

# Development of a Data-Oriented e-Learning Platform Based on the Community of Inquiry Framework

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**ABSTRACT:** Community of inquiry framework has received increasing popularity in e-learning related studies in the past decade. In this prototype report, we present a data-oriented e-learning platform based on the community of inquiry framework. The main functions include student grouping, assignment creation, activity digest and student notifications, which are all essential steps to build and maintain an online community of inquiry. By utilizing students' background information and their learning behavioral data, the platform generates insights to inform teachers on the effectiveness of learning design and implementation.

**Keywords:** Community of inquiry, collaborative problem-solving, learning communities

## 1 INTRODUCTION

Effective learning experiences require learners to actively and collaboratively engage in exploring, creating meaning and confirming understanding. Such requirements are best represented in the community of inquiry framework. As depicted in Figure 1, this framework consists of three essential elements: social, cognitive, and teaching presence. It is at the intersection of all the three presences where students achieve meaningful educational experiences.

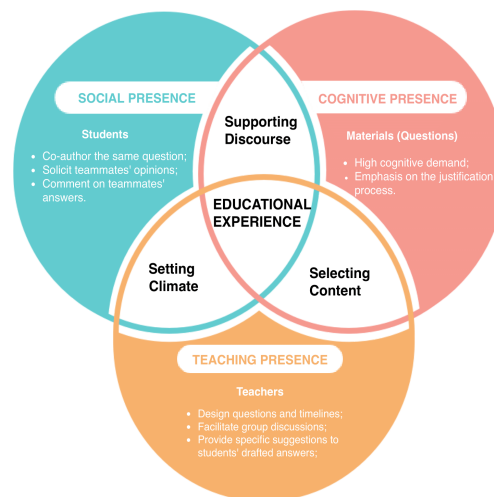


Figure 1: The community of inquiry framework

Based on the three requirements, several detailed specifications can be elicited and should be satisfied to ensure the online communities of inquiry are effective. Specifically, social presence is achieved through collaborative problem-solving and discussions; cognitive presence depends on the design of high cognitive demand tasks; and teaching presence can be realised through clear instructions, in-time support, and individual feedback. Considering these specific requirements, we designed a data-oriented platform that integrates all requirements into the activity design process.

## 2 PLATFORM DESIGN

The platform is designed to construct online communities of inquiry with collaborative editing documents (e.g., Google Docs). Compared to online discussion forums which are commonly used for online community building, collaborative documents offer more editing features, and could enhance group cohesion. The activity is group-based rather than in a whole-class setting, so each member has the opportunity and responsibility to contribute. The following elaborates on the main steps of designing activities using the platform.

- **Grouping:** As the foundation of social presence, grouping of students could be a daunting task when the class size is large and student body is diverse. The platform offers several parameters to enable teachers to group students with different strategies: maximizing or minimizing diversity, grouping based on their gender, major, year of study, etc.
- **Assignment Creation:** To satisfy the cognitive presence requirement, it is recommended to design high cognitive demand open-ended questions to facilitate the building of communities of inquiry. Using the assignment creation function shown in Figure 2(a), teachers only need to input the questions, and the platform will automatically generate collaborative editing documents for each student group and distribute the documents to their members.
- **Activity Digest:** Teaching presence requires in-time support and feedback, which can be very challenging to implement in large sized classes. The activity digest function offers a summary table of each group's progress and interaction level as shown in Figure 2(b). With such report, teachers can visualize the groups' performances, and over time, observe students' learning patterns and provide targeted intervention.
- **Student Notifications:** With the activity digest report, teachers can target groups or individuals to intervene with, and provide in-time support and feedback. Specifically, by allowing teachers to customize the parameter of idle students/ groups, as demonstrated in Figure 2(c), the platform can send reminders and follow up emails with personalized messages automatically to bring inactive students back on track.

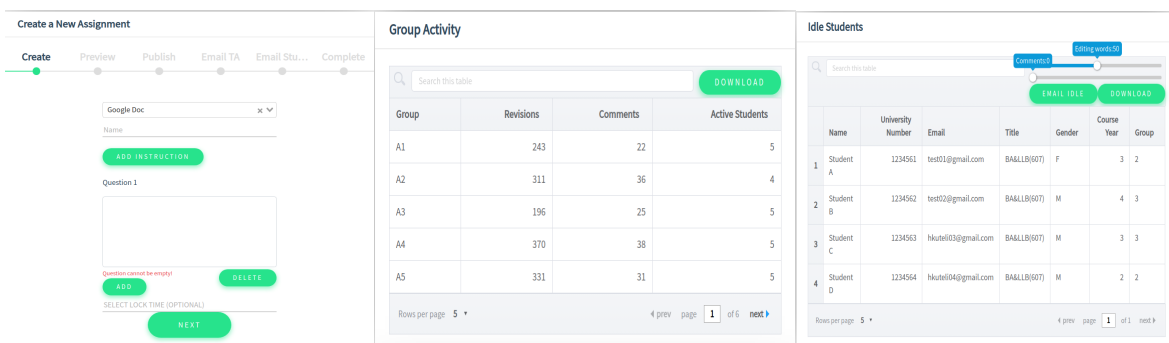


Figure 2: Screenshots of the platform

(a) Assignment Creation (b) Activity Digest (c) Student Notifications

## REFERENCES

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