives or Close Associates of the Elderly: With technology expertise, serving as "Digital Buddies" to assist and support the elderly in using the digital curriculum and media.

All participants were selected by using multi-stage sampling including 555 participants in this study.

4.3. Instruments

1. Interview Forms: For personnel involved in elderly development to explore access, usage, and appropriate digital technology and online media. The content validity was conducted by using an index of item objective congruence (IOC) that was greater than .50.

2. Questionnaires: On basic information and motivations for using digital technology among the elderly. The content validity was conducted by using index of item objective congruence (IOC) that was greater than .50.

3. Pre- and Post-Tests: For the elderly to measure learning outcomes before and after using the curriculum. The Cronbach's alpha reliability coefficient was 0.91 ($\alpha = 0.91$). The difficulty index was appropriate ranging from 0.44 to 0.75 with the KR-20 by Kuder Richardson was 0.80.

4. Satisfaction Survey Forms: For the elderly participating in the activities to assess satisfaction with the curriculum and online media (YouTube, Facebook and e-books). The Cronbach's alpha reliability coefficient was 0.975 ($\alpha = 0.975$).

These instruments utilized for collecting both qualitative and quantitative data to ensure comprehensive and reliable evaluation of the development and use of digital technology among the elderly in the community.

4.4. Data Collection

1. Qualitative Data Collection: It includes gathering information from documents, journals, and research on appropriate technology use and digital literacy for the elderly; in-depth interviews with personnel involved in elderly development; brainstorming with the elderly in Lampang to develop appropriate media; and collecting data from curriculum and online media trials with pre- and post-tests to measure knowledge and skills.

2. Quantitative Data Collection: It involves gathering data from 400 literate elderly people over the age of 60 in Lampang Province using questionnaires on basic information, technology usage motivations, access status, usage, and digital technology proficiency; collecting data from the elderly participating in the curriculum and online media trials through satisfaction surveys and utilization assessments. The data collection process is conducted by coordinators who will explain the objectives and methods to the participants. If participants are unable to complete the questionnaires, data collectors will assist, ensuring confidentiality and voluntary participation.

4.5. Data Analysis

1. Qualitative Analysis: It includes textual analysis from documents, books, and related research to systematically organize and find meaning in the observed phenomena, and interpretive analysis from interviews and discussions to derive meaning and findings on the studied issues.

2. Quantitative Analysis: It uses questionnaires, interviews, and evaluations to summarize statistics such as the effectiveness of new media (YouTube, Facebook and e-books) using efficiency calculation formulas, analysis of pre- and post-tests for index of item-objective congruence (IOC), satisfaction questionnaire analysis using a 5-point Likert scale, discrimination power calculation of the tests, and reliability of the tests using the KR-20 formula.

Furthermore, the statistics for tool development and data analysis are as follows:

1. Tool Development Statistics: It includes efficiency calculations from learners' scores, IOC calculations from expert ratings, discrimination power calculation from test difficulty and discrimination indices, and the KR-20 formula for test reliability.

2. Data Analysis Statistics: It includes t-test dependent for comparing pre- and post-learning results, 5-point Likert scale for satisfaction questionnaire analysis, percentage calculation for frequency and proportion study, mean calculation for central tendency, and standard deviation (SD) for data dispersion measurement.

This research has been ethically approved under the Human Research Ethics Declaration with certificate number HE-153-2566 from the Ethics Committee for Human Research, Nakhon Ratchasima Rajabhat University, and received research funding from the National Research Council of Thailand on dated March 27, 2566 (Ref. N34A650832).

5. Results

The results are presented according to the research objectives as follows:

Objective 1: To create and develop online courses and educational channels related to access, usage, and proficiency in digital technology for the elderly.

This was achieved by using a participatory process to create and develop a curriculum that aligns with the skills and needs of the target group. This involved presenting survey results from in-depth interviews and brainstorming sessions with elderly participants to create diverse and suitable learning channels. The aim was to enhance skills and understanding of digital technology, empowering the elderly to develop themselves and create suitable careers in the digital age. The results are as follows:

Course and Online Educational Media Design with Elderly Participation: A content network chart was created outlining the necessary topics to build lessons. These topics were arranged in a sequence or as parallel learning units. Behavioral objectives for each unit were aligned with the content.

The research team and participating elderly individuals co-designed activities using the content network chart. The lesson series, named "Creative Digital for Retired Youth" aimed to develop skills and knowledge in digital technology, media literacy, and the use of digital media for alternative careers. This knowledge can be applied in daily life and work.

Lesson Content Framework Development: The researchers and elderly participants collaboratively developed the content details (script development) and storyboard (storyboard development), structuring the lessons according to the planned framework.

The lesson content consists of the following five learning units:

Unit 1: Using technology media for the elderly.

Unit 2: Understanding digital literacy for the elderly.

Unit 3: Creating social media for the elderly.

Unit 4: Accessing efficient use of technology and technology management for the elderly.

Unit 5: Electronic law for the elderly.

Content Accuracy and Completeness Verification: Three experts reviewed the accuracy and completeness of the content in the "Creative Digital for Retired Youth" lessons. The average content consistency was 0.92.

Language Usage Verification: The researchers revised the content based on expert suggestions and tested it with a sample group of three people. The average consistency for learning content and language usage was 0.95.

Pre - and Post-Lesson Test Development: The tests were designed to assess learning before and after each unit, evaluating difficulty, discrimination power, and reliability.

Content analysis was conducted to set behavioral objectives followed by creating multiple-choice questions (15 per unit, 75 total). These questions were reviewed by experts and those that were not suitable (5 per unit) were removed leaving 50 questions.

Reliability was tested with a group of 30 elderly individuals not included in the sample yielding a reliability score of 0.99.

The lesson efficiency was tested according to the 80/80 criterion with 30 elderly individuals (10 with digital skills, 10 with some digital skills and 10 with minimal digital skills). The analysis results are shown in Table 1.

Table 1. Efficiency measurement from percentage scores of pre-learning and post-learning tests (E1/E2) (n=30).

Order	Percentage score before learning	Percentage score after learning
E_1/E_2	$E_1 = 81.63$	$E_2 = 82.05$

Performance Results Based on Percentage Scores of Pre-Learning and Post-Learning Tests (E1/E2).

From the analysis of the percentage scores of pre-learning and post-learning tests (E1/E2) of a sample group of 30 participants, it was found that the efficiency of the "Creative Digital Retirement" course for the elderly met the 80/80 criterion with E1 equal to 81.63 and E2 equal to 82.05.

Evaluation by Online Educational Media Production Experts: The developed course was reviewed by three experts in online educational media production to verify the quality and accuracy of the content validity and the construct validity. The experts also assessed the appropriateness of the wording and revisions were made accordingly. After these adjustments, the course was tested for reliability using a summated rating scale to calculate Cronbach's alpha coefficient. The questionnaire was tested on a similar sample group of 30 participants. The reliability coefficient was 0.99 indicating that the tool is suitable for practical use.

Preparation of Course Content and Media in Various Formats: The course content was compiled into various formats, including video clips and other learning materials for dissemination through specified social media channels. The content was organized into documents and files for new communication channels, including

Facebook Page: "Lampang Retired Teenagers", The "Creative Digital Retirement" course consisting of five modules was posted on this Facebook page which garnered more than 1,000 likes and followers.

E-Book: Creative Digital Retirement E-book.

YouTube Channel: "Lampang Retired Teenagers".

Efficiency Testing of the Online Learning Media: The online lessons were tested with 30 elderly participants to identify any problems or obstacles encountered during the learning process. Observations and inquiries about

their learning experience revealed that the overall efficiency of the online learning media was rated highly with an average score of 4.57.

Objective 2: To study the impact of the course and online education channels in enhancing the capabilities of the elderly.

Result of Using Media and Online Education Channels through Social Media: Through experimentation with media and online education channels through social media among elderly participants involved in practical training, 25 participants from Baddie and 25 from Bunny, totaling 50 individuals, the effectiveness of educational media through new communication channels was rated at the highest level. The average score was 4.61.

Result of Evaluating the Course and Online Education Channels through social media: Evaluation of online learning courses through three channels showed that the "Creative Digital Retirement" curriculum is of high quality as shown in Tables 2 and 3.

Table 2. Comparison of pre-learning and post-learning mean scores of course participants

Learning score	n	Mean	Sd.	t	df	p-value
Pre-learning	50	28.42	1.91	-60.327	49	0.00*
Post-learning	50	43.57	1.05			

Note: *p < 0.05.

Table 3. Pre-learning, during-learning, and post-learning scores of participants in practical training, classified by digital technology skills

Digital technology skills	Pre learning	During learning	Post learning
There are 18 participants with digital technology skills.	30.11	40.39	44.22
There are 18 participants who have some experience with digital technology.	28.00	40.00	43.22
There are 14 participants with little or no digital technology skills.	26.79	39.50	43.21

The experimental group consisting of participants with digital technology skills those with some experience in digital technology and those with little or no digital technology skills showed comparable learning outcomes when using the course and studying through online social media.

This indicates that the course is effective and suitable for general elderly learners.

Table 4. Effectiveness analysis from pre-learning percentage scores and post-learning test scores E1/E2 of the practical training participant group (n=50)

Sequence	Pre-learning percentage score (%)	Post-learning percentage score (%)
E_1/E_2	$E_1 = 80.00$	$E_2 = 87.16$

It was found that the effectiveness of the "Digital Creative Aging for Seniors" curriculum met the criteria of 80/80 from the results of the effectiveness in percentage scores of pre-learning and post-learning tests E1/E2 among 50 participants using the course (see Table 4). Specifically, E1 scored 80.00 and E2 scored 87.16. Additionally, participants expressed a high level of satisfaction with the educational media through new communication channels with an average score of 4.59. The use of these media channels with seniors resulted in significant changes in their knowledge. Some participants who had little to no prior knowledge showed increased understanding after receiving training and reviewing materials. Moreover, seniors gained confidence and subsequently shared their newfound knowledge with others in their community.

6. Discussion and Conclusion

6.1. Discussion

Learning Management for Seniors: Effective preparation of data and teaching methods is crucial for senior learning. Rattanaubon and Supanjoy (2020) stated that technology was pivotal in developing basic technology skills for seniors using various modern media facilitates personalized learning to advance their existing knowledge, aligning with contemporary changes and fostering creative integration with other scientific knowledge. Tools include watching YouTube videos using social media devices, computer apps for social learning, and platforms such as Facebook, Line, and Google for communication and information searching. These skills are beneficial for seniors to learn various subjects using these technological tools continuously enhancing their proficiency to apply technology tools for the development of other fundamental skills. These tools can help seniors broaden their learning perspectives (Brink, 2017) enabling them to acquire new skills as needed throughout their lifelong learning journey. This learning approach is beneficial for learners or seniors according to their learning needs in new ways.

Technology-enhanced teaching activities and peer pairing: Collaborative learning activities involving technology and close relatives or caregivers are crucial factors enabling seniors to learn technology more quickly. In learning, management lasting no less than 80 hours, there are several beneficial activities through which seniors can learn through experiences with applications like Facebook, YouTube, TikTok, Line, and smartphones in the classroom leading to the development of technological learning skills. Simultaneously, face-to-face learning activities between senior learners and teachers serve as centers for mutual learning. This learning approach allows seniors to meet and converse with both instructors and fellow senior learners comfortably, facilitating communication through spoken conversations. Observation reveals that seniors tend to be more interested in this learning method than self-directed learning because acquiring technology skills can be challenging and complex for them. Therefore, seniors need to learn step-by-step. Initially, face-to-face learning helps them grasp basic skills easily. However, limitations were noted in the early stages of senior learning due to their lack of familiarity or expertise. Moreover, practical training workshops are effective in enhancing learning for seniors (Dondofema, Mwenje, & Musemwa, 2020; Soikeree & Purakom, 2019).

The workshops allow seniors to learn effectively through hands-on experience, aligning with the idea of using technology to strengthen learning for seniors further. Activities of this nature encourage seniors to create works using technology such as integrating art with various technologies and researching diverse information from the internet. Utilizing related devices like smartphones, tablets or computers enhances their ability to demonstrate creative skills independently. Specifically, activities like basic photography learning contribute to skill development through technology.

Educational Media from New Communication Channels: Educational media through new communication formats have emerged from collaborative efforts by research teams allowing seniors to participate, provide feedback, experiment with media effectiveness and have their quality assessed by experts. It was found that learning outcomes meet the established criteria. This educational media results from seniors' collaborative decision-making, appropriate media selection, easy and convenient usability. These educational media through all three channels help seniors learn faster and offer multiple convenient options aligning with Cain (2005) suggested that investing in educational technology was cost-effective. Using programs for development helps reduce time spent on travel, finding speakers, venues, and scheduling. Thus, the essential role of technology in enhancing learning efficiency and cost-effectiveness in development and creativity is evident.

Learning enhances Physical, Mental and Intellectual Development: Learning enables seniors to develop physically, mentally, and intellectually contributing to a healthy society and preventing dementia. It allows them to learn new things, interact with peers, engage in activities, avoid loneliness and experience happiness. Moreover, seniors have opportunities to learn for new careers or enhance existing ones with digital technology generating additional income. Tam (2012) founded that learning is crucial for active aging. Effective learning management for seniors promotes continuous self-improvement leading to a good quality of life, self-care, normal social participation, and alignment with the views of Yodpetch, Pattanasri, and Sakdaphon (2017) state that senior schools provide significant benefits. When activities occur together, negative self-perceptions are eliminated, and seniors feel valued, able to pass on their knowledge to family or others.

6.2. Conclusion

A curriculum that empowers the elderly to create alternative careers in the digital society era through digital platforms was effective. The lesson content in this effective curriculum consists of five learning units as follows: 1) Unit 1: Using technology media for the elderly, Unit 2: Understanding digital literacy for the elderly, Unit 3: Creating social media for the elderly, Unit 4: Accessing, efficient use of technology and technology management for the elderly, and Unit 5: electronic law. Moreover, the elderly's capabilities were significantly improving at a significance level of .05 and the highest level of satisfaction in the curriculum of the elderly. So, it is concluded that the curriculum is effective and can genuinely enhance the elderly's capabilities.

7. Implications

For the policy suggestions and implications, the user should be

1. Promote Collaboration among all Sectors: it is advisable to promote collaboration among all sectors, including government agencies, private entities, local communities, elderly associations, and religious institutions. Each area should designate a coordinating body which may differ from place to place to facilitate cooperation and develop comprehensive plans for elderly development in all aspects.

2. Utilize digital technology for senior learning and establish community-based and online senior learning centers to increase access to quality education equally for seniors. Digital technology should be utilized extensively to promote senior learning.

For the practical suggestions and implication, the user should be

1. Integrate education into workplace communities, schools in workplaces should integrate activities for senior learning in collaboration with other organizations. They should also prepare seniors to become high-quality individuals in the future focusing on seeking new knowledge, guest lecturers, and necessary equipment.

2. Promote Volunteer Activities: Encourage volunteer activities among seniors where volunteers help facilitate senior learning. Volunteers could include youth, students, local teachers, retired professionals, media personnel, intellectuals, and local experts who can serve as instructors in senior learning activities, sharing knowledge and experiences with seniors.

3. Promote intergenerational learning activities and encourage intergenerational learning activities, especially between grandparents and grandchildren, to share knowledge and experiences across generations, fostering mutual understanding and acceptance.

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