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Implementation of Digital-Based Adult Learning Education (ALE) at Community Learning Centre (CLC)

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ABSTRACT

This study aims to answer the challenges of globalization of information and the position of advanced technology in adult learning education that accelerates the diffusion of science and technology in the work or social life and encourages adults to adapt to the times. This research uses mixed methods, with quantitative and qualitative approaches. The research was conducted at a community education institution, namely a CLC in Indonesia, with a total response of 120 adult learners from 43 CLCs. The results of the study are: 1) CLC has provided material according to the needs of the learning community with cooperative, participatory and collaborative learning; 2) CLC has facilitated its learning citizens to discuss and provide digital exercises and quizzes; 3) CLC has provided learning materials that are tailored to the needs of learning citizens; and 4) adult learners are considered satisfied with the learning and learning facilities in CLC. Digital-based adult learning education has been implemented in CLC in Indonesia. Despite COVID-19 disruptions, digitalization has brought positive changes to adult learning. It has diversified the learning process, requiring educators to be more creative. However, around 20% of the 43 CLCs continue conventional learning. Because institutions are not yet fully ready to equip IT equipment and most adult learners prefer face-to-face This research illustrates that teaching adults requires the right learning approach or strategy; boredom does not occur in learning. However, 20% of CLCs must still be ready to digitize adult learning education.

Keywords:
Adult learning education; adult learners; digital learning; community learning centre

1. Introduction

Implementing digital-based adult learning education (ALE) At the Community Learning Centre (CLC), the application of digitalization in the adult learning process involves using digital technology to access various learning resources [1]. Adult learners are included in the immigrant generation category, which is a challenge in itself when compared with the native generation. Digital immigrants can only do one job at a time, prefer to read in hardcopy format and assume that those with much knowledge write a lot, work consistently and gradually so that it takes more time and are just starting to learn technology.

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Adult learners refer to the condition of adult learners in terms of biological, psychological and social dimensions, which can be divided into three categories: early adulthood from 16 to 20 years, middle adulthood from 20 to 40 years and late adulthood from 40 years up to 60 years [2,3]. Meanwhile, in the Adult Education Survey in the European Union, the adult population is those aged 25-64 years [4]. Adult learning education in the United States refers to Non-Traditional Adult Learners (NALs). NALs are people who are 25 years of age and over, including those who are under 25 but have characteristics that indicate adult responsibilities, such as working full time, not being able to go to college or not completing high school [5,6]. Meanwhile, in Indonesia, adult learners tend to emphasize biological characteristics rather than psychological and social characteristics.

The results of research related to adult digitalization that has been carried out by several researchers show that technology is important for adults. Although the digital divide has narrowed, those who still cannot access and use information and communication technologies are increasingly left behind [65-68]. The use of technology in adults is also used in family life, for example using it to tell stories (digital stories) [69,70], the use of digital technology devices is more widely used by women [71], the use of media by parents for children at home [72,73], which is based on individual reasons as well as adults' social and external reasons for using digital devices [71,74,75].

Given that adults are interpreted differently by different cultures, adults in the context of ALE (Adult Learning and Education) indicate all people who are involved in ALE, even including those who chronologically have not reached adulthood (in contexts such as NALs), middle-aged and old age, importantly they are involved as learners in various forms of ALE [7,8]. Thus, adults in the context of ALE are not limited by age, social role and other demographic characteristics but rather include all populations who have had the opportunity to access and engage in ALE.

Understanding the logic of generations and knowledge from different generations can make learning more effective and efficient. Given that the Digital Native generation are those born in 1995 who are currently 0-22 years old [9], the majority of adult learners in the digital era are Digital Immigrants who are currently 23-72 years old [10,11].

Digital Immigrants as subjects of adult learning education have the opposite characteristics with Digital Natives [12]. Digital Immigrants can only do one job at a time, prefer to read in hardcopy format and assume that those with much knowledge write a lot, work consistently and gradually so that it takes more time and are just starting to learn technology. On the other hand, Digital Native can do many tasks simultaneously [13], such as preferring to read from the screen, preferring multimedia over text, better understanding multimedia concepts, technology users and seeing no difference between the offline and online worlds. The specific characteristics of adults as Digital Immigrants need to be the main concern of educators and education administrators in designing diversified ALE programs and services now and in the future.

In Indonesia, the application of adult learning education is very easy to find in non-formal education/public education. Community education is education and learning based on empowerment, social justice, change, challenge, respect and collective awareness [14,15]. Community education is implemented in an educational institution called the Community Learning Centre (CLC). The beginning of the formation of CLC was at the time of the national socio-economic crisis in 1998. The presence of CLC was an answer that formal education and the school system were not enough to answer the various problems faced by the community [16,17]. This can be seen from the low level of public education, high illiteracy for adults, high unemployment rates, high poverty rates and so on.

Adult Learning Education (ALE) in non-formal education is believed to be able to contribute to national growth and development [18]. Therefore, digital-based adult learning is expected to meet

the needs of the community by empowering people more effectively and efficiently by adapting technological advances in each era [19-21].

Other studies have found that the globalization of information and advanced technology in the 2000s accelerated the diffusion of science and technology in work or social life, which encouraged adults to adapt to these advances in science and technology [22].

Digital-based adult learning education has become increasingly popular in recent years due to the advancements in technology and the changing needs of adult learners. This type of education allows learners to access courses and materials online, giving them the flexibility to learn at their own pace and in their own time [23,24].

One of the key benefits of digital-based adult learning education is the flexibility it provides. Adult learners often have busy lives, with work and family commitments that can make it difficult to attend traditional classroom-based courses. Digital-based learning allows learners to access courses and materials from anywhere with an internet connection, meaning they can fit learning around their other commitments [25]. This is particularly beneficial for learners who live in rural or remote areas and may need easy access to physical learning centres.

Another advantage of digital-based adult learning education is the ability to personalize learning experiences. Online courses often have a range of multimedia resources, such as videos, interactive quizzes and discussion forums, which can be tailored to individual learning styles. This can help learners to engage with the material more effectively and to stay motivated throughout their learning journey.

Digital-based adult learning education can also be more cost-effective than traditional classroom-based courses. Learners do not need to pay for travel or accommodation; courses are often cheaper than their face-to-face equivalents. This makes digital-based learning an attractive option for learners on a tight budget or who need access to funding for their education.

However, there are also challenges associated with digital-based adult learning education. One of the biggest challenges is the need for learners to access reliable internet and technology. These resources are necessary for learners to access course materials, complete assignments or engage in online discussions. This can be particularly problematic for learners from rural or remote areas or low-income backgrounds.

Another challenge is the potential for isolation and disconnection from other learners and instructors. Online courses can lack the social interactions of traditional classroom-based courses, which can be important for motivation and engagement. Learners may also need help to get support from instructors or peers, particularly if they are based in different time zones or have limited opportunities for synchronous communication.

Despite these challenges, several factors contribute to the success of digital-based adult learning education. One important factor is the quality of the course design and materials [26]. Courses need to be well-structured and engaging, with clear learning outcomes and assessments that are aligned with these outcomes. Multimedia resources should be used effectively and instructors should provide regular feedback and support to learners.

Another important factor is learner motivation and self-regulated learning [27]. Learners need to be self-motivated and disciplined in their learning and should be able to manage their time effectively to ensure they complete course requirements on time [28,29]. Instructors can support learner motivation by providing regular feedback and encouragement and fostering community and collaboration among learners.

The purpose of this study is to address the challenges mentioned above. The position of technology in the ALE program and technology is to facilitate the goals and objectives of the community itself. This study uses mixed methods, namely by collecting qualitative and quantitative

data. There has yet to be any research in the public education unit that shows the readiness of adult learners in the Digital Immigrant category, aged 23 to 72 years, to utilize digital facilities for learning purposes, especially after the COVID-19 pandemic, an endemic situation.

2. Literature Review

2.1 Digital Learning

Digital learning has become integral to modern education, offering flexible and accessible opportunities for learners of all ages [30]. In recent years, there has been a growing interest in applying digital-based Adult Learning Education (ALE) at Community Learning Centres (CLCs) to cater to the diverse needs of adult learners. Digital-based ALE at CLCs offers several notable benefits. First and foremost, it enhances accessibility. Adults with busy schedules, work commitments or childcare responsibilities often struggle to attend traditional classes. Digital learning allows them to conveniently access educational materials and resources conveniently, breaking down geographical and time barriers [31,32].

Moreover, digital ALE promotes flexibility [33]. Adult learners can progress at their own pace, choosing when and where they engage with educational content by Jamaludin and Sedek [1]. This self-directed learning approach fosters autonomy and encourages adults to take ownership of their education. Studies have shown that such autonomy can lead to higher levels of motivation and engagement among adult learners. CLCs can tailor courses to individual learner needs, offering a variety of resources, assessment methods and learning paths. Adaptive learning technologies can analyse learner performance and recommend appropriate content or interventions, enhancing the overall learning experience [34].

While digital-based ALE at CLCs offers numerous advantages, it has its challenges. One of the primary concerns is access to technology. Many adult learners may need access to computers or high-speed internet, hindering their ability to participate in digital courses [35]. Bridging this digital divide is crucial for ensuring equitable access to education. Another challenge is digital literacy. Some adult learners may be uncomfortable with technology or need more digital skills. CLCs must invest in digital literacy training to help learners become proficient in using digital tools for learning [36] .

Additionally, maintaining learner engagement in an online environment can be challenging. Without face-to-face interactions, instructors and learners must find creative ways to foster community and motivation. Employing interactive and collaborative online activities, discussion forums and peer support can help mitigate this challenge.

Several strategies have successfully implemented digital-based ALE at CLCs [37]. Firstly, blended learning, which combines in-person and online instruction, can address the digital divide while offering the benefits of digital learning. This approach allows learners to access resources online and receive instructor support during on-site sessions. Secondly, professional development for instructors is essential. CLC educators should receive training in digital pedagogy, online facilitation and digital tools. Competent instructors can create engaging and effective online learning experiences for adult learners. Thirdly, program design should be flexible and learner-centric.

The implementation of digital-based ALE at CLCs holds great promise for adult education. It offers benefits such as accessibility, flexibility and personalized learning [38]. However, challenges related to technology access, digital literacy and learner engagement must be addressed to ensure its success. By employing effective strategies like blended learning, professional development and learner-centric program design, CLCs can harness the potential of digital learning to transform adult education in community settings. As technology advances, digital-based ALE will be increasingly pivotal in empowering adult learners to achieve their educational and career goals.

Learning that is carried out online, in implementation, is carried out through the following stages:

i. Presentation of information.
ii. Guiding students in practice.
iii. Exercises carried out by students.
iv. Assessing student learning [76].

The information presentation or mixing phase is a fundamental phase. In learning design, it is necessary to provide learning needs for students, namely content (material), information and methods that will be applied in learning. The student guidance phase provides the learning interaction needs, ensuring students can understand the concepts, principles and procedures that will be presented. This stage includes exercises and practice or mnemonics (which will be discussed after this session). The third phase provides the activities of remembering (remembering), manipulating (manipulating) and applying new knowledge (applying new knowledge). Students must implement new skills and knowledge as a form of receiving information obtained from the material studied. The final phase is assessing student learning, by answering several questions, is learning going effectively? What should students do next? [76].

2.2 Adult Learning Education

Adult education plays a pivotal role in addressing the educational needs of individuals beyond traditional school age [39]. It encompasses many learning opportunities, from basic literacy programs to workforce development initiatives. However, in an era of rapid technological advancement, the need for digital literacy and skills has become increasingly crucial for adult learners.

The implementation of digital-based ALE at CLCs brings forth numerous benefits. Firstly, it fosters accessibility. Digital learning platforms enable adults to engage in education from anywhere, breaking down geographical barriers [40]. This is especially significant for those who cannot attend in-person classes due to work, family or other commitments. Secondly, digital ALE enhances flexibility. Adult learners can tailor their learning experiences to their schedules and preferences [41]. They can choose the pace at which they progress through materials and the time they engage with educational content. This flexibility empowers learners to take control of their educational journeys, making learning a more personalized experience.

Moreover, digital ALE promotes self-directed learning. Adult learners often have specific goals and interests and digital platforms allow them to explore relevant resources and courses [42]. This self-directed approach encourages autonomy and motivates adult learners to engage in their education actively.

While the benefits of digital-based ALE are substantial, some challenges must be addressed for successful implementation. One of the most significant challenges is access to technology. Many adult learners may need more devices or reliable internet connections to participate in digital ALE programs fully [43,44]. Bridging this digital divide is a fundamental step in ensuring equitable access to education. Additionally, digital literacy is a hurdle for some adult learners. It is essential to provide support and training in digital skills to help learners become proficient in effectively using digital tools for learning. This may involve offering introductory courses on digital literacy or providing ongoing assistance as needed.

Another challenge is maintaining learner engagement without face-to-face interactions [45]. Adult learners may struggle with motivation and isolation in online learning environments. CLCs must explore interactive and collaborative strategies to foster a sense of community and keep learners

engaged. To overcome these challenges and ensure successful implementation, several strategies have proven effective. Blended learning, which combines online and in-person instruction, can help address technology access and engagement issues. It provides opportunities for face-to-face interactions while leveraging the benefits of digital learning.

Professional development for instructors is crucial. CLC educators should receive training in digital pedagogy and online facilitation. Competent instructors can create engaging and effective online learning experiences, ensuring adult learners receive the support and guidance they need [46]. Program design should be flexible and learner-centric. CLCs should offer a variety of courses and resources to accommodate diverse learner needs and preferences. Learners should be able to select courses that align with their goals and interests.

Implementing digital-based ALE at CLCs represents a significant advancement in adult education. It offers accessibility, flexibility and self-directed learning opportunities that empower adult learners to pursue their educational goals. However, technology access, digital literacy and learner engagement challenges must be addressed proactively. By employing effective strategies such as blended learning, professional development for instructors and learner-centric program design, CLCs can harness the potential of digital learning to enhance adult education and promote lifelong learning in a world where digital skills are increasingly vital, integrating digital-based ALE at CLCs positions adult learners to thrive in the modern educational landscape.

2.3 Community Learning Centre

Community Learning Centres (CLCs) serve as essential hubs for community education and skill development [47]. In recent years, integrating digital-based Adult Learning Education (ALE) into CLC programs has emerged as a powerful tool for expanding access to education and enhancing the lifelong learning opportunities available to adults. This research essay explores the pivotal role of CLCs in implementing digital-based ALE, the transformative impact on adult learners and the challenges and strategies associated with this integration.

CLCs are community-based educational institutions that offer a wide range of programs, from basic literacy courses to workforce development initiatives [48]. They are uniquely positioned to address the educational needs of adults within their local communities. CLCs often serve as inclusive spaces that cater to diverse learner populations, including individuals with varying educational backgrounds, linguistic abilities and socio-economic statuses.

The integration of digital-based ALE at CLCs has ushered in a new era of adult education. It comes with several benefits that extend beyond traditional classroom settings. Firstly, digital ALE enhances accessibility. Adults who may have previously faced barriers to education, such as lack of transportation or inflexible schedules, can now access learning materials online, breaking down geographical and time constraints [49]. Secondly, digital ALE promotes flexibility [50]. Adult learners can tailor their learning experiences to their unique needs and schedules. They can choose when and where they engage with educational content, fostering autonomy and ownership over their learning journeys.

Furthermore, maintaining learner engagement without face-to-face interactions can be challenging. Adult learners may struggle with motivation and isolation in online learning environments. CLCs must explore interactive and collaborative strategies to foster community and ensure learners remain engaged [51]. To address these challenges and ensure the successful integration of digital-based ALE at CLCs, several strategies have proven effective. Blended learning, which combines online and in-person instruction, can mitigate technology access and engagement

issues. It provides opportunities for face-to-face interactions while harnessing the benefits of digital learning.

3. Methodology

This research uses mixed methods. This study combines two research approaches, namely qualitative research and quantitative research. Mixed research is a research approach that combines qualitative research with quantitative research [52].

The data analysis technique used is the researcher collects qualitative and quantitative data, analyses the two data sets separately and compares the analysis results. If the results deviate, the researcher explains the deviation. The qualitative approach in this study is to describe the application of digital-based adult learning education. The quantitative approach uses descriptive quantitative methods to show the percentage based on the score category of the adult learning education indicator. This descriptive quantitative will describe the trend using statistics with value calculations based on numbers [53].

The measure used in this study is a measure of central tendency in the form of a summary number representing one value in the distribution of scores. The data used is the Mean to describe the responses of all respondents to the items on the instrument, namely through the total score divided by the number of scores. In addition, the scores that appear most frequently are displayed in the score list. This research was conducted at a community education institution, namely CLC in Indonesia, with a total response of 120 students or called learning citizens from 43 CLCs. The instrument used was a questionnaire distributed to 43 CLCs to measure the application of learning in CLC. Then, the interview technique was used to support the depth of the qualitative research results.

The analysis technique of citizen respondents learns about the adult learning education process carried out in each CLC. Then tabulated and the results are summarized in the form of interval distance with the formula in Table 1.

Table 1
Form of interval distance

Minimum Score	= Minimum Score x Number of Respondents = 1 x 20 = 120
Maximum Score	= Weighted Score x Number of Respondents = 5 x 120 = 600
Difference	= Maximum Score – Minimum Score = 600 – 120 = 480
Distance Interval	= Interval: Level (4) = 480: 4 =120

Interval distance for 120 respondents. The minimum score (minimum score x number of respondents) is 120. Meanwhile, the maximum score (weighted score x number of respondents) is 600. There is a difference (maximum score - minimum score) 480, while the interval distance (interval: level) is 120.

4. Results and Discussion

This research on applying digital-based adult learning education obtained 120 respondents from 43 CLCs in Indonesia. Researchers made several indicators to achieve research objectives related to implementing digital-based adult learning education in Indonesia. There are several ALE-based learning indicators proposed by Driscoll [54] those shown in Figure 1 below:

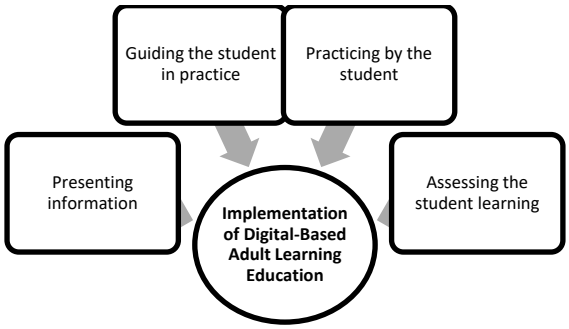

Fig. 1. ALE based learning indicators

With an interval of 120 in each category, the following is an illustration of the distribution of the total score of respondents regarding presenting information on digital-based adult learning education in the form of a continuum line in Figure 2 below:

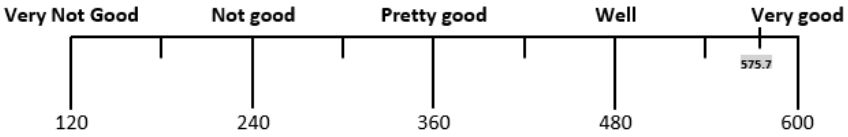

Fig. 2. Total score of presenting information responses

Based on the results of calculations by looking at the continuum line in Figure 2, the average score of respondents' responses regarding presenting information obtained a value of 575.75 and in the classification of intervals, the score is in the very good category. Respondents considered that CLC had provided material according to the learning community's needs. The learning process takes place cooperatively, participatively and collaboratively.

Further data from interviews with CLC managers and learning materials provided in CLC are adjusted to the community's learning needs. This is obtained from the learning needs analysis conducted through interviews with every learning citizen who wants to register himself to CLC. The results of the interviews also show that educators involve learning citizens in the learning process with a digital approach. The digital approach was carried out due to adaptation to the Covid-19 pandemic. The digital approach is like a long-distance communication medium between educators and learning citizens.

The next indicator is guiding the student in practice in digital-based adult learning education in the total score of respondents' responses in the form of a continuum in Figure 3 below:

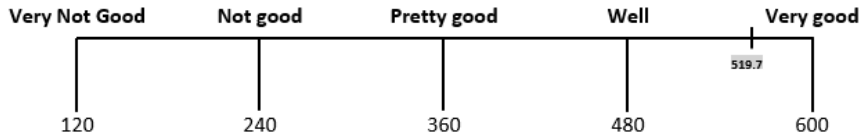

Fig. 3. Total score of the responses of guiding the student in practice

Figure 3 shows the average score of respondents' responses regarding guiding the student in practice; the score is 519.75, which is included in the classification of the score intervals in the good category. CLC has facilitated the citizens of learning to discuss. CLC also provides interesting exercises and quizzes digitally.

Interviews about guiding the student in practice in the learning process at CLC often found adult learner with difficulty in the digital learning process. Various ways are carried out to overcome this, such as conducting training. Not all CLCs conduct training, but more direct assistance during the learning process. However, it takes much work.

During the digital learning process, meeting time is limited. So that educators provide exercises and quizzes digitally through the Google Forms application. However, at the time, educators needed to supervise the practice and quiz process directly. In addition, using exercises and quizzes through the Google Forms application is considered less attractive due to the limited design. Indicator practicing by the student in digital-based adult learning education. The following is the total score of respondents' responses in the form of a continuum in Figure 4 below:

Fig. 4. Total score of practicing by the student responses

Figure 4 shows the average score of respondents' responses regarding practicing by the student; the score is 530.5, which is included in the classification of the score intervals in the good category. Respondents have assessed that CLC has provided material during learning that the learning community wants.

Based on the results of interviews, the learning process is almost the same as in formal education schools in general. Educators explain face-to-face learning materials directly, usually using written media such as blackboards. As for the COVID-19 condition that forces learning to be carried out online, educators deliver material accompanied by PowerPoint with displays on power points designed according to the material to be delivered, making learning more interesting for learning residents. Learning in CLC in Indonesia is more focused on delivering theory. Meanwhile, to support CLC skills, it is focused on skills course programs.

The total score of respondents' responses in the form of a continuum on the last indicator, namely assessing the student's learning, is shown in Figure 5 below:

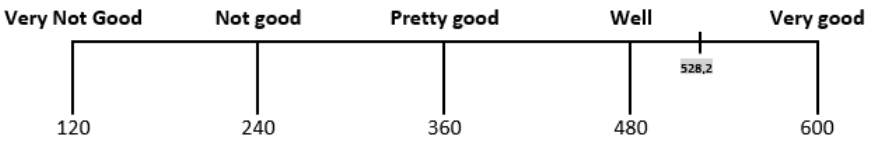

Fig. 5. Total score of responses to assessing the students learning

Figure 5 shows that the average score of respondents' responses regarding assessing the students learning obtained a value of 528.25, which is included in the classification of the score intervals in the good category. Respondents were considered satisfied with the learning and learning facilities in CLC.

The results of interviews that have been carried out with CLC managers, although there has been a change in the system due to the COVID-19 pandemic, which has caused adjustments to learning, there are positive things due to the digitalization of the application of adult learning education. The learning process is even more varied because digitalization forces educators to be even more creative in presenting material for their learning citizens. However, some CLCs still need to be ready for this increasingly sophisticated change, so they still carry out conventional learning. As of 43 CLC, 20% of CLC are still doing conventional learning.

Information and Communication Technology (ICT), in a short period, has become one of the foundations for modern society, inseparable from the world of education. CLC in Indonesia has adapted to the conditions of the COVID-19 pandemic so that learning prioritizes using the digital ICT world in the learning system. The learning curriculum developed by CLC must be able to contribute to the development of the competencies of educators currently stated by Dasli [55], namely:

i. understanding of ICT in education.
ii. curriculum and assessment.
iii. pedagogy.
iv. information and communication technology.
v. organization and administration.
vi. professional teacher learning.

Technology can strengthen and enhance adult learning education, providing a learning environment with resources and tools that can be explored by learning citizens to encourage more independent and adult-centred learning [56-58]. CLC in Indonesia has utilized technology to support the sustainability of adult learning education. This also helped the CLC learning community because learning was considered more cooperative, participatory and collaborative.

Learning in CLC, based on digital adult learning education, is the first step in revitalizing learning [59-61]. Educators package the implementation of the learning program to encourage the transition from the context of pedagogical practice to learning based on digital adult learning education. Based on the findings of several researchers, it shows that adult learning education is one of the strategic approaches to digital learning [56,59,62-64]. Digital-based adult learning education has been implemented in CLC in Indonesia. However, 20% of CLCs still are not ready to digitize adult learning education.

5. Conclusions

The results of the research conducted on 120 responses of adult learner from 43 CLC show the following:

i. CLC has provided materials according to the needs of adult learner with a cooperative, participatory and collaborative learning process [38].
ii. CLC has facilitated its learning citizens to discuss and provide interesting training facilities and quizzes digitally by Jamaludin and Sedek [1].
iii. CLC has provided material at the time of learning that is following what the learning community wants.

iv. The learning community is satisfied with the learning and learning facilities in CLC. Digital-based adult learning education has been implemented in CLCs in the learning system, but 20% of CLCs still need to be ready to digitize adult learning education.

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