

Developing Innovation and Based on Smart Madrasah Model in Malang

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ABSTRACT

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Concept of smart madrasah is created as a response on complexity of challenges in education world. This research aims to determine the model of smart madrasah in Malang city. The development model is determined by measuring madrasah readiness level for information and communication technology. This research is mix method using consequential explanatory strategy through quantitative stage in data collection technique and then the data analysis is followed by qualitative in interpretation stages of overall analysis. Research location is Al Izzah senior high school Batu having high potential in implementing Smart Madrasah. Results of the research show that the madrasah has e-readiness on ICT by 94.1 %, e-literacy level on ICT by 99.4 %.

ABSTRAK

Kata Kunci:

Manajemen Berbasis

Madrasah;

Sistem Informasi

Manajemen;


SMART Madrasah.

Konsep SMART madrasah lahir sebagai jawaban atas kompleksitas tantangan dalam dunia pendidikan. Penelitian ini bertujuan untuk mengetahui model smart madrasah di kota Malang. Pengembangan model diketahui dengan mengukur tingkat kesiapan madrasah terhadap teknologi informasi dan komunikasi. Penelitian ini berjenis model campuran *-mixmethod-* menggunakan strategi eksplanatoris sekuensial dengan tahapan kuantitatif pada tahap pengumpulan dan analisis data dilanjutkan dengan kualitatif pada tahap interpretasi keseluruhan analisis. Lokasi penelitian adalah SMA Al Izzah Batu yang memiliki potensi tinggi dalam implementasi Smart Madrasah. Hasil penelitian menunjukkan madrasah memiliki tingkat kesiapan (e-readiness) terhadap TIK sebesar 94.1 %, tingkat pemahaman (e-literacy) terhadap TIK sebesar 99.4 %

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INTRODUCTION

Education level in Malang city is the highest one in Indonesia. By supports given by all stakeholders of education, the government of Malang city targets Malang as international level education world (Reaksi Tugu Malang, 2020). Such linearity is in line with the history of Malang city as known by its education since the Dutch colonial era (merdeka.com). The data show that there are 80 universities distributed in surrounding Great Malang.

An issue of human resources is increasingly seen as a main attention for companies and country. Individual quality and talent is seen as the key for growth, creation of work opportunity and innovation (Zamroni, 2019). Also, madrasah improvement in term of quality and quantity must be balanced by improvement of madrasah quality. One of the efforts taken by intern institutions is optimizing technology in implementation of education system in Madrasah (Azra et al., 2007; Beare et al., 2018).

There is a phenomena in almost in each education institution that public selection is an education institution using information technology in its activity (Fauzi et al., 2018). This is because it serves as one of the assessment elements of education institution quality in presenting education service; one of which is by using information technology (Davidovitch & Wadmany, 2021).

Development and implementation plan of information and communication technology in Indonesia has been formulated in Instruction of the President number 6 of the year 2001. The instruction serves as a follow-up in the form of five-year ICT development plan with priority of collaboration of industrial ICT and ICT in education institution (2001-2005); ICT development and implementation curriculum (2001-2004); Use of ICT as an essential part in learning tool curriculum at schools, universities and training centers (2001-2005) (Prasetyo & Salabi, 2021; Ratnasari et al., 2021)

In 2003, government also issued the latest policy namely Law of National Education System. In this UU Sisdiknas No 20 of 2003 in Article 1 paragraph 15, it mentiones that distance learning is an education in which students are separated with teachers and the learning is using various sources of information and communication technology as well as other media (Indonesia, 2003). To achieve ICT effective development in education, organizations (education institutions) are expected to support and adopt changes in the on-going learning process (Zain et al., 2004). Three innovation dimensions (curriculum, professional development and organizational management) can give mutual support to each other or in the contrary can disable the effective development (Agarwala, 2003; Prasetyo, 2022).

There are many opinions stating that information technology is one of the competition weapons. No doubt since currently information technology has served as one of the tools to improve operational activity efficiency of education institution (Idris & Mesiono, 2019; Rochaeti, 2005). Smart classroom is technology-based learning proposed as a solution to improve efficiency and effectiveness of education service so it can be seen as a quality

benchmark of an education institution (Sunil Prasad Chauhan, 2021). However, smart school concept relies on teaching and learning method which can create more interesting and interactive education system (Garad et al., 2021; Zenchanka & Malchenka, 2017). It can also assist teachers to develop interesting session.

This qualitative study takes Al Izzah Islamic boarding school as the research object. This research aims to determine the capacity of institution to the implementation of smart school in the aspects of readiness and understanding. The principle of development case study as this research method is to illustrate the smart school model which can be described by the theory which enables other Islamic schools to develop more innovative smart school models. There are some relevant studies to the discussion topic taken Siskandar and Usmani (Siskandar, 2020; Usmani & Tabassum, 2018)

METHODS

This research is a mixed-method type model using sequential explanatory strategy with quantitative stages at the stage of data collection and analysis, which is continued with qualitative data at the stages of data collection - data analysis - and interpretation of the whole analysis. The approach in this research is qualitative with a case study type and is conducted at Al Izzah Islamic School Batu-Malang. In this study, it took 25% of the population (104), namely there were 24 people with different competency backgrounds, the sampling technique used was purposive sampling technique, which is a sampling technique for data sources with certain considerations (Creswell, 2009; Siregar, 2015). Data collection used charts, observation, and documentation. Furthermore, the analysis was based on statistics, namely mean, deviation standard, TSR and percentage. The reference for the formulation of instruments to measure the level of *e-readiness* is the *e-readiness Assessment of the Belize National ICT Policy*, while the reference for the formulation of instruments for e-literacy is *Strategic Framework for Promoting ICT Literacy in the Asia-Pacific Region*, while the data collection used questionnaires and certain required documentation. The questionnaire instrument is a researcher guide for conducting surveys that are distributed to stakeholders, school principals, teachers in the educational institution.

RESULT AND DISCUSSION

Smart madrasah or as known as *smart school* is one of the breakthrough in improving education quality through information technology (IT) (Kadir, 2013). This program aims to improve use of IT in administration activity at schools. It is conducted by utilizing IT or iCT for all transactional activities at schools, both in term of learning and education management (Campbell & Crews, 2021; Shone & Parry, 2004).

Implementation of information system management is an inseparable part of implementation of an education institution (Hamzah et. al., 2010). Planning, implementation and development of ICT will not only strengthen teaching implementation

but also directly will improve quality guarantee of education institution mainly related to giving support to competence-based education model (Baharun, 2016).

Use of ICT in education has functions as (1) facilitator of scientific and objective teaching materials; (2) facilitator of motivation improvement for students with low learning spirit; (3) as facilitator of students' achievement ability improvement; (4) as facilitator of improving learning effectiveness; (5) as facilitator of giving easiness in learning design; (6) as facilitator of giving support to implement easy and systematic learning program; (7) as facilitator of improving learning success. There are some references to strengthen writing results namely Lathif, Maimun and Islami (Ilham et al., 2021; Lathif et al., 2020; Maimun & Fitri, 2010).

There are three core processes of education in higher education namely *teaching, research, and services*. These three *core processes* are the offered service by education institution to its customers (Kiran, 1975). Thus, it is necessary for each education institution to have supporting activity for the sake of effectiveness of these core process implementation. For example, academic administration, finance, HR, campus infrastructure and others (Alfiani, 2019; Indrajit, 2010).

An idea of digital school is a facility to improve more well-distributed education access in the future. Thus, education institution can immediately innovate. But they must also take consideration to HR readiness, since without skilled HR, then available equipment cannot maximally explored. According to O'neill, (2002), Attaran, et. al.,(2012) there are some main components of IT-based schools namely (1) content and curriculum, (2) learning process, (3) facility and infrastructure, (4) school HR competence, (5) school administration and management system, (6) infrastructure and superstructure.

At Information System National Conference, it is delivered that initiative strength making madrasah as *smart school/madrasah* greatly depends on *top-leader*, meanwhile there are a little principals of madrasah having political will in developing madrasah as *smart school/madrasah* as the requirement of madrasah to lead Stub of International Level Madrasah or International level Madrasah (Nasional, 2007; Widyastono, 2010).

Information and communication technology management in education must also be managed strategically in order to improve madrasah competitiveness in Indonesia. Januszewski, (2013), Glennan & Melmed, (1996) expressed the objectives of information and communication technology management which is managed strategically is to ensure that the information and communication technology resources can be used efficiently and effectively to support digital-based education service process, or in this context is *smart madrasah* (Sunhaji, 2017). To achieve the aforementioned objectives, it is necessary for a formulation in different levels. There are three levels in managing strategic ICT resources namely strategic level, tactic level and operational level.

There is an increasingly broaden use of *Information and Communication Technology* (ICT) in education world mainly in advanced countries. This fact shows that this media enables the implementation of more effective teaching and learning process (Saettler, 2004). Immature ICT implementation will lead to greater opportunity for failure in ICT utilization.

The ICT implementation failure will lead to considerable loss, both material (financial) losses, time and other supporting resources. To minimize the failure, it is necessary for thorough evaluation on the ICT implementation in the learning process. The evaluation is the evaluation to determine the *e-readiness* level and *e-literacy* level (Asmani, 2011).

Therefore, education or education institution should be able to create humanist learning condition namely enjoying learning condition by optimizing information and communication technology role in education particularly in Islamic education. One of the education institutions in secondary level in Batu city, East Java Province has utilized ICT in its activity process namely Al Izzah Islamic Boarding School. Thus, it is necessary for survey to the education institution to be used as evaluation and reflection material in developing ICT in the future.

There are 4 points used to measure the level of readiness (e-readiness) in this study, namely: 1) readiness of educational institutions; (2) readiness of human resources / teachers; (3) readiness of ICT equipment; and (4) readiness of ICT-related policies. The following are the results of the survey at Al-Izzah Islamic Boarding School Malang on the four levels of readiness (e-readiness):

First: readiness of educational institutions, the results of the questionnaire state that: (1) 86.87% of the respondents state that Al-Izzah Islamic Boarding School may have a vision and mission related to the use of ICT; (2) 99.17% state that the Al-Izzah Islamic Boarding School already has ICT-based facilities and infrastructure; (3) 77.50% state that the madrasah may have special funds to increase the procurement of ICT tools; (4) 100.00% state that Al-Izzah Islamic Boarding School has a website that provided all school information; and (5) 100.00% state that Al-Izzah Islamic Boarding School has a special field / staff that deals with ICT issues.

Second: readiness of human resources / teachers, looking at the readiness level of existing human resources, the survey results state that: (1) 95.00% of the respondents state that teachers and students are able to use ICT equipment in the teaching and learning activity process in class; (2) 95.83% state that the madrasah teachers receive training in order to improve their ability to use ICT-based learning media; (3) 95.00% state that the madrasah teachers are able to use worksheets, presentation compilers and ICT-based learning resources in the teaching and learning process in the classroom; (4) 90.83% state that students can be creative and innovate by utilizing various ICT-based learning media; and (5) 98.30% state that teachers are able to make proper use of internet connections and applications to meet the information needs by students.

Third: readiness of ICT equipment, as for the readiness level of ICT equipment in Al-Izzah Islamic Boarding School Batu, results of the survey stated that: (1) 100.00% of the respondents state that the presence of a permanent LCD and projector is complete in every classroom; (2) 99.17% state that there are rooms that use ICT equipment, such as libraries, labs. Computers, Multimedia Room, and others; (3) 92.50% state that there are hot spots and internet networks that can be used by students; (4) 100.00% state that there is an information system in every aspect, such as academic information systems, PSB information systems,

personnel information systems, and others; (5) 99.17% state that there is a hotline center that connects interactions between the school and the guardian of students / the community; and (6) 99.17% state that there are available backup paper files to support electronic files at the Al-Izzah Islamic Boarding School.

Fourth: readiness of policies related to ICT, and for the last point related to the readiness level of policies related to ICT in the Al-Izzah Islamic Boarding School, results of the survey state that: (1) 99.17% of the respondents state that there are school regulations related to ICT management; (2) 99.17% state that there are principles, terms, and conditions set by schools related to network interactions; (3) 93.30% state that there is a special space for network interconnection; (4) 88.33% state that there is a tariff for ICT equipment used in schools; (5) 94.17% state that there are school regulations in anticipation of data crimes and school networks; and (6) 90.83% state that there is a lot of cooperation between the ICT sector with the business world at Al-Izzah Islamic Boarding School.

From the data above, it can be mapped that in general, Al-Izzah Islamic Boarding School is actually ready for the e-readiness level as a whole, namely 94.2%. The overall details are listed in the following table:

Tabel 1: Level of Percentage (e-Readiness)

No	Tingkat Kesiapan (E-Readiness)	Persentase
1	Readiness of educational institutions	92.6 %
2	Readiness of human resources / teachers	94.8 %
3	Readiness of ICT equipment	98.1 %
4	Readiness of policies related to ICT	93.8 %
Total		94.2%

There are 3 points used to measure the level of e-literacy in this study, namely: (1) understanding of knowledge; (2) understanding of expertise; and (3) understanding of behavior. The following shows the results of the survey on the three e-literacy levels.

First: understanding knowledge about ICT, results of the questionnaire stated that: (1) 100.00% of the respondents stated that they are familiar with using ICT tools such as cell phones, computers, LCDs, the internet, and so on; (2) 97.50% also state that the respondents have expertise in identifying ICT functions; (3) 96.67% state that they have an appreciation of ICT potential functions in their daily lives; (4) 99.17% of the respondents state that they have basic knowledge in using ICT, for example, for the internet, they know how to browse, e-mail, and others; and (5) 99.17% of the respondents state that they can distinguish between virtual world and real world.

Second: understanding of expertise in using ICT, then referring at the level of understanding of the existing respondent's expertise, results of the survey state that: (1) 100.00% of the respondents state that they are able to use ICT features and applications, for example for computers, they can create a database through Microsoft excel; (2) 100.00% state that the respondents are able to access and search for information through websites such as:

registering on the internet, operating a search engine, using key words, and others; (3) 100.00% of the respondents state that they are able to use internet services such as opening and sending e-mails, creating blogs, and others; (4) 99.17% state that the respondents are able to process and collect data in the form of a database; (5) 96.67% of the respondents state that they are able to convert data into graphical data displays and other visual formats; (6) 100.00% state that the respondents are able to utilize ICT to support critical thinking, creativity and innovate for the benefit of education, networking, and recreational purposes; and (7) 95.00% state that the respondents are able to distinguish credibility, such as: differences in relevant and irrelevant, subjective and objective, and can distinguish real or virtual issues.

Third: understanding of behavior on ICT, as for the last point related to the level of understanding of the respondents' behavior on ICT, results of the survey state that: (1) 100.00% of the respondents state that they have expertise in using ICT both individually and in teamwork; (2) 99.17% state that the respondents have a sense of responsibility in using technology and the internet; (3) 99.17% of the respondents state that they understand the consequences of using ICT and the impact of using ICT from values and responsibilities, communication praxis, and other behaviors and (4) 98.33% of the respondents state that they understand in assess critically about the impact of technology. From the data above, it can be mapped that in general, the Al-Izzah Islamic Boarding School actually achieve the level of e-literacy as a whole, namely 99.4%. The overall details are listed in the following table:

Tabel 2: Level of Percentage (*e-literacy*)

No	Tingkat Kesiapan (<i>E-Literacy</i>)	Persentase
1	Understanding knowledge about ICT	98.9 %
2	Understanding of expertise in using ICT	99.5 %
3	Understanding of behavior on ICT	99.8 %
Total		99.4 %

Smart madrasah is a breakthrough in improving education quality through information technology (IT). This program aims to improve use of IT in administration activity at schools. It is conducted by utilizing IT or ICT for all transactional activities at schools, both in term of learning and education management. There are many opinions stating that information technology is one of the competition weapons. No doubt since currently information technology has served as one of the tools to improve operational activity efficiency of education institution (Cassano et al., 2019; Tang & Lee, 2021).

There is a phenomena in almost in each education institution that public selection is an education institution using information technology in its activity. This is because it serves as one of the assessment elements of education institution quality in presenting education service; one of which is by using information technology.

So, implementation of information system management is an inseparable part of implementation of an education institution. Proper planning, implementation and development of ICT will not only strengthen teaching implementation in higher education or schools, but also directly will improve quality guarantee of education institution mainly related to giving support to competence-based education model. This is in line with results of the research above which prove that e-readiness and e-literacy in general in AL-Izzah Islamic Boarding School has have high levels of e-readiness and e-literacy in an overall manner on the ICT so that it can lead to *smart madrasah*.

There are two types of ICT functions according to Abas, (2014) *back office* function and *front office* function (operational support). The *back office* function of IT use is to support administration / operational process. Meanwhile, *front office* function of IT use is to support education implementation leading to improve education institution quality. According to Munir, (2009) implementation of technology in education can give access of learning so there will be improved student quality.

Ely expressed that ICT potential in education is as follow, *first* is to increase the productivity of education by accelerating learning rate; help teachers to make better use of their time; and reduce teacher burden in presenting information, so teachers can foster more and develop children's learning enthusiasm. Thus, teachers will have more function as a learning manager.

Second is to provide more individualized education by way of reducing rigid and conventional teacher control; providing maximum opportunities for learning; serving different individual characteristics, because of various learning options. *Third* is to provide a scientific basis in teaching through a more systematic teaching program planning; and development of teaching materials based on research on human behavior.

Fourth is to further strengthen teaching by means of improving their ability by using various communication media, and presenting information data in a more concrete manner. possibility of learning immediately, because it can reduce separation between learning in and outside the school as well as providing direct knowledge which what outside the school can be brought into class (Nasution, 2008)

Manifestation of ICT excellence conceptual is line with results of the research in Al Izzah Batu, such as available special field / staff dealing with ICT issue, complete availability of permanent LCD and projector at each classroom, the existance of accessible hot spot and internet network by students, the existance of information system in each aspect such as academic information system, PSB information system and employee information system as well as others.

Education technology in teaching is a study and practice to help the learning process and improve performance by making, using and managing process and sources of adequate technology. Education technology experts have opinions that the main role of education technology is to assist to improve overall efficiency in teaching and learning process.

Role of Education Technology in Learning

Technology contribution on improving education quality is in line with studies taken by Noor, van Bruinessen, Sikand, (2008), Sampebua, (2017), Prasetyo, et. al, (2020). Other positive impact of optimizing education technology is the existence of more varied, innovative and imaginative learning model. By this research, it can be concluded some roles of technology in creating smart school, among others are (a) one of the technology roles for students is to help them to improve their learning ability. Since, it is a keep changing field. (b) Information can be illustrated in various ways with the assistance of study materials. Knowledge can be accessible by students in each part of the world by technology implementation in education field. Online class helps students to interact with others students in different locations of the world; (c) since internet is the main media, then students must not always bring heavy bag full of books. They can walk comfortably to the classroom where there are available equipment.

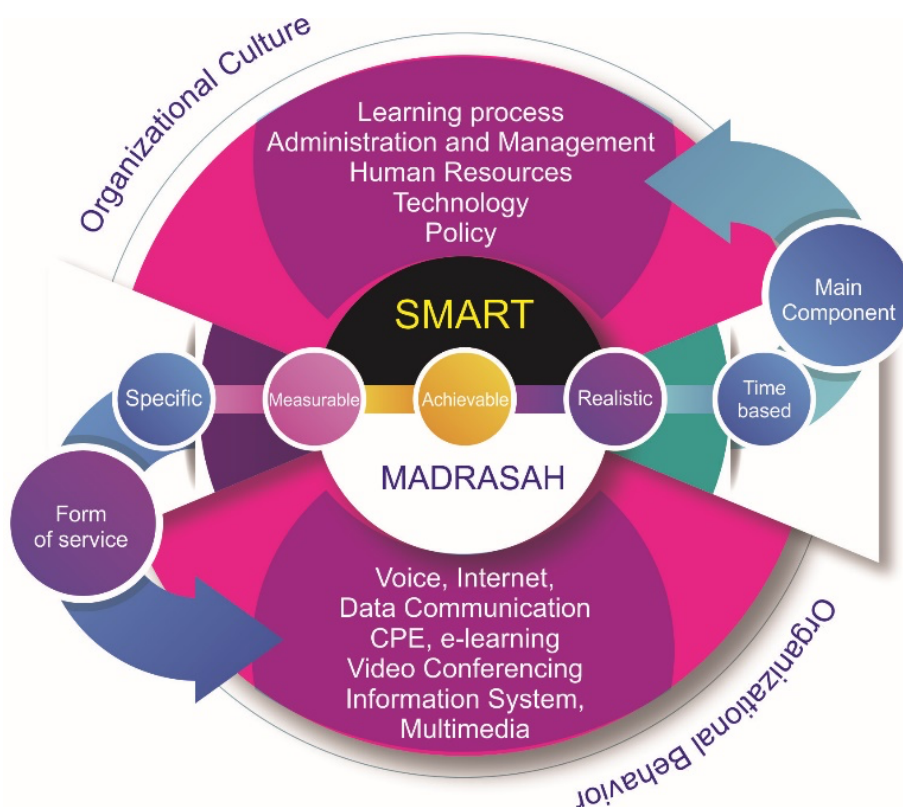


Figure 1: SMART Madrasah Research Development Novelty

Conceptually, SMART means (*specific, measurable, achievable, realistic, time-based*). As an application form of smart madrasah, school managers take managerial approach in the following aspects namely *man, material, machine, money, market, method*. There are some form of smart school service given namely *voice, internet, data communication, CPE, e-learning, video conferencing, information system, and multimedia*. Implementation of smart school management is on (1) content and curriculum, learning process; (2) school administration

and management system; (3) school HR competence, (4) facility and infrastructure, particularly fulfillment of technology aspects, (5) in situation policy in this case is authority of school leader or principal. The components of smart school implementation are supported by studies taken by Mahmudah, (2016), Syahr, (2016), Syarofit, (2016).

Technical excellence as shown by management implementation process of smart school can be seen in the following some aspect namely (a) establishment of special division dealing with ICT issue; (b) technology infrastructure completeness; (c) teachers and students have technology competency standards; (d) digitalisation of online-based learning reports; (e) optimization of ID Card as an access tool for school facilities and functions as school e-banking; (f) synergy of the ICT implementation components has positive impacts on the achievement of learning process.

The results showed that the school meets the standards in readiness and literacy of *Smart School*. Meanwhile, the implementation process taken for several years are necessary for some efforts to revitalize it, especially related to teacher competency sector. The strategies used in the form of managerial and operational functions have been well organized and standardized, even though the management of education and staff development has not been maximized.

Efforts to improve quality services based on Smart School include a process of educating teachers by using standardized and systematic procedures so as to bring added benefits and values to the school. Technically, fulfillment of the futures targets by the institution is more specific and selective. Operational functions including planning, recruitment, selection, orientation, placement and assignment, compensation and welfare, empowerment, competency development, appraisal, and termination of work relations have been well organized and standardized. For teachers who have a good job, it can be maintained by joining training program so that they can improve skills and expertise for long term in the future. By monthly training, it is expected that it will be able to take steps in increasing teacher competence.

CONCLUSION

Al-Izzah Islamic boarding school is greatly potential as the center of smart school-based Islamic school development in Malang regency. The implementation of smart school is performed in the learning processes namely management system, teacher competence, technology-based infrastructure, supports of institutional policy. Meeting these aspects leads Al Izzah Islamic boarding school as an Islamic school with technical excellences which are shown through results of the research in the following aspects, namely: establishment of special section handling with ICT issue; completeness of technology infrastructure; teachers and students having technology competence standard; digitalization of online-based learning reports; optimization of ID card as school facility access and functions as school e-banking; synergy of ICT implementer components giving positive effects on achievement of learning process.

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