



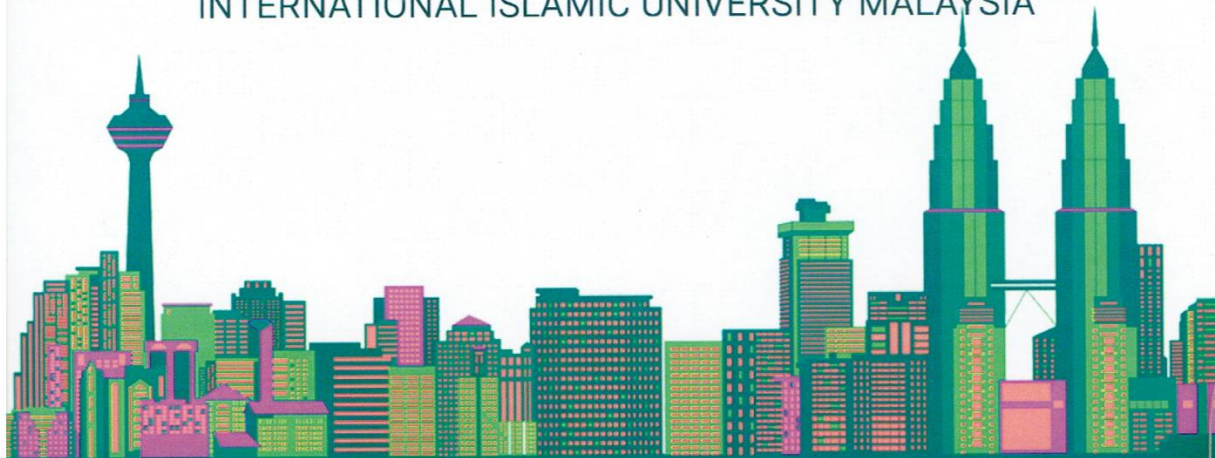
THE 6th
ACEH DEVELOPMENT
INTERNATIONAL CONFERENCE 2017
PROCEEDINGS

"Optimizing Applicable Researches"

VOLUME 1

KUALA LUMPUR,
MARCH 24-26, 2017

INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA



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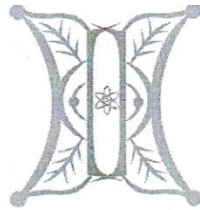


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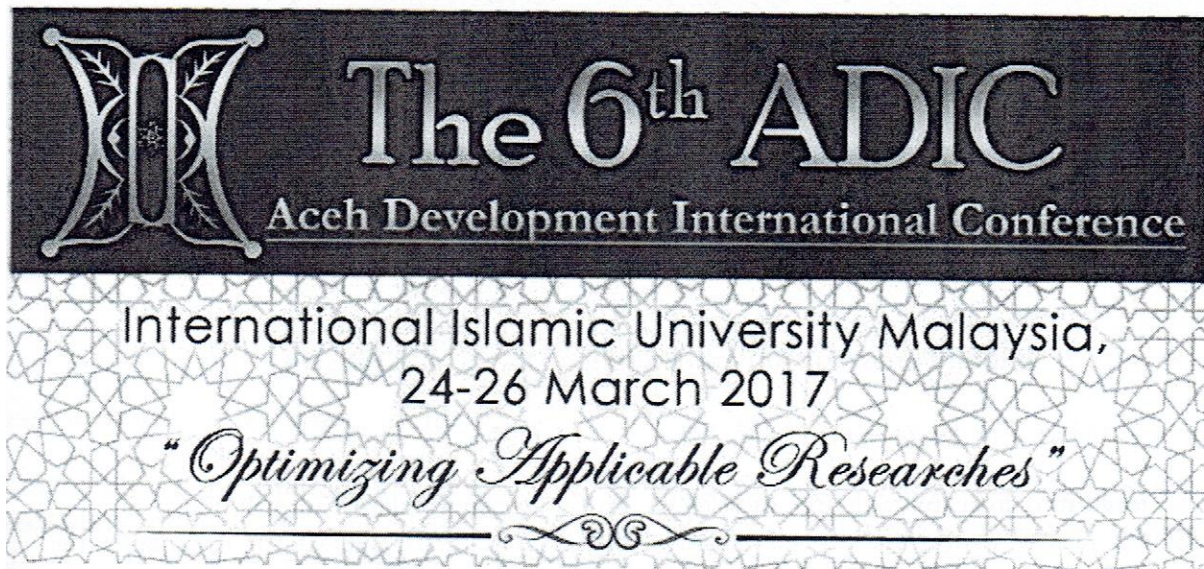
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Welcoming Message



Message from the Regional Development Agency of Aceh Badan Perencanaan Pembangunan Daerah (BAPPEDA)

Assalaamu'alaikum Warahmatullahi Wabarakatuh

I am honored to deliver this welcome message and proudly congratulate Tanoh Rincong Student Association (TARSA) at International Islamic University Malaysia (IIUM) for organizing the Sixth Aceh Development International Conference (ADIC) 2017 in collaboration with the International Association of Acehese Scholars (IAAS). As a continuation of the success of the previous ADIC, this joint effort between students and scholars is certainly an encouraging opportunity for all interested parties to promote the development as well as the welfare of the Acehese.

After the Indian Ocean Tsunami of December 2004, Aceh is now in various stages of development in different areas. The subsequent Memorandum of Understanding in 2005 ending three decades of armed conflict has opened up Aceh to International aids, trades, ideas and potential investments. I see the future of Aceh as economically a self-governing economic space and a newly opened to overseas investors, culturally as a united territory of diverse cultures and districts, and geographically as a site of revivable trade connections to the Malay and Islamic worlds. I sincerely believe that we will achieve a better future of Aceh development with the attention given by many thinkers, academics and professionals like what we are doing now in this conference.

Finally, I am confident that ADIC is a good platform to accommodate intellectual discussions, practical issues, and exchange of ideas relevant to the future of Aceh development. May Allah SWT guide us always to pave the ways for accelerating the welfare of the *ummah*, especially Acehese people. My best wishes for the success of this conference and the outcome it may bring in the future.

Wassalam,

Prof. Dr. Ir. Amhar Abubakar, MS
Head of the Regional Development Agency of Aceh
Badan Perencanaan Pembangunan Daerah (BAPPEDA)

Welcoming Message



Message from the Embassy of the Republic of Indonesia Kuala Lumpur
Kedutaan Besar Republik Indonesia (KBRI) Kuala Lumpur

Assalaamu'alaikum Warahmatullahi Wabarakatuh

On behalf of the Embassy of the Republic of Indonesia Kuala Lumpur, I would like to congratulate Tanoh Rincong Students Association (TARSA) at International Islamic University Malaysia (IIUM) in collaboration with the International Association of Acehese Scholars (IAAS) in Malaysia for successfully conducting the 6th Aceh Development International Conference (ADIC) 2017. It is our duty to support any event that will bring good outcomes for both countries, Indonesia and Malaysia.

As we know that the diplomatic connection between Indonesia and Malaysia has been established since the independence of Malaysia in 1957. Even though we have ups and downs along the way, the relationship of Indonesian and Malaysian people has always been like Brothers and Sisters. We speak more or less the same language and we share the same culture. In order to keep the harmony, the Embassy of Republic of Indonesia Kuala Lumpur always strive to improve every aspect of bilateral connection, such as politics, economy, culture, education, immigration, etc. Thus, through this Aceh Development International Conference (ADIC), we hope that these efforts will keep improving for the best of both countries.

Finally, I would like to thank the organizing committees and all parties for making this conference a success. We look forward for good outcomes specifically for Acehese development and generally for Indonesian and Malaysian relationship.

Wassalam,

Andreano Erwin

Kuasa Usaha Ad Interim, KBRI Kuala Lumpur

Welcoming Message



Message from the President of The Aceh Club Kuala Lumpur

Assalaamu'alaikum Warahmatullahi Wabarakatuh

On behalf of The Aceh Club Kuala Lumpur, I would like to sincerely thank Tanoh Rincong Student Association (TARSA) at International Islamic University Malaysia (IIUM) in collaboration with the International Association of Acehese Scholars (IAAS) for organizing the Sixth Aceh Development International Conference (ADIC) 2017. As a think tank group for Aceh and Acehese people, the Aceh Club Kuala Lumpur always support the continuation of ADIC series to address all the problems and shortcomings in every aspect of Acehese lives. I believe that this conference is a good platform to bring together thinkers, academics and professionals to deliberate and exchange ideas in matters that are of significance for the development and advancement of Aceh.

In the aftermath of 2004 Tsunami disaster and a very long conflict started by the Declaration of Aceh War on 26 March 1873 by the Dutch, Aceh has made impressive achievements and developments. The peaceful agreement between the Free Aceh Movement (GAM) and the Indonesian Government in 2005 has resurrected the economy and livelihood of Acehese people. Thus, it needs to be complemented by a phase of development strategy that will allow Aceh to recover from its decades of conflict and to provide its people with broad-based benefits from its many resources. I really hope that ADIC can achieve that goal and assist the people of Aceh to forge a better future.

Please accept my sincere gratitude to all personnel and organizations involved in making this Aceh Development International Conference possible. It is hoped that the ideas from the keynote addresses and technical paper presentations will stimulate the provision of a framework for Aceh development in the future.

Finally, your determination and contributions in making this conference successful and beneficial are highly appreciated. I wish you all the best and have fruitful discussions with the guidance from Allah SWT.

Wassalam,

Tan Sri Dato' Seri Sanusi Junid
President, The Aceh Club Kuala Lumpur

Welcoming Message



Message from the President of International Islamic University Malaysia

Assalaamu'alaikum Warahmatullahi Wabarakatuh

First of all, I would like to welcome all of you to the 6th Aceh Development International Conference (ADIC) 2017. It is a privilege for the International Islamic University Malaysia (IIUM) to be chosen to host the 6th ADIC 2017. We feel honored because this is the second time for IIUM to host a similar event after the 3rd ADIC in 2012.

Indeed, the relationship between IIUM and Aceh is both strong and fruitful as evident in the number of Acehnese students in IIUM has increased every year since the establishment of the university. In addition, the valuable and beneficial relationship between the brothers and sisters of Malaysia and Aceh has its roots and foundations at the heart of our religion, Islam.

As IIUM vision "aims to become a leading international center of educational excellence which seeks to restore the dynamic and progressive role of the Muslim Ummah in all branches of knowledge and intellectual discourse," I believe that IIUM can contribute to the human capital development in Aceh. With the mission of Integration, Islamization, Internationalization, and Comprehensive Excellence, this framework is fit for Aceh Development International Conference (ADIC).

In the history of the Malay kingdoms, Aceh is well known as a strong proponent of Islam. This is in line with the philosophy of IIUM, which was inspired by the recommendations of the first World Conference on Muslim Education held in Makkah in 1977. The spirit of this philosophy is based on the Holy Qur'an and Traditions of Prophet Muhammad SAW with the message that knowledge is a form of trust (*amanah*) from Allah to man, and hence man should utilize knowledge according to Allah's will in performing his role as the servant and vicegerent (*khalifah*) of Allah on earth.

Finally, on behalf of the IIUM management, I would like to congratulate Tanoh Rincong Student Association (TARSA), the International Association of Acehnese Scholars (IAAS), all committees and participants in this successful gathering of the 6th ADIC 2017. I hope that the discussions are fruitful and rewarding In Sha Allah.

Wassalam,

Y.BHG Tan Sri Dato' Seri Utama Dr. Rais Yatim
President, International Islamic University Malaysia

Welcoming Message



Message from IAAS President and Chief of Editor ADIC 2017

Assalaamu'alaikum Warahmatullahi Wabarakatuh

Aceh Development international Conference (ADIC) is an annual multidiscipline conducted by academicians (lecturers, university students, researchers) and practitioners originated from Aceh, Indonesia. ADIC was initiated from 2010 at University Putera Malaysia, continued in 2011 at National University of Malaysia, in 2012 at International Islamic University Malaysia. Since 2013, ADIC was conducted every 2 years. University Malaya was the host of ADIC 213 and 2015. Now the 6th ADIC 2017 is conducted at International Islamic University Malaysia on 25 and 26 March 2017.

The Editor Committee of ADIC 2017 has successfully managed the papers of the conference. A ninety one papers have been submitted since December 2016. The authors come from various universities, schools and research centers of 6 countries, i. e. Indonesia, Malaysia, Nigeria, Australia, Saudi Arabia and Turkey.

The papers were divided to 15 fields of study, i.e; Education, Language, Islamic Study, Sociology, History, Economics, Management, Law, Engineering and Science, Information Technology, Health, Agriculture, Food, Fishery and Veterinary. Eleven papers have been rejected by the reviewers, due to irrelevant topics to Aceh development and insufficient content. The other 80 papers were accepted without revision, with minor revision or with major revision and were published in this proceeding.

Finally, we would like to extend our congratulation to all of the authors that their papers have been published in The Proceeding of The 6th Aceh Development International Conference 2017. Hopefully, you will meet colleagues of the same field of study in the conference, and continue your collaboration to contribute in Aceh development.

Wassalam,

Dr. Mohammad Iqbal

President of International Association of Acehnese Scholar
Chief of Editor ADIC 2017

Welcoming Message



Message from the Chairman of ADIC 2017

Assalaamu'alaikum Warahmatullahi Wabarakatuh

On behalf of the organizing committee, I would like to welcome all respected keynote speakers, paper presenters, participants and guests of the 6th Aceh Development International Conference (ADIC) 2017. ADIC is an annual program conducted by Acehnese students and scholars in Malaysia. It is a forum for researchers, academicians, governments and public observers around the globe – from all disciplines of knowledge, to share ideas and experiences for the betterment of Aceh. This conference is expected to be a special platform for future development programs in Aceh.

The previous conferences were successfully held in Universiti Putra Malaysia (UPM, 2010), Universiti Kebangsaan Malaysia (UKM, 2011), International Islamic University Malaysia (IIUM, 2012), University of Malaya (UM, 2013), and University of Malaya (UM, 2015). This 6th ADIC 2017 is organized by Tanoh Rincong Students Association (TARSA) at IIUM in collaboration with the International Association of Acehnese Scholars (IAAS), The Aceh Club Kuala Lumpur, Acehnese Student Association (ASA) UM, Badan Kebajikan Mahasiswa Aceh (BAKADMA) UKM, Persatuan Pelajar Aceh (PPA) UPM, and Aceh Student Club (ASC) USM.

The main objectives of the program are to:

- (1) Generate positive ideas in Aceh development for the better future of civilization;
- (2) Generate scientific contributions of academics, professionals and practitioners from various fields of sciences to improve the quality of development in Aceh;
- (3) Invite practitioners, non-government organization activists, government officials and all stakeholders with an interest in improving the advancement and welfare of Aceh; and
- (4) Facilitate Acehnese communities and personnel who live overseas to unify their vision for the betterment of Aceh in the future.

Finally, I would like to thank International Islamic University Malaysia (IIUM) for hosting the 6th ADIC 2017, keynote speakers, organizing committees, editors and reviewers, donators, supporters, presenters, and all participants who have contributing in the success of this conference. May Allah SWT reward you abundantly and may this program benefit for the *Ummah* and Acehnese development.

Wassalam,

Tumin

Chairman of ADIC 2017

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CONSTRUCTIVISM AND APPLICATION FOR DESIGN AND LEARNING

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Abstract

This paper aims to clarify the concept of Constructivism and to present its implications in the course design and learning. Constructivist theory overcomes the weaknesses of previous learning thoughts, cognitivism and behaviorism. The most important thing according to this learning 'philosophy,' Constructivism is that a learning process should facilitate the construction of knowledge by the student. In the process of learning, among other things, inquiry, cooperative, collaborative activities, the connection of learning to the real world and consideration of the students' prior knowledge are crucial to be noted by the teacher. Constructivism is partly criticized, especially by the practitioners of education. However, Constructivism is currently recommended by the educational psychologists.

Keywords: Constructivism, Design, Learning

Introduction

Constructivism is a grand theory or current learning thought recommended by the educational psychologists. Before Constructivism emerged, the grand learning theory was cognitivism which is the improvement of the earliest grand learning theory, behaviorism. This paper is aimed at making clear the concept of Constructivism and to present its implications for course design and learning. To make this presentation clearer, let us have an overview of behaviorism and cognitivism. Behaviorism became references of learning theories around 1920 to 1950. This theory focused on or around stimulus-response. Pieces of research on how the learner learned during that era was limited to providing stimulus and observing the response caused by the stimulus. Attention was just given on the measured and observable behavior. Among others, classroom setting, attention, retention, reward and punishment were primarily addressed by researchers and educators during that era.

Cognitivism which was relatively populer around the period of 1950 to 1980 takes seriously into account the mental process or learner internal process. This theory regards that feeling, learning (observing), remembering and thinking the information is a learner's learning process. Cognitive psychologists have given more highlights on how learners process information internally or mentally. Most of the explanations are commonly known as the *information processing theory*. It is just like the working system of computer. So, when the learners absorb information, they use *input*, *throughput* dan *output* functions. Cognitive psychologists assume that by observing people's response to various events and objects, it is more likely to draw an accurate

conclusion or scholarly guess the cognitive process resulted in their response (Omrod, 2011). The leading figures of the cognitivism are Piaget, Bruner, Ausubel. Some of them are also followers of Constructivism.

Constructivism

Grand theory of learning, Constructivism, has evolved since 1980s and proceeded up till now. This learning 'philosophy' is to overcome the weaknesses of the previous main learning theory, cognitivism. In this theory, the learner constructs knowledge not only based on what he or she absorbs, but also based on his or her prior knowledge, widely known as *schema* or *schemata*. As the result of this adjustment, the learner gains new knowledge. In other words, basically, Constructivism means that the learner develops his or her understanding about the world by experiencing something and reflecting his or her experience (Ed Online, 2004).

Based on Peaget's basic assumption, children are enthusiastic and active knowledge seekers. They have curiosity and actively seek for information to help themselves, and give meaning of what they have been experiencing. They are continuously experimenting with the objects they encounter, manipulating them and observing the effects derived from their activities with the objects. Children construct knowledge rather than absorb it. In daily life, children do not just accept the facts they find. Rather, they recall their past experiences, combine and compare with what they are currently observing on how the world is operating. When children are interacting with pets, visiting the zoo, having a look at the picture and so on, they develop a more complex understanding on animals (Omrod, 2011).

With better organized thought and knowledge, children could think in more complex and logical ways. For example, a child is commencing to differentiate cat and dog or even types of dog. Children learn in 2 ways, that is, through *assimilation* and *accommodation*. *Assimilation* takes place when a child is cognitively dealing with an object in a way that is consistent with his or her available *mental model* or *schemata*. Putting it in another way, a child in a learning process, when interpreting something new, does not face any difficulties because the information or the new knowledge is in line with his or her prior knowledge, his or her *schemata*. Thus, a child just accepts the new knowledge without any problems and this is called *assimilation*. Nevertheless, when a child is experiencing or absorbing new things which are not consistent with their *schemata*, they have to choose one of the two ways, change the *schemata* to accept new knowledge or create new *schemata*. Both these processes are called *accommodation*.

Children's physical interaction with social environment is significant for their cognitive development. According to Piaget, by exploring and manipulating physical objects such as by playing with sand or water, boles, and so on, children would learn characteristics of things such as volume and weight; find the principles related to power and earth's gravitation and so on. In Piaget's view, social interaction is also very influential for children's cognitive development. When a child is interacting with another person such as through conversation, which is sometimes amusing but sometimes not, he or she begins to understand the different points of view of people on something as they grow up. They would know that the different points of view are

reasonable. They also realize that their inaccuracy and illogicality in figuring out something is also natural.

Children, according to Peaget's theory, are often in the condition of *equilibrium* in which they easily interpret and response new events by using their *schemata*. However, a child is growing up and their insight is broader and broader. They then start discovering that their knowledge and skills are not enough yet. Such a situation creates *disequilibrium*, which is a sort of mental insecurity that triggers them to figure out what they are observing. By changing, reorganizing or integrating their *schemata* better in the way of *accommodation*, children would understand better the phenomena that they did not understand before (Omrod, 2011). So, when *disequilibrium* happens a child is increasing his or her knowledge about the world.

Constructivist followers are not in line with the theorists of cognitivism and behaviorism. Cognitivists and behaviorists believe that knowledge is *mind-independent* and it could be formed in the learner. Even though it is not clear cut, cognitivism does not take seriously into account student's prior knowledge and the real world, just focus on the internal information process. Constructivist experts do not deny the existence of the *real world* but have a view that we know the world based on our own interpretation of our experience. Human beings interpret, not just accept the *real world* (Bednar, Cunningham, Duffy & Perry, 1991). To say a straightforward way, people's knowledge is a result of integration between what they are learning and their prior knowledge. The prominent theorists of Constructivism are Thorndike, Watson and Skinner (Budiningsih, 2012).

Literature on constructivism does not address the age level of students suitable for constructivist theory implementation. It is the teacher's job to decide the age level and the appropriate format used to aid in student understanding (Jen & John Uriarte, 2011).

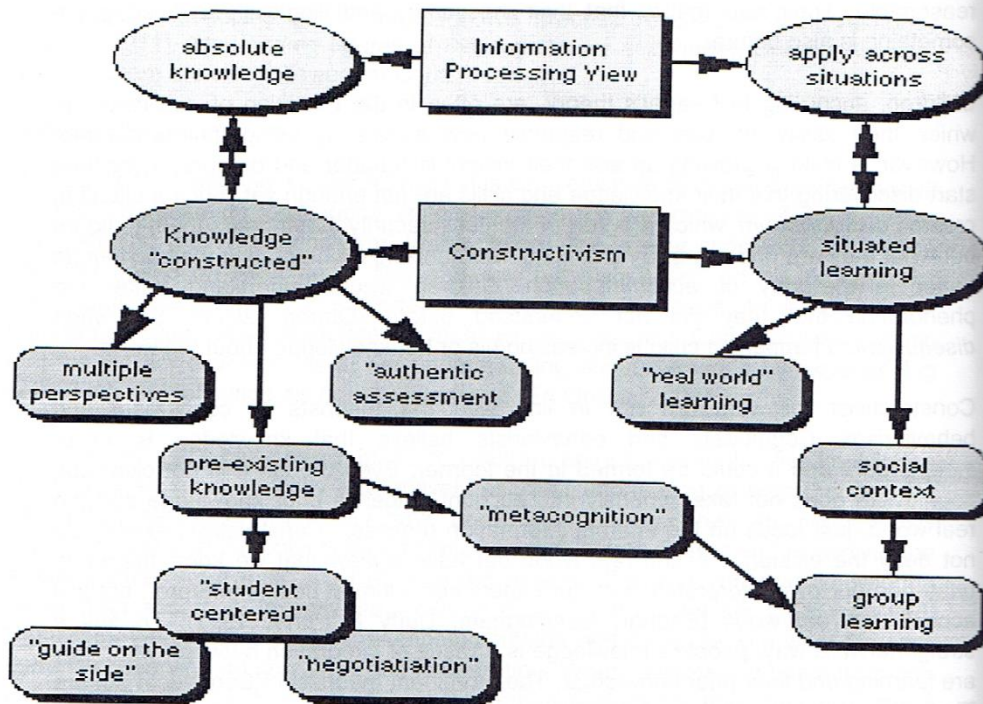


Fig. 1. Constructivist Theory by Richard H. Hall

Constructivist Recommendation for Course Design

Course design is an important step for an effective learning. The most important thing for the design is that, based on Constructivism, instructional objectives are not strictly set, but negotiated. Constructivist view regards that there is no the best way to arrange and sequence the learning. Therefore, the theory of course design system focuses more on the learner's constructivist mental development in accordance with the learning atmosphere. So, accurate and strict learning objectives are not recommended. Above all, based on this learning 'philosophy,' the learning process should facilitate knowledge construction by the learner (Jonassen, 1991). In this case, learning material is not *content-independent knowledge or skills*, but the learning is designed in such a way that it becomes *domain-independent* in which the learner is not guided to achieve too specific instructional objectives. Jonassen urged that current learning atmosphere like cognitive and constructivist *mind-tool* including *databases, hypermedia, and expert systems* be utilized (Jonassen, 1990). In line with this argument Sawyer notes on the significance of computer system equipped with internet facilities. The computers play a significant role as an important access point for information and knowledge access, and it is the source of global education in this juncture, point of time.

Similarly, evaluation also needs to be carried out wisely. According to Sawyer, evaluation needs to be designed in such a way that it takes into account multi-

dimensional instructional goals. As a result, evaluation should be less focused on narrow criteria tests (Sawyer, 1992). Furthermore, it can be said that learning program designed by a designer or teacher should refer to flexible learning objectives intended by the learner, not tutor or teacher's objectives. Course design should organize information in such a way that the learner is able to connect current information with the learner's prior knowledge. *Analogy* and *metaphor* are sorts of cognitive strategies recommended. Other cognitive strategies could be used such as *outlining*, *mnemonics*, *concept mapping*, *advance organizer* etc. (West, Farmer & Wolf, 1991). Constructivist designer recommends the design in a way that helps students explore topics and complex atmosphere. Thus, the learner is encouraged to develop understanding and validate them through social negotiation; learning materials need not be pre-specific; information derived from multi-sources are very important. For example, in the field of instructional design, students are not forced to memorize facts on course design, but students are assisted to use the facts of course design as a course designer does. Several strategies used by constructivist designers include task assigning in the context of real world, cognitive apprenticeships (*modeling* and *coaching* students to experts), multi-perspective presentation (cooperative learning to develop and share different perspectives), social negotiation (debate, discussion, or evidence giving), use of example in the real world, reflective awareness, and providing enough guidance in the process of constructivist usage.

One of the most important tasks of a designer is to understand that learners bring learning experience into the classroom. This learning experience influences learning objectives which would be knowledge and behavior of the students (learning outcomes); determines the most effective way of organizing new information with the eliciting of students' prior knowledge; organizes the learning with feedbacks so that new information could effectively and efficiently assimilated and accommodated in the structure students' cognition (Stepich & Newby, 1988).

Learners do not transfer knowledge from the real world to their memory, but they develop their personal interpretation about the world based on individual interaction and experience. Therefore, internal representation of knowledge is changing continuously and openly; there is no objective reality that the learner strive to know. As consequence of this, it is crucial for a designer to understand the learning that has been taking place in the student him or herself. To know this, prior experience and knowledge of the student should be examined (Bednar et al., 1999).

Constructivist Recommendation for Learning

In line with what has been presented above, *schemata* which is also called the learner's mental *model* is considered very influential in the students' learning process. Therefore, the teacher is asked to count learner's prior knowledge, *schemata*. The learning is *student-centered*. In the other word, students themselves actively construct knowledge, develop their understanding. The teacher functions as a facilitator who facilitates the students' learning instead of spoon-feeding the information into students. In this way, controlled autonomy is given to students so that they could independently do *inquiry*. It is carried out by the students by conducting research, to certain extent, consistent with their task description. To gain

knowledge independently, students could also be engaged in group discussion. Collaborating with classmates in doing project assignment is also recommended by learning 'philosophy' of Constructivism. Constructivism encourages contextual learning. This could be done in a simple way such as asking students something on their daily activities. For instance, suppose that a biology teacher teaches cat anatomy, he or she could ask: "Who has cat at home?" To a high extent, a teacher takes students to the real world to a field, a certain ecosystem, a factory or a garden in accordance with the field of study learned.

Except for this, beliefs, attitude, experience, prior knowledge of the students need to be taken into account by the teacher. Students' prior knowledge plays the most significant role in students' success of learning (Ahmad, 2011). Every student has different prior knowledge. For example, there are two students walking down the street. One comes from a very rich family, but the other belongs to a poor family. Both of them happen to notice IDR. 10.000, - laid on the side of the road. The child coming from the poor family would say that "oh, there is so much money!" While the child deriving from the rich family would say that "ah that is a little money, just IDR 10.000." Beliefs are also different from one child to another particularly in the multi-cultural classrooms. For example, students may interpret hurricane and big flood because of unfriendly natural meteorological power. However, for those who come from Muslim families, those who frequently hear from their parents on this case, the catastrophe is a punishment from God due to human beings' wrong deed. Apart from this, some students may struggle against science curriculum that explores how human beings could manipulate and control natural phenomena, while their culture consistently teach them on the importance of living in harmony with the nature (Omrod, 2011).

Therefore, the constructivist supporters stress on the importance of being wise in using students' prior knowledge, not simply retrieve students' *schemata* (Spiro, Feltovich, Jacobson, & Coulson, 1991). In addition to this, it is also important for a teacher to know that learning should take place in a realistic setting and the learning materials be relevant to students' life experience (Clancey, 1986). The focus of learning is on students' activities instead of spoon-feeding or lecturing. Based this grand theory of learning, Constructivism, students are not allowed to be continually spoon-fed. Or they depend on this way after leaving school. They would become waiters rather than initiative takers in fulfilling their needs. Just a baby needs spoon-feeding. In constructivist view, the transfer of knowledge should be facilitated by involving students in doing real and authentic tasks. Learning should happen in the context and the context would form *link* with the knowledge in it. So, instructional objectives are to describe the students' tasks, not to specifically define learning objectives. People do not learn the instruction usage of a device just by following instruction points. The proper and effective usage derives from getting them to be engaged in real usage of the device in a real situation (Bednar, et al., 1999).

In this way, a teacher equips students to be able to educate themselves independently after leaving school. They would learn along their life which is called *life long education*. They would become initiative takers. Their natural curiosity is maintained. So, learning is seen as a process and students' understanding of

concept is the main concern of the teacher, rather than memorizing learning materials or *rote learning*. The learning condition is carried out in such a way that the learning process would equip the students with the capability of critical thinking and higher order thinking skills. They would get used to using cognitive terminology like *analyze, evaluate, predict* and *create*. Jonassen agrees that for acquisition of basic knowledge, at a certain extent, behaviorism or cognitivism is good to apply. However, he recommends that the transition to constructivist approaches be done when students need to learn much knowledge that equips them with conceptual ability needed for handling unstructured and complex issues well (Jonassen, 1991).

A teacher is also obliged to observe how the students learn (metacognition). By counting the ways each student learns, a teacher could properly treat and be able to develop his or her potential maximally. Apart from this, Constructivism obviously puts emphasis on the creation of cognitive tool that reflects cultural wisdom in which the tool is used. It is no need for the acquisition of complete and detail concepts. To be successful, meaningful, and sustainable, the approach must involve three factors: activity (practice), concept (knowledge), and culture (context) (Brown, Collins & Duguid, 1989). Inquiry is also one of the principles of constructivist learning.

Technological system that could be utilized for learning is very relevant to principles of Constructivism. The real benefit of the presence of Information and Communication Technology (ICT) for learning is equipping students with facility to inquire the information needed. ICT provides abundance of information resources. Using search engine like Google and Yahoo learners could surf, browse and search for information and retrieve the information needed of various fields of study, from fine art to engineering to Islamic Studies and all fields of studies. Then, ICT, among others, also offers feature and interface like facilities for mailing list, WhatsApp, tweeter and the alike which provides tool for users for collaborative activities. Mind-tool, for example, is also a sophisticated computer technology that supports users think critically. So, Constructivism is a learning 'philosophy' which is of relevance to the sophistication of technology, particularly Information and Communication Technology.

There are models of curriculum that have been tried in Indonesia and most of them follow Constructivism. For example, CBSA (Student Active Learning Model) or Curriculum 1984 and Curriculum 2013 adopt main principles of Constructivism. The main characteristic Curriculum 2013 is that it uses Scientific Approach in which students conduct 5 steps in learning: Observing, Asking questions, Exploring, Associating and Communicating. Indeed, the five steps are recommended by principles of Constructivism. In this curriculum, the learning process is student-centered; teacher functions as a facilitator; inquiry is most of the learning process; students are actively engaged in learning activities (Hamalik, 2012); students construct knowledge by observing, asking questions, exploring, associating (experimenting, reasoning, analyzing) and communicating (Mulyasa, 2013).

Conclusion

The application of Constructivism for course design and learning is criticized for not enough details to be applied in the design and process of learning. Relating the

learning to the real world, for example, it is not easy. Investigating students' background to figure out their prior knowledge is also difficult. Handling passive students is another problem which takes time and special skill. The integration of learning and the materials is also neglected in use of Constructivism. This theory ignores strict evaluation system. Therefore, the application of this learning theory is considered having some disadvantages.

However, this grand learning theory is a broad theory. This theory just offers general guides that serve as directions for course design and learning. Constructivism is a current theory recommended by educational psychologists. This grand theory copes with the weaknesses of previous theories such as cognitivism and behaviorism. The advantages, among others, are said that the learner has a deep understanding on the learning materials, because the learner does not learn by heart or memorize the learning stuffs that are fed by lecturing, but the students do inquiry by exploring, experimenting and conducting research themselves. The students learn so confidently that they draw conclusions themselves based on the results of the exploration, experiment and research. Constructivist based-learning is *student-centered*, the teacher plays the role of a facilitator. Students are actively involved in the learning process. Cooperative and collaborative activities are encouraged. Learning activities like this promote multiple perspectives of thought that emerge as a result of information and experience sharing, and of course, the students work together, the strong would help the weak and the weak would learn from the strong. As a result, their tolerance would grow and they would use this social experience in their life and society. As we know that in daily life almost all works are done cooperatively. Teachers have a learning community of those who teach the subject, lecturers have a coordinated group whose members are those who teach the same course, offices have divisions or sections consisting of staff members who do and accomplish similar works, the members of the House of Representative have commissions, medical doctors or surgeons also work together in a team and so on. Then, since the students construct knowledge, draw conclusions themselves and work together, they would become critical thinkers and develop higher order thinking skills and problem solving skills. As a consequence of the learning designed based on principles of Constructivism which stress on the significance of concept understanding, it also indicates that the learner has a good retention of the materials learned. As majority of educational psychologists agree the learners learn at different ways and paces. Some enjoy learning while listening to the music, with pet like cat, by discussing, by asking questions, by being alone in a quiet and peaceful place, and so on. Constructivist learning takes these differences seriously into account. This theory recommends that teachers teach students in a way that considers individual differences.

Constructivist learning urged that the learning be connected to the real world. This recommendation points out one of the main weaknesses of conventional learning approach in which the learning just takes place in the classroom, never connected to the real world. Probably, this is one of the reasons why the quality of education in Indonesia is low and the schools' graduates are not skillful enough in the work place. Constructivism encourages learners to learn how to apply their knowledge in line with the working condition. To apply their knowledge, students are engaged in authentic

tasks. They are trained in a way that they have personal management and study independently. Above all, this approach promotes metacognition skills which are of use for future students' learning process and lifelong education. So, after they leave school, they possess skills for autodidact which ensures that they are becoming smart in adjusting themselves to society to which they belong to and to the era in the years to come. Information and Communication Technology (ICT) is evolving tremendously. Principles of Constructivism prove suitable for the use of the ICT for learning.

Unfortunately, some important stakeholders of education are not familiar with the theory of Constructivism which is the umbrella of cooperative/collaborative teaching techniques. Therefore, teachers, tutors, lecturers, faculty members, deans, rectors, school principals, and educational authorities should understand Constructivism or they had better leave the jobs assigned to them.

REFERENCES

- [1] Ahmad, Syarwan. "Perspective Psikologi Pembelajaran Terhadap Pemanfaatan Internet." *Jurnal Ilmiah Didaktika* 12, no. 1 (2011): 30-31.
- [2] Bednar, Cunningham, Duffy and Perry. "The Theory Into Practice: How Do We Link?" In GJ. Anglin (Ed.). *Instructional Technology: Past, Present, and Future*. Englewood. CO: Libraries Unlimited.
- [3] Brown, Collins and Duguid. "Situated Cognition and the Culture of Learning." *Educational Researcher* 18, no.1 (1989): 32-42.
- [4] Budiningsih, Asri C. *Belajar dan Pembelajaran*. Jakarta: Rineka Cipta, 2012.
- [5] Clancey, W.J. *Review of Winograd and Flores' Understanding Computer and Cognition: A Favorable Interpretation* (STAN-CS-87-1173) (Palo Alto, CA: Department of Computer Science, Stanford University, 1986).
- [6] Ed Online, Thirteen. *Constructivism as a Paradigm for Teaching and Learning*, 2004, Accessed 29 February 2016 from <http://www.thirteen.org/edonline/concept2class/constructivism/index.html>; Internet.
- [7] Hamalik, Oemar. *Kurikulum dan Pembelajaran*. Jakarta, Bumi Aksara, (2012).
- [8] Jen & John Uriarte. *Constructivism and Technology in the Classroom*, 2011, accessed 20 February 2017 from <https://sites.google.com/a/boisestate.edu/edteki/final-synthesis-papers/constructivism-and-technology-in-the-classroom-1>
- [9] Jonassen, D.H. "Evaluating Constructivistic Learning." *Educational Technology* 31, no.9 (1991): 28-33.
- _____. "Objectivism Versus Constructivism: Do We Need a New Philosophical Paradigm?" *Educational Technology Research and Development* 39, no. 3 (1991): 5-14.

- _____. "Thinking Technology: Toward a Constructivist View of Instructional Design." *Educational Technology* 30, no. 9 (1990): 32-34.
- [10] Hall, Richard. H. *Constructivist Theory*, accessed 23 February 2017 from Web.mst.edu/~rhall/ed_psych/constructivism.html
- [11] Mulyasa. *Pengembangan dan Implementasi Kurikulum 2013*. Bandung: Rosdakarya, 2013.
- [12] Omrod, Jeanne E. *Educational Psychology: Developing learners*. 7th ed. New York: Pearson, 2011.
- [13] Sawyer, W.D.M. "The Virtual Computer: A New Paradigm for Educational Computing." *Educational Technology* 32, no. 1 (1992): 7-14.
- [14] Spiro, Feltovich, Jacobson and Coulson. "Cognitive Flexibility, Constructivism and Hypertext: Random Access Instruction for Advance Knowledge Acquisition in Ill-structured Domains." *Educational Technology*, 17 (1991), 129-144.
- [15] Stepich and Newby. "Analogical Instruction within the Information Processing Paradigm: Effective Means to Facilitate Learning." *Instructional Science* 17, no.5 (1988), 129-144.
- [16] West, farmer and Wolf. *Instructional Design: Implications for Cognitive Science*. Englewood Cliffs, NJ: Prentice Hall, 1991.