Seamless flipped learning :
a mobile technology-enhanced flipped classroom with effective learning strategies

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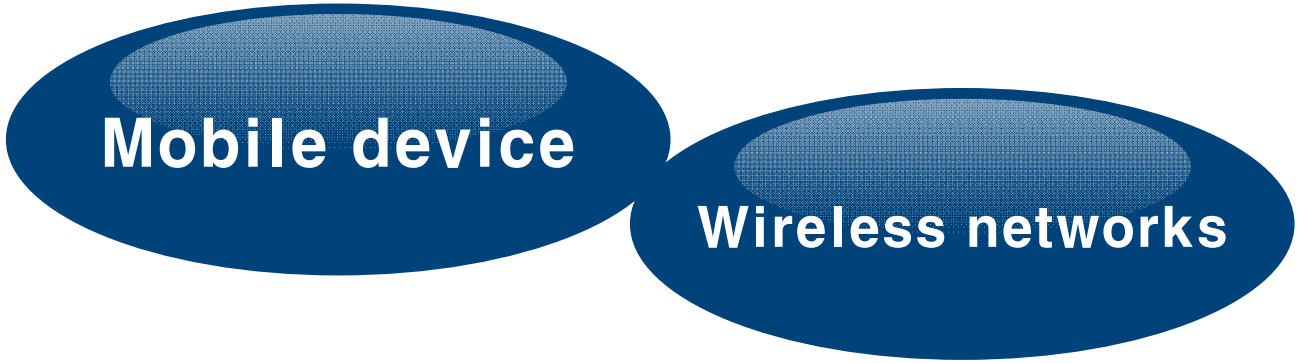
연구의 필요성

The challenges of applying flipped classroom to school settings have been pointed out.

- The need for effective in class learning designs
- The necessity of helping students learn across at home and in school contexts.

"it is necessary to further investigate and define design specifications that **integrate technology into flipped classrooms** (Kim at al, 2014)."

Seamless learning



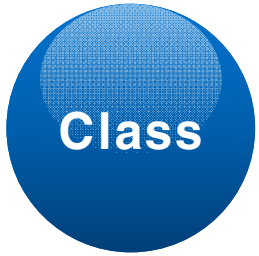
"learning across contexts seamlessly"

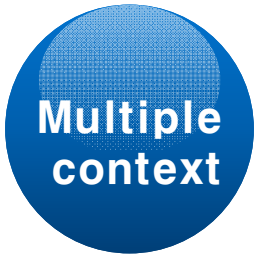
Extending students' learning space
from home and school to their daily-life contexts.

Seamless flipped learning

Seamless flipped learning

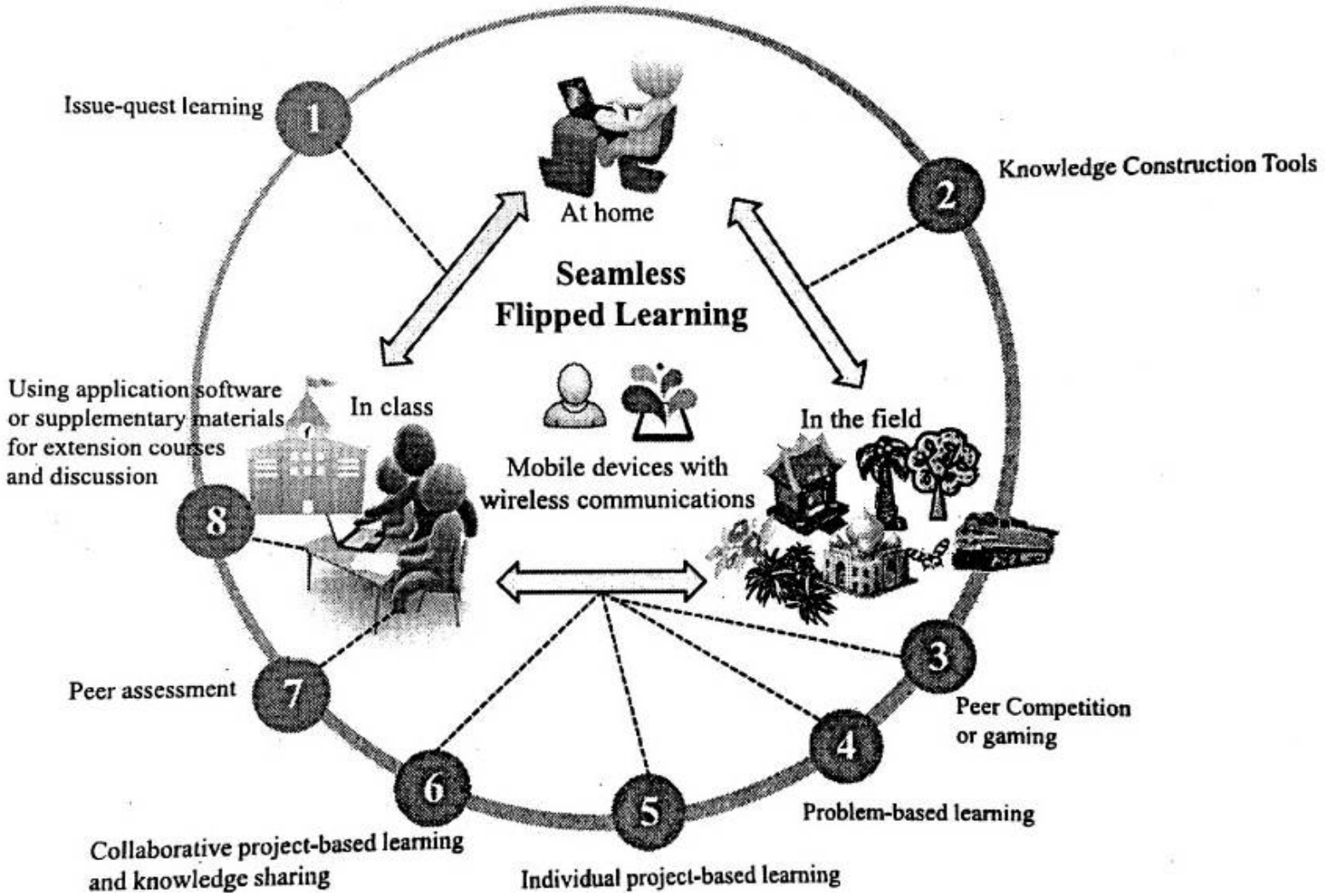
The extension of flipped learning via **using mobile and wireless** communication technologies to **seamlessly connect at-home learning, in-class activities, and in-field learning**





Multiple contexts
: physical and social spaces

Notation of Seamless flipped learning



[그림 1] Notation of seamless flipped learning

Seamless flipped learning principles

- **집에서 자기주도적 학습(self-learning)에 참여하도록 하라**
  – memorizing and comprehending levels.

- **배운 것을 실제 상황에 적용하고 일상 생활에서 정보를 수집할 수 있도록 현장 학습 활동을 설계하라**

- **교실 안에서 학습자가 강의 동영상에서 배운 지식과 현장(일상 생활)에서 수집하고 관찰한 것을 기반으로 고차적 사고를 촉진할 수 있는 활동을 설계하라**

- **학습 공간에서 학습자 – 학습자 그리고 학습자 – 교사의 상호작용을 촉진하라**

- **집에서의 자기주도 학습과 현장에서의 탐구 및 적용, 교실 안에서의 고차적 사고 활동, 학습자와 학습자/ 교수자 간의 상호작용을 연결하기 위하여 Mobile 그리고 wireless communication technologies 를 사용하라**

Issue-quest learning

Issue-quest learning

: The teacher selects issue related to the learning content and lets students discuss and raise questions according to that issue

교사가 사전에 issue에 대한 Supplementary information을 제공하기,
학생은 issue에 대한 정보와 증거를 인터넷 또는 실생활에서 수집하여
교실 활동을 준비. 교실에서는 issue에 대하여 토론(discussion)

Application and discussion of knowledge construction tools

Application and discussion of knowledge construction tools

: Knowledge construction tools or Mindtools assist students to construct and organize knowledge and to develop critical thinking Ex) Concept maps , Expert systems

Ex) 집에서 "나비의 생태계"에 대한 비디오로 학습.

현장(Field)에서 "나비"를 관찰한 후, 이를 학습 컨텐츠와 연결하여

concept maps 제작.

Concept maps를 교실에 가져와서, 동료와 토론(discussion)

Using application software or supplementary materials for extension courses and discussion

Extension course learning
: providing students with application software(educational systems) or additional sources (educational websites)

Application soft ware 이 학생들이 knowledge를 습득하는데 돕고, course content와 real-world context를 연결하는 것이 중요

Ex) Google Sky Map

지구 과학을 가르칠 때, 교실 밖에서 비디오를 통해 knowledg를 습득함.

교실 안에서 mobile application을 활용하여 google sky map을 통해 하늘을 관찰하며 학습 활동 진행

Problem-based learning

Problem-based learning

The purpose of learning activities is not to provide the answers to the problems, but rather is **a process of finding the solution to the problems.**

교사는 제공하는 learning contents가 답을 찾기에 적절한지, 학습자가 찾은 정보에 기반하여 다른 답을 찾을 수 있도록 하는지 이해할 필요가 있음

교사는 교실 밖에서 비디오와 함께 실제적인 문제를 제공.

학생들은 관련 자료를 실제 현장에서 모으고, web을 통해 검색해봄.

교실에서 학생들은 팀원들끼리 problems에 대한 가능한 solutions을 도출.

project-based learning

Individual project-based learning

The purpose of the learning activities is to complete a project product

교사는 mission에 대한 difficulty(난이도)와 complexity(복잡성)에 대해 고려해야 할 필요가 있음

Ex) vocabulary

교실 밖에서 비디오를 시청함으로써 새로운 vocabulary를 익힘

실제 현장에서 vocabulary를 활용하여 짧은 에세이를 쓰거나 비디오를 제작

교실 안에서 공유

project-based learning

collaborative project-based learning and knowledge sharing

The purpose of the learning activities is to complete a project product

교사는 mission에 대한 difficulty(난이도)와 complexity(복잡성)에 대해 고려해야 할 필요가 있음

Ex) living environment and plan a field trip

교실 밖에서 "지리"에 대한 비디오를 시청.

교실 안에서 팀 멤버끼리 project를 수행하기 위한 토론 discussion

이후 교실 밖에서 실제 현장답사(field trip)실행하여 mobile 기기를 통해 사진 촬영 및 비디오 촬영 후, 교실 안에서 산출물을 다른 동료 학습자/ 교사와 공유

Peer assessment / Peer competition or gaming

Peer assessment

By Peer assessment, students can understand the teacher's point of grading and hence reflect on their work.

Teacher give students rubrics.

- Reflect , scores
- After receiving the ratings and comments from peers the students need to collect more data in the field and discuss more in the class.

Peer competition or gaming

Seamless flipped learning

In a seamless flipped learning environment, **mobile devices** and **wireless communication** facilitate the continuous **flow of learning in different contexts,** physical and social spaces.

Potential research issues of seamless flipped learning

- how can we foster **students' self-learning ability** such that they can benefit from the seamless flipped learning activities ?
- How do we employ **emerging technologies such as augmented reality** to facilitate seamless flipped learning?
- What are the **new digital-divide and equity issues** when seamless flipped learning has been widely implemented in school setting?

Hwang, G. J., Lai, C. L., & Wang, S. Y. (2015). Seamless flipped learning: a mobile technology-enhanced flipped classroom with effective learning strategies. Journal of Computers in Education, 2(4), 449-473.

Kim, M. K., Kim, S. M., Khera, O., & Getman, J. (2014). The experience of three flipped classrooms in an urban university: an exploration of design principles. The Internet and Higher Education, 22, 37-50.