A Design of Highschool Connectivist Social Studies

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I. INTRODUCTION

With the development of digital information technology, knowledge has more than doubled every 18 months, rapidly spread over the network, and its distribution period is getting shorter. Therefore, not only is internalization of a huge amount of knowledge limited, but because of changing data and information, the knowledge learned would not be always right. As the time changes, Connectivism was emerged by Siemens (2004) and Downes (2005). In terms of Connectivism, knowledge is formed in the process of connecting distributed knowledge with nodes of information by utilizing the network and at the same time linking and interpreting the useful information is seen as the learning.

Connectivism brings about the changes of learning as the result of the development of digital information technology, which is linked to the needs of learners. Through digital technology, learning is already being done throughout everyday life. On the other hand, however, learning is not performing well in the classroom, where active learning is needed. Teachers(instructors) are always struggling to make them engage in the class because students are exposed to too many interesting things through mobile and the Internet. Learners resisted with ignorance and helplessness in classes that are not related to their own fun, career, or advancement, and conflicts occur between teachers and learners. Especially, the reason of this conflict is mobile. Although mobile has been considered an obstacle to learning, interestingly it is the learners ' most preferred communication tool.

Usually in a Korean classroom, homeroom teachers gather the students' cell phones to the collection bag in the morning and distribute to the students after school. At this time, teachers might be the most disliked people by learners because the learner's most disliked is "the person who takes the cell phone away" and "the person who cuts off the wi-fi". It proves the importance of mobile as a means of communication to learners, so mobile needs to be actively used as the learning tools rather than keeping them in the teachers' desk drawer.

In this paper, mobile based class differs from the usual class or cMooc in that the class communicates with not only usual subjects such as teachers, students, and textbooks but also virtual world outside classroom by network.

Four main activities of Connectivism such as connections, relationships, creation, and sharing(Kop, 2011) and formal cooperative learning method(David W. Johnson & Roger T. Johnson, 2017) are used in the class in order to actively participate in class and to implement advanced digital media technologies in the classroom environment.

II. MEANING OF CONNECTIVISM

Connectivism sees a node as a minimum unit can be anything that is linked to another node like information, knowledge is created in the process of connecting the learners' knowledge and information distributed in the external network, and learning occurs(Siemens, 2005a). Therefore, learning is performed in the process of efficiently finding and interpreting the information that the learner needs in the network environment(Siemens, 2011).

1. The principle of connectionism proposed by Siemens.

Connectivism can be seen as a difference from the existing learning theory, which focuses on information connectivity, diversity, and ability to learn more, which can be learned more in the context of problem solving rather than the knowledge that the learner currently has. The principle of connectivism that Siemens(2005) suggests is like below.

· Various opinions are the basis of learning and knowledge.
· The process of linking specialized nodes or sources of information is learning
· Non-human appliances can be the cause of learning.
· Ability to know more is more important than what is currently known.
· Fostering or maintaining connections is necessary to facilitate continuous learning.
· Ability to see connections among fields, ideas, and concepts is a key skill.
· Currency, exact, latest knowledge, is the purpose of all learning activities in connectivism.

· Decision-making itself is a learning process.

Therefore, knowledge is linked to new information in specific situations, and existing knowledge is given new meaning(Ki-bum, Park, 2018). This suggests the characteristics of connectiveism in which knowledge is generated and learning occurs in the process of linking knowledge and distributed information that learners have.

2. Reinforcing principles of connection proposed by Siemens

These days, learners in classroom are more familiar with solving everyday life problems by searching for information distributed on the network using mobile or computer rather than solving them with learned knowledge. However, it is difficult to link these learning methods to learning in the field of education. Siemens presented the following strengthening principles.

· Motivation : First of all, the sense of purpose that learners want to learn makes the process and outcome of solving a task different. Motivation is important to create a deep network connection through accepting a specific concept, refining, and rationalizing in the process of creating nodes from learning and connecting or disconnecting information.

· Emotion : The learner gives value to the node with emotion. Emotion affects other nodes through different processes and network connections for the same node.

· Exposure: Nodes and information can be popular when connected to more nodes. This implies that exposure is important in terms of up-to-date, capacity building and learning by connecting closely with other idea information and quickly joining into the network.

· Patterning: The typology is a structure that allows the learner to approach learning theory. This structure is the process of recognizing knowledge of the type and the nature and organization of information..

· Logic: Logic is the basis of the connection between repetitive nodes and information knowledge and is part of the learning process. The process of thinking involves the organization and structuring of learning networks. It improves the rationality by providing thought and reflection on the connection and disconnection between mechanical nodes and information and knowledge.

· Experience: In the case of network connections (SNS conversations, connections, knowledge and node connections, etc.), much of the learning takes place through informal means. Experience also catalyzes the acquisition of new nodes and the linkage between existing nodes, as well as the enhancement of competence(Siemens, 2005b)

Therefore, it can be used as reinforcing factors(motivation, emotion, exposure, typification, logic, experience) in learning activities by using learner's digital media utilization experience and situations exposed to SNS such as Facebook, Twitter, Kakao Talk and Cloud. This requires a good learning environment and the capacity of the instructor. This is because it enhances the efficiency of learning and reflects the change of education in the times.

III. LEARNING MODEL BASED ON CONNECTIVISM

Tests provided to learners in a changing educational environment must be constantly connected with node information to provide flexible and useful, up-to-date information. Connectivism was emerged as it connects learners with other information by using knowledge as a node of information rather than confining knowledge by internalizing knowledge. It also considers making and interpreting the latest meaningful information needed to learners and generating the knowledge as the process of learning. Therefore, it is also a characteristic of connectivism that the ability to solve problems by organizing the resources that can be utilized by communicating with a group of external advisers using virtual worlds, artificial intelligence, SNS. The learning principle of connetivism applies to online media, cMOOC(Siemens, 2011). The learning activities in cMOOC are summarized in [Figure 1].

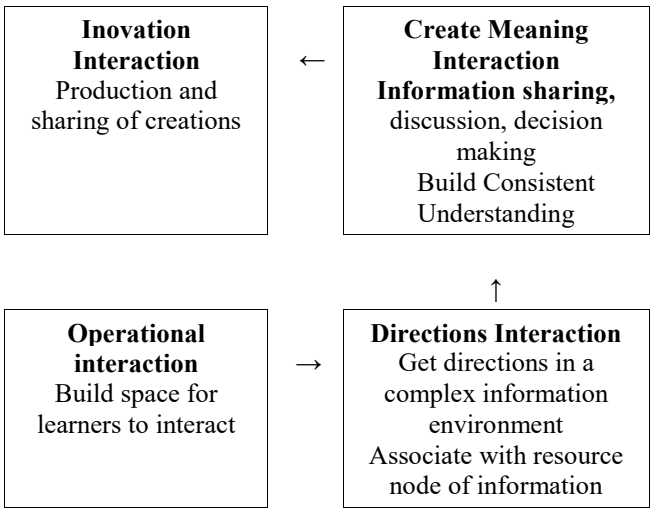
K. Kultawanicha, P. Koraneekija, J. Na-Songkhla (2015)		Kop(2011)	
Learning Activity Step	Contents	Learning Activity Step	Contents
Aggregation	- Find topics of interest - Subject and keyword selection - Perform search strategy - Information collection and management	Aggregation	- Collects (read, report, feel) various(distributed) information and knowledge.

Remixing	- Comparison of information and prior knowledge - Information evaluation - Share with friends	Relation	- Connecting with knowledge obtained through synthesis and prior knowledge and experience(reflection and meaning formation)
Repurposing	- Reading and summarizing important information - Data analysis and synthesis - Create new information - Evaluate and modify	Creation	- Steps to make your own output after reflection and meaning formation
Feed-forward	- Result announcement - Information transfer - Feedback summary	Sharing	- Share the results through the network.

[Figure 1] Main Learning Activities of Connectivism

The learning activity step in [Figure 1] uses communication tools(SNS, Cloud) in the online learning environment to select topics of interest and to collect subject-related information by selecting topic-related keywords. Next step is comparing the learner's knowledge with collected information, and evaluating and sharing that information with friends. The usage of knowledge acquired through the process of synthesizing or finding new values with learners' knowledge changes. Finally, the learning process is finished by sharing the results and receiving feedback. The other learning activity steps of kop(2011) are more meaningful than information usefulness obtained in the relationship setting stage, giving meaning to reflection and meaning formation and creating new results rather than changing the use in the creation stage.

Learning activities in [Figure 1] are, of course, all these activities done online. In this part, the question that the learners are actively involved is remained. The online learning environment has difficulties in active participation and evaluation of learners. In particular, lack of interaction may lead to a decrease in learners' participation, which can significantly reduce the effectiveness of learning. In order to solve this problem, as shown in [Figure 2], the problem is solved through the connectivism interaction and the learner's high level of cognitive participation is induced.



[Figure 2] Connectivism Interaction (Wang, Chen, Anderson, 2014)

Based on the above four activities and interactions, the courses actually operated by cMOOC are applied to CCK11, DLMOOC, PLEK12, and so on.

IV. MOBILE BASED TEACHING AND LEARNING DESIGN OF SOCIAL STUDIES APPLYING CONNECTIVISM

The learning theory of connetivism will be designed to adjust classroom environment in this paper. There are reasons why this type of learning is devised. First, most of the learners are in the classroom. Second, at least most students in classroom are not voluntarily participated in class and require teacher's assistance because they are inexperienced in learning. Third, although there are excellent Internet and mobile environment, it is not familiar with learning applying connectivism and also requires appropriate practice. Fourth, if the learners do not have the proper learning environment required of connectivism, they need to use the classroom adapting the environment of cnnectivism. Finally, the learner needs to grow through interaction between the teacher (the instructor) and the learner, and positive encouragement among the members. In order to realize the class applying cnnectivism, the model and evaluation criteria of the social studies class based on connectivism was designed in [Figure 3] and [Figure 4].

The difference between the design of cMOOC classes is like these: First, based on the classroom lessons, the learning and activity of connecting, integrating, creating, and sharing the connecting and disconnecting of nodes and information are continuous learning activity both inside and outside the classroom. Second, it differs from personal learning in that it seeks collaborative learning through interdependent learning activities such as connecting and communicating with members in the classroom

and sharing and creating. The roles of teachers and the principles of teaching are as follows.

1. The Role of the Teacher

At the education field, the teachers protect the autonomy of the students and participation should be encouraged within the permissible scope of the curriculum. Second, classes should be designed to reach the curricular goals while ensuring autonomy. Third, based on collaborative learning, a team (personnel, role, and position) should be organized to improve learning efficiency. Fourth, the learner should be instructed to acquire the concepts and principles of the teaching method. Fifth, learning activities should be monitored from time to time and, if necessary, teachers give learners appropriate intervention to facilitate cooperation with classroom groups and external networks. Sixth, evaluation should be based on clear goals for achievement goals and activities of the learner.

It is important that the teacher based on Connectivism plays a role of facilitator of the teacher at the beginning of the semester as the mobile which is familiar to learners is based on the unfamiliar Connectivism theory. Although there are many intervention factors in the beginning, the learner can be actively changed if the learner gets used to the method in the class.

2. Composition Principles of Classes

In order to construct a class, it is necessary to understand the achievement goals and evaluation of the curriculum and the environment in which the class can be conducted. In addition, the characteristics of each subject should be constructed considering the class. Accordingly, we will construct the following principles. First, the goal of the class is to let the learner actively participate in the goals that the class presented in the curriculum. Second, the standard time for class design is 3 hours. The average weekly class time is 3 to 5 hours, which is appropriate for 3 hours considering continuity, efficiency, and progress. Third, a week to two at the beginning of the semester will be spent in the class of connectivism to practice the method. Fourth, it teaches students to use their mobile and tablet devices in class. Fifth, assess students' activities and outcomes in the class with clear criteria.

Learning activity	Contents of the lesson	
Investigation and Composition of digital class environment	- Identify students' digital foundations and abilities early in the semester. - Creating a class environment applying connectivism based on learners' digital foundation and ability Ex) SNS, blog, group chatting room on mobile, etc. - Learner training on the way of teaching	Learner analysis - Educational environment analysis (Takes 1 or 2 weeks)
↓		
Aggregation	Textbook : Recognizing(presenting) learning objectives(tasks) of each unit	- For integrated Social Studies, design the unit focused on task solving
	Keyword extensions based on learning objectives(textbooks) - Keyword extensions through search and discussion - Data collection based on expanded keywords	-White board(classroom) - Sharing and expanding keywords using SNS conversations and blogs - Internet search and data collection through out-of-class and SNS communication
↓		
Relation	Interpretation of data and giving meaning(reflection) - Establish relationships with collected data by keyword, experience, learner's knowledge nodes, and give meaning and reflection to the data	- Record the data collected in the workbook and the contents of interpretation and reflection. - End of first class
↓		
Shanring	Sharing collected data with individuals or groups(group presentation) - Sharing in the classroom, sharing outside the classroom Ex) Classroom announcements, SNS communication Utilizing video phone calls, Posting opinions on Facebook, etc.	- Sharing opinions through Out-of-class, virtual space, and SNS between 1st and 2nd

		class 2nd class - Collected data through SNS communication Sharing - Assessment test (applied to performance test)
↓		
Creation	- Summarize and analyze the collected data to synthesize the contents of the reflection with your knowledge or create new knowledge - Internalization of learning methods during the synthesis or creation of knowledge.	- Record the process and outcome - Assessment test - Complete tasks (reflected on the performance test)
↓		
Shanring	- Sharing creation results. - Conclude the content into individual or group studies for various interpretations. - Receive feedback from inside and outside the classroom through sharing. - Comparative assessment of achievement objectives and outcomes in the curriculum -Record the contents of individual and group processes and results	3rd lesson - To assess the formation of a learning process

[Figure-3] High School Class (Social Studies) Design Model Using Connectivism

Subject	**Society (history, general society, geography, ethics, integrated society)**		
Evaluation target Evaluation class			
Evaluation type	Written evaluation	Performance assessment	Sum

A reflection rate	70%		30%		
Evaluation area	First Written evaluation	Second Written evaluation	Essay evaluation	Class Activities (Connectivity)	100 %
By area A reflection rate	35%	35%	20%	10%	
A perfect score	100points	100points	20points	10points	100 points
Final calculation score	35points	35points			
Descriptive . An essay form A reflection rate					
Descriptive reflection rate (A perfect score)	7.7%(22points)	7.7%(22points)	0	0	45.4 %
The ratio of essay reflection	0	0	20%	10%	
The ratio of essay reflection					

[Figure 4] Evaluation plan for high school class (social studies) using Connectivism

		Evaluation Criteria	points
Evaluation Criteria	Comprehensive ability (3points)	Nodes and keywords were collected and selected by various tools in relation to learning (topic) goal recognition, and were highly evaluated by classroom members and sns.	3
		In terms of learning (topic) goal recognition, we used a variety of tools to collect and select nodes and keywords, and received low ratings from classroom members and sns.	2
		In the learning (subject) goal recognition, nodes and keywords were collected and selected using various tools, and there were insufficient data collected and collected by the class members and sns.	1
	Creativity (2points)	Throughout the process of synthesis, relationship, and sharing, we created creative outcomes.	2
		Participation in the process of synthesis, relationship, and sharing is insufficient and the outcome is poor.	1
	relation (3points)	He gained a high degree of completeness from the members of the classroom by linking his experiences and prior knowledge with acquired information and knowledge.	3
		He has received less evaluation from the members of the classroom by linking his experience and prior knowledge with acquired information and knowledge.	2
		He failed to link his experience and prior knowledge with the information and knowledge he had gained.	1
	share (Use for network) (2points)	The results were actively shared within the classroom and through external networks. (Confirmed through the record of the workbook and the sns record)	2
		The results could not be shared within the classroom and through the external network. (Confirmed through the record of the workbook)	1
		If you only submit	2

[Figure 5] Connectivism class activity evaluation criteria

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