
EDUCATION IN THE DIGITAL AGE: ICTS IN FORMAL AND NON FORMAL EDUCATION

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Abstract: This paper attempts to understand the use of ICTs in delivery of Formal and Non Formal Education. It outlines ways to deliver education using ICTs, innovations, and emerging trends. In the process, this paper highlights the advantages accrued by the use of ICTs in education. The impact of ICTs on all education sectors raises challenges for governments, teachers and students. There is a greater demand for and adoption of technology in education in the formal and non-formal education. The realization of the potential of ICTs to improve educational practices is a series of pedagogical and practical challenges. This paper considers the issues commencing with the underlying purpose of education and concludes by raising a series of challenges which educational institutions must face if they are to successfully integrate ICT into teaching and learning practices. The widespread use of ICTs for lifelong and continuous learning as well as community empowerment is a significant trend in making into a reality in the 21st century.

Keywords: Digital Age, ICTs, Formal Education, Non Formal Education

Introduction

Technology has gone through an evolution phase and hence has changed our living style significantly. In today's era, most people prefer using the latest technologically advanced gadgets to perform their daily life activities. People can do a lot of things without spending much time and energy. Whether it is a matter of accessing information from the internet or performing daily life activities, technology is continuously benefiting all of us to do such activities in no time. We all accept the beneficial role of technology in our lives. The modern-day lifestyle has completely changed as now people can shop online from the convenience of home, browse through the internet to conduct all kinds of research or interact with friends from a long distance.

Technology has impacted almost every aspect of life today, and education is no exception. Technology is a powerful tool that can support and transform education in many ways, from making it easier for teachers to create instructional materials to enabling new ways for people to learn and work together. With the worldwide reach of the Internet and the ubiquity of smart devices that can connect to it, a new age of anytime anywhere education is dawning. It will be up to instructional designers and educational technologies to make the most of the opportunities provided by technology to change education so that effective and efficient education is available to everyone everywhere (Purdue, 2021). As for the role of technology in education, namely: Replacing the role of humans, namely by automating a task or process, Strengthening the role of humans, namely presenting information, tasks, or processes, restructuring or making changes to a task or process, ICT as skills and competencies, educational infrastructure, sources of teaching materials, educational aids and facilities, education management support, decision support systems. ICT can be applied in the field of education, such as Computer-Based Learning, Sharing Research Results, Consulting with Experts Through the Internet, Online Libraries, Online Discussions, E-Learning, etc. ICT is impacting on how education is delivered and how students learn. This paper examines some of the key issues surrounding the application of ICT in education and raises a key number of issues that are fundamental to the successful application of ICT across the whole education sector

Internet use is much more common among younger rather than older people, men rather than women, urban rather than rural dwellers, and people with higher levels of education and income' (ILO, 2001). The OECD defines three 'dimensions' of the digital divide: (a) differential access to computers and the Internet by socio-economic background, ethnic group, age and educational background; (b) geographic differences (between cities, regions, countries); and (c) variations in ICT use by industry (small vs. large; different sectors) (OECD, 2001). Digital divide refers to the gap between individuals, households, businesses and geographic areas at different socio-economic levels with regard both to their opportunities to access information and communication technologies (ICTs) and to their use of the Internet for a wide variety of activities. The digital divide reflects various differences among and within countries. The ability of individuals and businesses to take advantage of the Internet varies significantly across the OECD area as well as between OECD and non-member countries. Access to basic telecommunications infrastructures is fundamental to any consideration of the issue, as it precedes and is more widely available than access to and use of the Internet.

Those without access to ICTs and without ICT skills become less and less capable of participating in the knowledge-based society, which makes increasing use of technology and information. The resulting so-called digital divide represents a major challenge for policy-makers at all levels (OECD, 2001).

The Minister of Communication and Information, Republic of Indonesia provides access to infrastructure and telecommunications networks throughout Indonesia. All districts and cities in Indonesia are connected to a network that operators can use to provide high-speed internet access. The existence of infrastructure and high-speed internet network is expected to provide high added value and open up business opportunities.

Information, in a general sense, is processed, organised and structured data. It provides context for data and enables decision making. Information is basically data, which with the addition of learning becomes knowledge. In other words learning which is based on the capacity to find, access, apply and transform information into new knowledge. Important competencies which learners require to make this transformation are often called information literacy competencies and include awareness of the need for information, the ability to critically analyse information and evaluate its usefulness and ultimately to be able to apply the information, turning it into knowledge. Communication is that simple act of dialogue between peoples and cultures that takes on a new dimension when combined with 'information' and 'technology'. Technology is not strictly limited to the Internet and includes simpler technology such as CD ROM, video, television etc although the term 'information technology' does imply the use of the Internet and telecommunication networks. In educational practices, information technology falls into two parts:

1. computer technology which is computer based courses, computerized tests, word processors, graphics software, spreadsheets, databases and presentation software;
2. telecommunications software which offers distance courses, distributed educational resources, e-mail, videoconferencing, bulleting boards, whiteboards and chat' (Serdiukov, 2001).

Non-formal education is provided for community members who need educational services that function as substitutes, additions, and/or complements to formal education in order to support lifelong education (State Law of the Republic of Indonesia, 2003). Non-formal education works to develop the potential of students with an emphasis on mastery of knowledge and functional skills as well as the development of professional attitudes and personalities. Non-formal education includes education for life, early childhood education, youth education, women's empowerment education, skills education and job training, and other education aimed at developing the abilities of students. Non-formal education consist of course institutions, training institutions, study groups, community learning activity centers, and taklim assemblies, etc. Non-formal education programs can be courses, functional literacy, play groups, etc. Non-formal education does not have a rigid pattern and can take place anywhere.

Formal education is a structured and systematic form of learning. This is the education of a certain standard delivered to students by trained teachers. To make sure formal learning is standardized and all learning institutions (schools, colleges, universities, etc.) comply with these standards, formal education in a country is governed by organizations. Formal education is classroom-based, meaning everything a student learns comes books and other educational materials with the sole purpose of educating students. All teachers are trained and licensed to teach children, and they're the same teachers the students will see every day to keep their education and training consistent. Attendance is mandatory and non-optional for children ages 17 and below. If a child fails to show up to class for several days in a row, they may be considered truant. Because it is mandatory, they may be sent to juvenile centers or counseling. Parents may also be charged if they fail to do their duty as a parent and send their children to school. This can result in fines or other penalties on the parents (Througheducation, 2019).

Formal education may be a popular educational method, but it's not the only one. People (even people who are no longer taking formal education) can still continue to learn through informal and non-formal types of education. Non-formal learning is a mix of formal and informal. While it doesn't have a syllabus or curriculum and isn't necessarily taught by people who are licensed to teach, it's more structured than informal learning. Examples of non-formal learning are organizations like the Boy or Girl Scouts, non-credit adult education courses, seminars, and conferences.

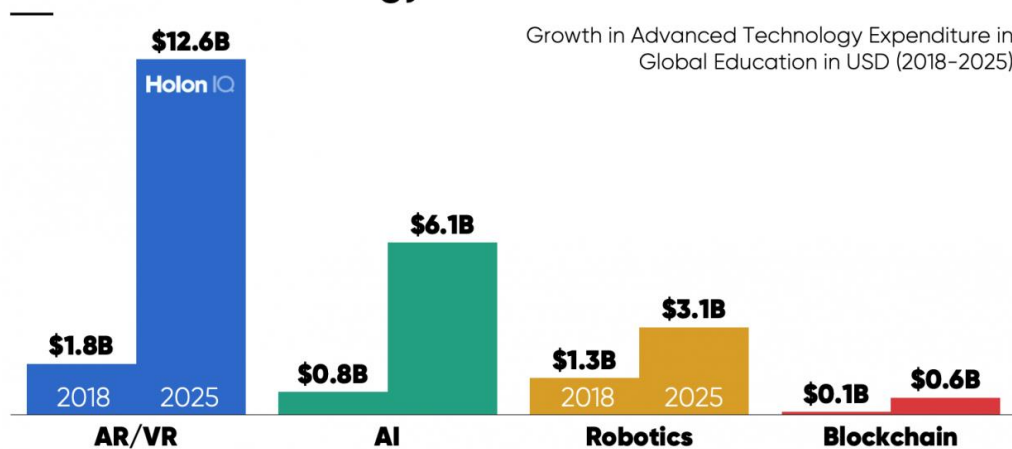
Discussion

In education, ICTs play vital roles in facilitating teaching and learning. They have transformed classroom communication methods and modified instruction strategies. Also, ICTs have made teaching and learning interactive and collaborative instead of the traditional teacher- talking and students listening approach. The application of ICT can take many forms and has the ability to 'revolutionise the way teaching and learning occurs. The concurrent use of multimedia and computers permits the development of new pedagogical approaches involving active and interactive learning' e.g. using computer based learning methods, problem based learning, project based learning, online, video conferencing, satellite links (Salmi, 2001).

Education as a Global Business

The issue of globalization is a critical factor in considering the concept of 'the global village' both in terms of students going abroad for further education and institutions offering courses internationally. The response to globalization as cultural steamroller is cultural diversity'. That is one challenge for us as educators. With the increased use of ICT as a means of instruction, 'the decreased importance of physical distance means that the best (and the worst educational and corporate institutions) of any country can decide to open a branch anywhere in the world or to reach out across borders using the internet or satellite communication links, effectively competing with any national university on its own territory' (Salmi, 2001). This has advantages and disadvantages which raises further challenges to us.

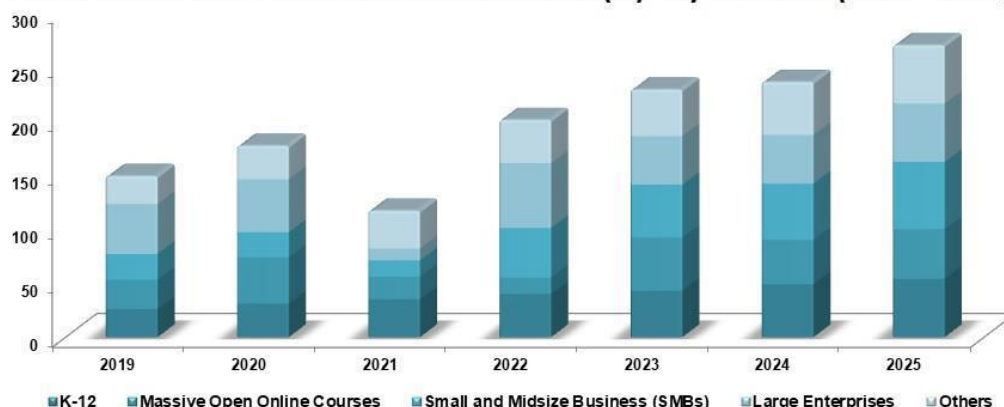
Advanced Technology Growth in Education.



Positioning for the job market.

The increasing diversity of use of ICT in industry is placing proportional demands for ICT to be integrated across the courses. From the student's perspective, the desire to position oneself for the new types of jobs in the knowledge economy provides a strong incentive to mix study programme options and qualifications, often beyond the traditional institutional boundaries. New patterns of demand are emerging, whereby learners attend several institutions or programmes in parallel or sequentially, thus defining their own skill profiles on the labour market' (Salmi, 2001)

Forecast for Online Education Market Share (%) - By End User (2019 - 2025)



Overriding demand was for flexibility, innovativeness, creativity, enterprise, adaptability and the willingness to take risks (in addition to possessing) verbal and written fluency in English while high levels of IT literacy were also mandatory' (Maglen 2001). Educating the global village raises a number of challenges for the education industry. Just as the 'impact of global competition and the ability of industries, organizations and individuals to adapt to new and evolving business environments will be the key determinant in maintaining a sustainable business future', for our students will be the importance of their ability to adapt and obtain qualifications which are relevant and useful in the 21st century (Hunter, 2001)

Some strategies can be done by the educational institutions to be able to anticipate and respond to shifts in business/work requirements, particularly those as a result of the application of ICT, and be able to quickly respond through changes in curriculum, and methodology. Issues for education Using ICT for quality teaching, learning and effective management revolves around issues that can be categorized as practical, pedagogical, policy, philosophical and personal'.

The use of ICT needs to be tempered with reference to sound pedagogical principles. LMS is the latest in a long line of technology that can be used for teaching and learning and it coincides with change at universities teaching approaches. We need to be reflective about the direction and the nature of such change and to keep the focus on pedagogical concerns' (Fetherston, 2001).

Educational practice needs to keep pace with appropriate technology 'as a means of improving education' but not at the expense of further denying the right of access to education by all. There is no argument that to live and work in an ICT dominated world, learners need to graduate with competencies which will ensure that they are critical thinkers and competent problem solvers and able to analyse, interpret, evaluate and apply information to vastly different systems. This raises a range of pedagogical issues for school, vocational education and universities including: a) Facilitating an integrated, collaborative approach to teaching and learning; b) Using ICT to enhance learning by catering for individual learning styles, allowing learners to make connections with knowledge and analyse, explain and apply knowledge to practical applications, make decisions and work cooperatively; c) Selecting and combining different media that suits students' learning styles, for example, using the technical features of the web to the advantage of teaching and learning activities; d) Assessment. If computer based assessment is used that it is an appropriate and valid assessment process; e) The internet needs to be regarded not just as a delivery medium, especially for distance education, but as a potential teaching and learning tool for all students across education sectors; f) Impact on teachers (ICT facilitates a more interactive approach & teachers' ability to change their practices).

Personal issues for teachers as a result of the changing demands which ICT facilitated teaching places on teachers. The challenges for teachers include: (a) Understanding their need to embrace and keep up to date with technology and its application to educational practice. 'To create a more active and interactive learning environment, faculty must have a clear vision as to the purpose of the new technologies and the most effective way of integrating them in their programme design and delivery (and as a result) must educate themselves in the use of the new pedagogical channels and supports (Salmi, 2001); b) Acceptance of pedagogical change, moving from being 'one-way' instructors towards becoming facilitators of learning; c) They will need support as they undergo personal, social and professional change; d) The need for greater flexibility in use of staff may impact on issues such as working conditions and tenure, etc; e) Perceptions of teachers and their role by students. Because of the impact of the media and the Internet, students spend more time in front of the computer and TV than at school, less effort required to absorb new facts etc, 'teachers and schools, having thus lost their leading place in the learning experience, face the new tasks of making

school more appealing to children while implicitly providing them with a “users’ guide” to the media’ (Delors, 1998); f) Communities challenging decisions regarding curriculum and being more involved in school organization.

Part of the technology strategy is the establishment of the Technology School of the Future that has the mandate. To be the major for teacher development in learning technologies in Indonesia; to provide facilities for student groups with their teachers to trial and develop best practice in the use of learning technologies; as a research role to investigate new developments in hardware, software and teaching techniques; to provide out of hours programmes for students of all ages; and to develop partnerships with a wide range of industry leaders in the use of technology in schools.

Institutional policies will have similar themes underpinned by sound strategic planning, both for the short term and the long term. Not suprisingly, due to the ‘lack of strategic planning, many new distance education institutions have adopted inappropriate technologies, failing to assess their adequacy against the purpose of their programmes, the competency of their professors and the learning needs of their students’ (Salmi, 2001). As technology develops the University continually reviews and revises its methods and systems’. These technologies began with radio and television, cassette recorders, video players moving through to use of satellite and digital broadcasting, computers for teaching and learning (from mainframe and terminal based technology through to networked PCs and home based computers) to using the Internet and electronic conferencing systems.

Non-formal education can take many forms including corporate training (self and/or employer funded), continuing education and what we used to call leisure education. ICT is also impacting in these arenas. Just using the Internet itself is a non-formal learning experience.

University of the Third Age (U3A)

The U3A is an international movement whose aims are the education and stimulation of mainly retired members of the community, those in their third ‘age’ of life. There is no universally accepted model for the U3A. Its original conception in France as an extramural university activity was significantly modified in the United Kingdom where it was recognized that most people of retirement age have something to contribute and the emphasis has been on sharing, without formal educational links. Many English-speaking countries have followed this geragogic model, whereas continental European countries have mostly followed the French model. For historical reasons, lifelong learning institute is the term used in the United States for organizations that are similar to U3A groups. A British U3A website reports this about “The Third Age” membership eligibility: “The ‘third age’ is defined by a time in your life (not necessarily chronological) where you have the opportunity to undertake learning for its own sake. There is no minimum age, but a focus on people who are no longer in full-time employment or raising a family.” Typical courses include Art, Classical Studies, Conversation, Computers, Crafts, Debate, Drama, Film/Cinema Studies, History, Languages, Literature, Music, Sciences, Social Sciences, and Philosophy. There are also many less educationally focused activities, such as Games (including bridge tuition and duplicate bridge playing groups), Health, Fitness & Leisure (including countryside walks), Theatre/Concert Clubs, Travel Clubs, and Dance in all its forms. Some study groups work to a formal syllabus, but others draw on current affairs or specific interests of group members. Some groups are designed to cross disciplinary boundaries, for example, combining Society, Technology and Science in a fashion not practical in more formal academic environments. U3A groups are well positioned to conduct serious research into local history and genealogy. For example, a group in Eyemouth collected and exhibited many photographs of life and work in the district over the years. Some groups aim to bridge the generation gap in the field of information technology, opening up an exciting new world to many who might have been oblivious of it otherwise. Internet marketing is especially important for members in more remote locations. Subsequently a group of U3A Online supporters got together and formed a public company, U3A Online Resources Ltd.

Libraries throughout the world always provides opportunities to facilitate non-formal learning and equally have been very early and continual users of ICT. The challenge for us in the formal education system is not to forget that as much education occurs in the non-formal sector as does in our component. The use of ICT may bring both sectors closer together.

One of the most influential concepts of the Delors Report was that of the four pillars of learning. Formal education, the report argued, tends to emphasize certain types of knowledge to the detriment of others that are essential to sustaining human development; (a) Learning to know, by combining a sufficiently broad general knowledge with the opportunity to work in depth on a small number of subjects. This also means learning to learn, so as to benefit from the opportunities education provides throughout life; (b) Learning to do, in order to acquire not only an occupational skill but also, more broadly, the competence to deal with many situations and work in teams. It also means learning to do in the context of young peoples’ various social and work experiences which may

be informal, as a result of the local or national context, or formal, involving courses, alternating study and work; (c) Learning to live together, by developing an understanding of other people and an appreciation of interdependence – carrying out joint projects and learning to manage conflicts -in a spirit of respect for the values of pluralism, mutual understanding and peace; (d) Learning to be, so as better to develop one's personality and be able to act with ever greater autonomy, judgment and personal responsibility. In that connection, education must not disregard any aspect of a person's potential: memory, reasoning, aesthetic sense, physical capacities and communication skills. Formal education systems tend to emphasize the acquisition of knowledge to the detriment of other types of learning; but it is vital now to conceive education in a more encompassing fashion. Such a vision should inform and guide future educational reforms and policy, in relation both to contents and to methods.

The idea of the integrated approach to education reflected in the four pillars of learning has had significant influence on policy debates, teacher training and curriculum development in a range of countries worldwide (Kumari, 2020).

Due to the pandemic, people are working from home if they can, students are learning from home in an online format, and parents are picking up the slack from teachers and supporting their children. This unprecedented event has changed the world and has brought it into a new era; the time of online learning for all people. ICT has invaded and transformed many aspects of our lives to the extent that we live in an environment that is dominated by technology which itself is consumer-driven. No matter how we perceive its presence, there is no denying that it is an important part of our lives and that it is here to stay. Key issues to remember in relation to the importance of ICT in Education are that: (a) E-learning or Online Learning; (b) ICT brings inclusion; (c) ICT promotes higher-order thinking skills; (d) ICT enhances subject learning; (e) ICT use develops ICT literacy and ICT Capability; (f) ICT use encourages collaboration; (g) ICT use motivates learning; (h) ICT in education improves engagement and knowledge retention; (i) ICT use allows for effective Differentiation Instruction with technology; (j) ICT integration is a key part of the national curriculum; (k) We live in a "knowledge economy". ICTs will continue to be a significant part of our future as it connects itself to more and more parts of our lives. It will continually evolve and change because as consumers we all like a choice. We like to use ICT for personal growth, creativity, and joy, consumption, and wealth. It is important for students to engage with ICT so that: Learn 21st-century skills and develop their ICT capability and ICT literacy; Improves their attainment levels; Prepares them for an integrated society dominated by ICT developments; So that they learn the notion of using ICT as a tool for lifelong learning. Technology integration in the classroom is an instructional choice by us, and should always involve collaboration and deliberate planning (ICTE Solutions Australia, 2021).

ICT offers tools that can accelerate development by providing greater access to and use of information. Literacy and education have a critical role in reaping the greatest advantages from the emerging digital era. Education is not merely an outcome of economic growth, it is an important input to growth as well and an input whose importance is increasing. The promotion of education and literacy generally, digital and information literacy in particular, is a key challenge facing all countries (ILO, 2001).

Conclusion

ICT is an essential and a widespread means to perform meaningful task in modifying and modernizing present educational systems and the mode of learning. Not just in formal and non formal education, it is a valuable part of several aspects of the daily lives. ICT is basically a technology that helps to obtain access to information. The positive impact of ICT on students' skills and teamwork are included. ICT also help student and teacher with activities that are provided in the websites. That kind of activities gives ideas to the teachers in their teaching, so that students enjoy the class. Students learn more independently at the same time. Information and Communication Technologies (ICTs) is a broader term for Information Technology (IT), which refers to all communication technologies, including the internet, wireless networks, cell phones, computers, software, middleware, video-conferencing, social networking, and other media applications and services. ICT enables the use of innovative educational resources and the renewal of learning methods, establishing a more active collaboration of students and the simultaneous acquisition of technological knowledge. Furthermore, ICTs are of great help in developing discernment. The uses of information and communication technologies (ICTs) to guarantee access to formal and non-formal education. ICTs are not only useful to insure the access to education in the classroom, but also outside of it. ICTs can improve the communication & coordination that are key to organisational success and can significantly enhance the performance of key actors in rebuilding the education system affected by pandemic covid-19.

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Biography



Wiwik Ariesta is a lecturer and an educational researcher in Ministry of Education, Culture, Research and Technology, Republic of Indonesia. She attended Elementary School, Middle School and High School in Palembang. The author graduated with a Bachelor's Degree at Sriwijaya University of Indralaya and Postgraduate Degree in Educational Technology.



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Lita Ariyanti was born in Surabaya, March 22, 1995. The author is a lecturer at Nahdlatul Ulama University of Blitar. She graduated with a Bachelor's Degree from the State University of Surabaya in 2017 and a Master's Degree at the State University of Malang, majoring in basic education, concentrating on classroom teachers. The author earned a degree Certified Public Speaker in 2019, organized by IPSA (Indonesian Professional Speakers Association). The author is a doctoral student at the State University of Malang. She has worked as an archery coach at SMPIT Ustman Bin Affan, SMPIT Lukmanul Hakim, basketball coach at the middle school of Hang Tua 1, LBB ACI Outlet Leader, Intern at Ban Tahlo Halo School Yala Thailand, co-ass Bacakilat Training, Content writer of Bernas group. Currently the author works at Next Edu and is studying Multiple Intelligence Research. The author actively writes and attends seminars both nationally and internationally with a focus on the field of elementary school and also actively writes self-development writing. The author is also a member of several writer communities including; Nulisyuk, Preneur Writer, MMO, Indonesian Writers Association, Rumah Zakat Volunteer, Writing Team Inspirator Academy. The author has been invited to fill an online writing class, the national online learning online class also filled the Public Speaking for Teacher class in our 100-hour devotional activity for the best educators in the country with the Inspirator Academy program with PLN.



Sri Hartono was born on December 30th, 1971 in Sukoharjo. The author is a lecturer at the Economics Faculty, Management Study Program in Muhammadiyah University, Ponorogo. The author is a consultant in the entrepreneurship. He got his Bachelor's Degree at Muhammadiyah University, Ponorogo in 1997 and his Master's Degree at Wijaya Putra University, Surabaya in 2001. The author is a doctoral student in Sultan Agung University, Semarang. He is active in conducting research and community service.



Nuryati was born in Serang City, Banten. The author graduated from the Diploma II of Kindergarten Teacher Education (PGTK) study program at Sultan Ageng Tirtayasa University of Serang in 2010. She graduated with a Bachelor's degree in Early Childhood Education (PAUD) study program at Sultan Ageng Tirtayasa University of Serang in 2012. The author graduated with a Master's degree in Early Childhood Education (PAUD) study program at the State University of Jakarta in 2016. The author is a student of the doctoral education program at Sultan Ageng Tirtayasa University, Serang City. The author works at several Universities in Indonesia, such as; the Sultan Maulana Hasanudin State Islamic University (UIN) of Banten, STKIP Site of Banten, Muhammadiyah University of Tangerang City, STKIP Pokjar Petir and Pokjar Taktakan, and UIN in Medan City, North Sumatra. The author has published some books, modules and articles in some journals and proceedings.