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Concept of Smart City for Education: A Case Study in Kendari, Southeast Sulawesi

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Abstract

One of the aspects of a smart city is smart education. Presently, several cities have been implementing the concept of smart city to improve the quality of life of the society, including in the field of education. The educational system is currently heading to the collaboration between information technology and communication. Concepts of education are, therefore, required in the implementation of a smart city. The purpose of the research was to come up with smart city concepts in educational sector. There were two aspects playing an important role in the implementation of smart city. The aspects were educational system and educational technology. These concepts allowed the government to create educational programs in accordance with smart city such as (1) the aspect of education system by establishing ICT center in every school that is connected to the education agency, (2) aspect of education technology by creating education information system, e-learning, online new student enrollment, computer base examination, application of smartphone for learning, student monitoring system for parents, smart library, and e-academic record. The research was limited to the primary and junior high schools. The research generated concepts of smart city for education that are acceptable in other cities where smart city has been implemented.

Keywords: concept, smart city, education

1. Introduction

Current education system in Indonesia has been integrating information technology and communication. The presence of e-learning and digital learning even computer-based national final examination in the level of secondary schools requires schools and universities to develop smart education. Kendari, as the capital of Southeast Sulawesi, needs to generate smart schools in order to be more advanced than other cities. The use of computer or smart phone to support learning process is part of smart education. The use of technological devices should not be merely for entertainment and

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communication, but they are also beneficial for learning process. Presently, learning application and e-learning to allow the collaboration between teachers and students, even with parents can now be downloaded for free through the app store. If required, the government through education agency needs to provide special platforms to support smart education.

Moreover, the recruitment of new students in primary, secondary and university level have been run through online system to minimize nepotism. Based on data collected from the schools in Kendari, the number of school in the level of primary and secondary was 218 schools consisting of 156 state schools and 62 private schools (source: http://dapo.dikdasmen.kemdikbud.go.id/) and was distributed to 10 regencies. From the overall total, better integrated management is required to back up the programs of city government to realize Kendari as a smart city.

Given that condition, it is important to generate a concept of education to cities which implement smart city in order to have basic frame of formulating government policy on education encompassing the concept of management information system, infrastructure of information technology, e-learning, and human resources from educational agency to student and other supporting components.

2. Literature Review

2.1. Smart city

There are some definitions about smart city: A city well performing in a forward-looking way in economy, people, governance, mobility, environment, and living, built on smart combination of endowments and activities of self-decisive, independent and aware citizens. (1) A city connecting the physical infrastructure, the social infrastructure, and the business infrastructure to leverage the collective intelligence of the city (2) the use of smart computing technologies to make the critical infrastructure components and service of a city – which include city administration, education, healthcare, public safety, real estate, transportation, and utilities – more intelligent, interconnected, and efficient. (3) Alaa Dalghan is an expert in smart city and a director of Middle East and Africa at B&B SmartWorx revealed in a seminar of The Big 5, "Smart city is not just about technology. Smart city is about using natural resource more efficiently and environmentally friendly. And the most important is creating services to improve quality of life."

Some factors of people and communities according to Hafedh Chourabi et al. (2012) are:

1. Digital divide(s)

2. Information and community gatekeepers

3. Participation and partnership

4. Communication

5. Education

6. Quality of life

7. Accessibility

One of important factors in the implementation of smart city is education. Therefore, the present study investigated how the concept of smart city fit into education.

2.2. Education condition in Kendari

TABLE 1: The condition of education in Kendari.

No.	Regency	Elementary School	Junior High School	Senior High School	Vocational School	Disabled School
1	West Kendari	24	9	6	2	0
2	Abeli	20	3	1	0	0
3	Mandonga	16	2	2	2	1
4	Kadia	10	4	3	4	1
5	Kendari	15	3	2	1	0
6	Baruga	8	4	3	4	1
7	Poasia	12	3	1	3	0
8	Kambu	8	4	2	4	0
9	Puuwatu	11	3	2	0	0
10	Wua-Wua	6	3	2	3	0
Total		130	38	24	23	3
		218				

Source: *http://dapo.dikdasmen.kemdikbud.go.id/*

It can be seen from Table 1 that there are 218 schools spread in 10 regencies.

The government of Kendari released a policy, as stated in local regulation No. 8, 2013 in relation to the Community Movement to Use Intensive Learning Time Compulsory in Kendari, locally known as GEMAWIBAWA. The movement aimed to realize a learning community to achieve intellectual, emotional, and spiritual intelligence and to initiate Kendari as an educational city in Southeast Sulawesi.

The organizers of GEMAWIBAWA are: (1).The main organizer consisted of: a. all formal, informal and non-formal education agencies; b. family; c. worshipping houses; d. national education agency in Kendari; e. Ministry of Religion in Kendari; (2) supporting organizers: (a) ordinary society; (b) education council and school committee; (c) women and youth organization; (d). government agencies from sub district head, village head, neighborhood and hamlet; (e) security officers in the level of city, district or sub district; and (f) non-government organization.

Furthermore, in the implementation of education and its success, there are eight educational national standards to be considered: (1) Alumni competition, (2) Quality, (3) Process, (4) Education and educational personnel, (5) Infrastructure, (6) Management, (7) Education cost, and (8) Education examination. These eight points have become the standard in designing the concept of education to implement smart city.

2.3. Educational technology

Technology is a supporting aspect in smart city. The implementation of educational technology in the concept of smart city is essential. The present study focused on the implementation of technology, particularly information technology as supporting device to achieve the purpose of education as stated in eight standards of national education. According to Percival & Ellington and some experts of AECT, 1997and 1994, educational technologies are:

1. An important terminology relating to educational technology, teaching and learning process, learning condition, affectivity, efficiency and empiric.

2. Institution of educational technology, CET and NCPL in UK describes in page 19–20 that educational technology serves as development, application and evaluation of system, method, and supporting device to improve learning process of human

Salamah (2006) explained that education is viewed as a system because it involves components that are connected to each other to attain the purposes of education effectively and efficiently. The components are: input (students), instrumental input

(teachers, administrative, facilities, curriculum, financial), environmental input (society and natural environment), education transformation process, and output (alumni). These components play an important role in achieving high quality outputs. Education as a system is presented in the following diagram (7).
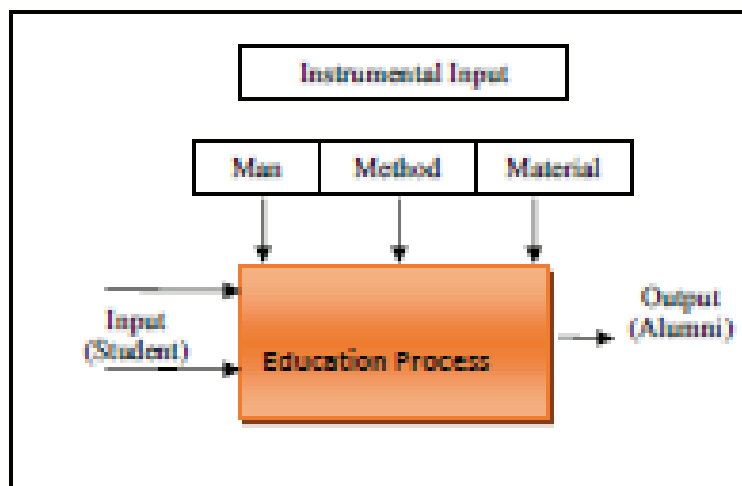

Figure 1: Education is presented as a system.

3. Method

In the present study, the authors used library research by exploring educational national system and looking at its connection to the system and current condition of education in Kendari as a study case, how the implementation of eight national education standards based on the concept of smart city, particularly in the implementation of technology in order to come up with the formulation on how to design a concept of smart city for education that covers the entire supporting aspects of education, and how the connection between smart education system with government, schools and society.

4. Results and Discussion

The concept of smart city for education was designed comprehensively from the entire supporting aspects staring from the government city to the parents. The following is the design of smart education.

The main component of design as shown in Figure 1 was smart system in education. The system consisted of some parts as presented in Table 2.
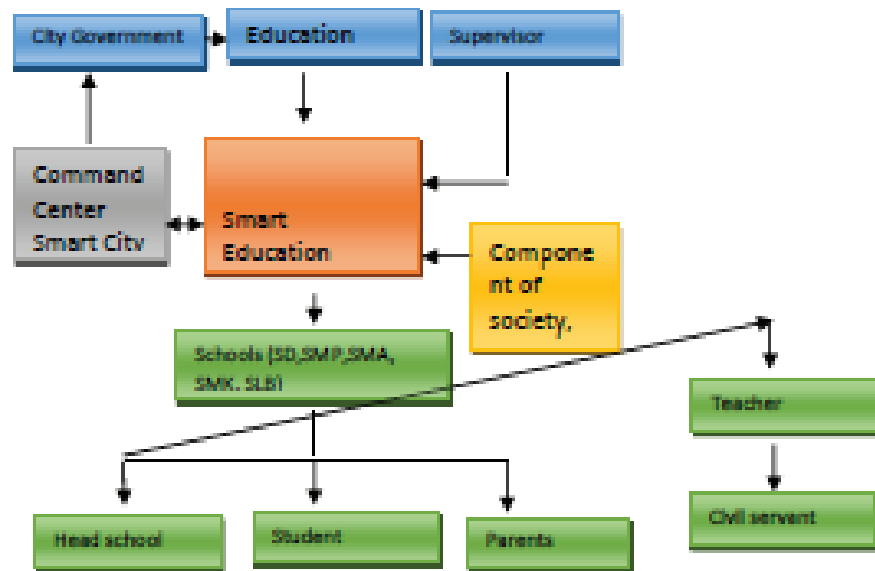
Figure 2: Design of smart city concept for education.

System of smart education was designed based on eight national education standards, as presented in Table 3.

It was shown in Table 2 that the relationship between national education standard and the concept of smart education system. The system is connected to command center placed in regional government offices so that all aspects can be monitored by the highest governmental head. Moreover, educational and supervision agency will be easy to monitor, and the entire process was taken place in schools as well as society components, instances, industrial words and business, and parents are able to monitor the students through the system and to use e-consulting system to consult with teachers.

5. Conclusion

In conclusion, the concept of smart city for education contains eight standards of national education by gaining benefit from technology, particularly information technology and communication by establishing smart education system connected to government as a policy maker, school as executor, student parents and society as the object of the education.

Table 2: System of smart education.

No.	Type of system	Use	Platform
1	Dapodik *(Data Pokok Pendidikan)*	Main education data Data service of student and alumni, teacher and worker, school facility, School operational cost, etc.	Web/center *http:// dapo.dikdasmen. kemdikbud.go.id/*
2	The smart	Smart Indonesian service	Web/center
3	Accreditation	Accreditation serive of school	Web/center
4	Learning house	Online source	Web/center
5	E-ducation online	TV Education services, Educaton voices, education videos, Education mobile	Web/center
6	Ki Hajar	Improve student capacity through competiton and qiuz	Web/center
7	e-Book	Online reading service	Web and Mobile/center and regional
8	e-Raport	Scoring and Online academic record	Web/Pusat dan Daerah
9	e-Learning	Online learning	Web and Mobile/regional
10	Teacher Learners	Teacher learning services	Web/center
11	UKG	Teacher competition test	Web/center
12	UNBK	Computer-based national exam	Web/center
13	USBK	Computer-based examination	Web/regional
14	e-schoolarship	Online schoolarship selection	Web/center and regional
15	Techno Park	Technology and development center	Web, Facility and vanue/center and regional
16	e-skillful	Practicum exchange, internship and vocational school	Web center and regional
17	e- Language	Language center	Web, facility and venue/regional
18	DigiLib	Digital Library	Web/center and regional
19	Competition test/LSP	Competition test service and certification	Web, facility and venue/regional
20	e-Curriculum	Curriculum center	Web/center
21	e- Konseling	Conseling serives for students and parents	Web/Regional

TABLE 3: Relationship between national education standard and the concept of smart education.

Standard of National Education	System of Smart Education
1. Alumni Competition	UNBK, USBK, Accreditation, Ki Hajar, Competition test/LSP
2. Quality	Dapodik, Accreditation, Techno Park, e-skillful, e-Curriculum
3. Process	Dapodik, Accreditation, Learning house, e-online education, e-Book, e-Learning, e-skilfull, e-language, DigiLib, Competition test/LSP, e- conseling
4. Education and Education Personnel	Dapodik, Accreditation, Teacher learning, UKG, e-language, e-conseling
5. Facilities	Dapodik, Accreditation, Techno Park, DigiLib
6. Management	Dapodik, Accreditation, Techno Park, e-counseling
7. Education Cost	Dapodik, accredition, the smart, e-scholarship
8. Evaluation Education	UNBK, USBK, Accreditation, e-accademic record, Competition test

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