Development and Verification of User-Behavior Collection System for Flipped Classroom

Shintaro UCHIYAMA (Leading Graduate School; Dept. of Comp. Sci. and Eng., Toyohashi Univ. of Tech.)

Preparation Learning needs to be assisted appropriately!

Educational Technology

Education Technology Sociology Pedagogy Engineering Informatics Psychology **Learning Science** Electronics Cognitive Science Computer Science And more.

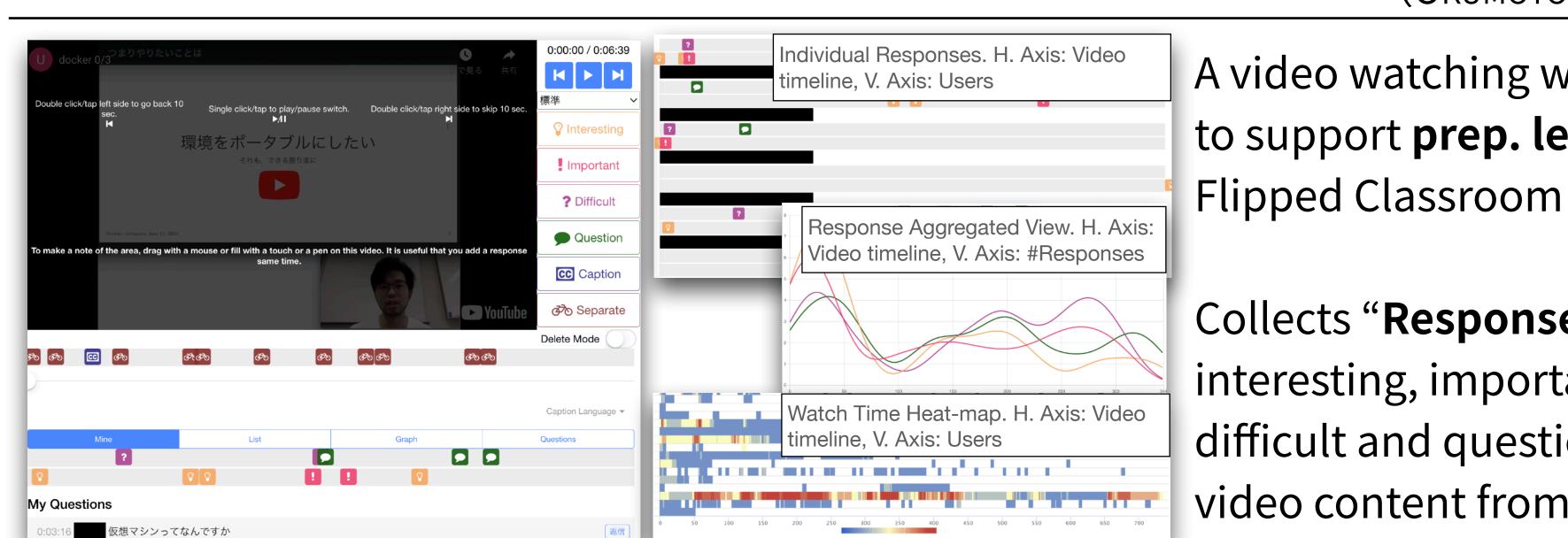
An interdisciplinary field to make education better using technologies

Response Collector (RC)

A video watching web-system to support **prep. learning** in

(Окимото et al. 2018)

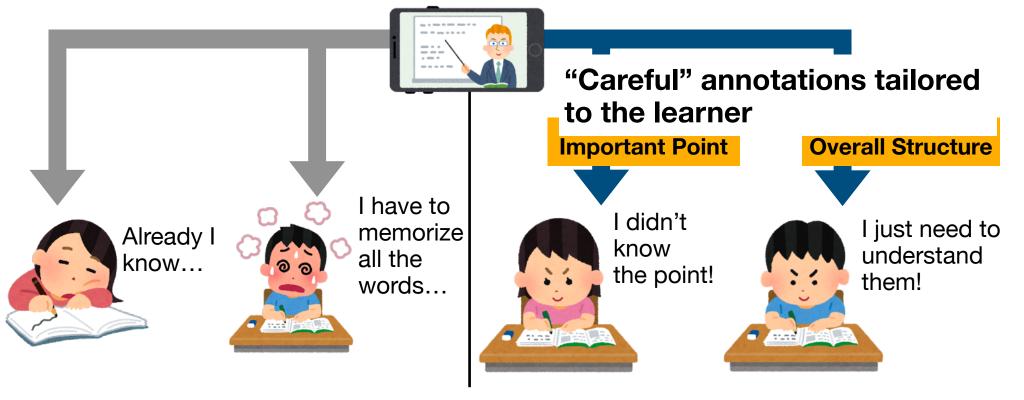
Collects "Responses" such as interesting, important, difficult and question for video content from students



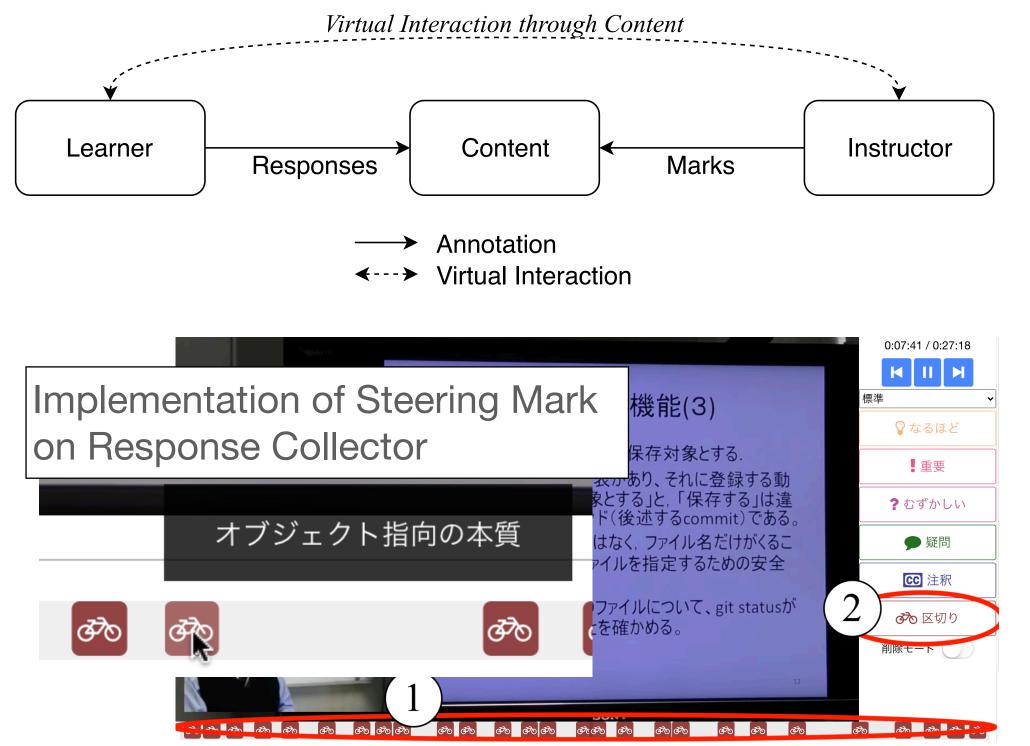
Objective Making Flipped Classroom preparation learning more effective but easier for both students and teachers

Steering Mark: Annotations from Teacher

(Uchiyama et al. 2022)

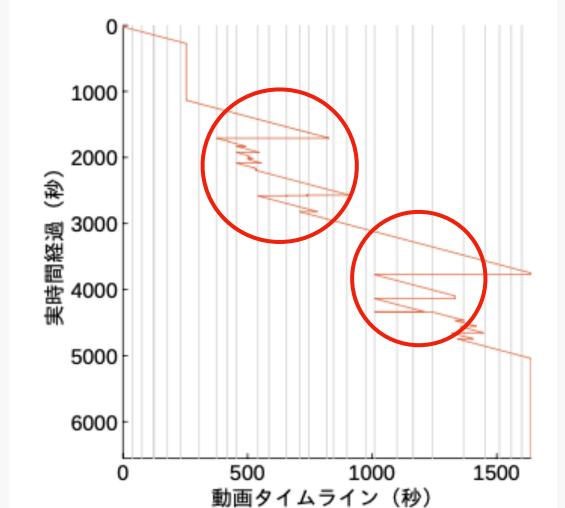


Need methods to support individualized optimal learning, especially Personalization of learning



Verification of proposed method

Hypothesized if the method works as expected, behavior of students is affected



V. Line shows where Steering Marks put

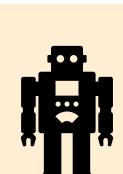
A student watch the video according to the mark

→ Hypothesis verified

(UCHIYAMA et al. 2023)

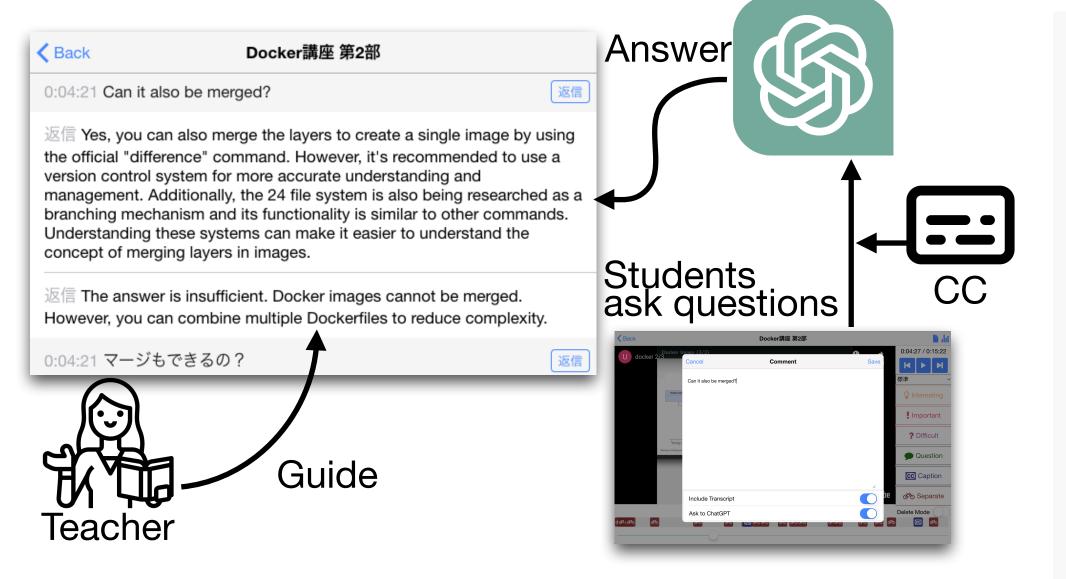
Use of LLMs

RC has a function to put questions on videos, but who can answer them immediately?



Let Generative Al answer

Use ChatGPT to answer the questions Apply a method to avoid unrelated answers



Proposed System. RC is extended to get the answer from ChatGPT.

Prompt Engineering

Including CC with the questions into a prompt makes the answers relative to the context

Actual Prompt \n indicates a line break

{ "model":"gpt-3.5-turbo", "messages": [{"role":"system","content":"あなたは良き教師で す. ユーザは教材を見ながら、その教材に対する質問を入力します. 教材の字 幕を与えた場合は、それを考慮してください. ユーザーの反応に対して、教師は ユーザーに考えを促す返答をします.直接答えを教えてはいけません."},

{"role":"user","content":"###動画の字幕"}, {"role":"user","content":"\nなんて 言って たか\n\n見てみればいいじゃん。\n\n\n\nさて 台風は どうなったかな?(...中 略…)予報円のさ 丸があったでしょ。\n\n\n\n風が 強い所は\n\n \n\n\n\nもっ と広くまで\n\n広がるかもしれないよ。\n"},

{"role":"user","content":"###質問"}, {"role":"user","content":"大きかったり小さかっ たりするのはなんで?"}]}

Future Work



Continue practices

Now our next research is working in progress on my part time lecture. Practices will give us important insight.



Multiple Supervisors

It's great to receive advices from different perspectives. But should be careful for "To many cooks spoils the broth"

My Opinions on Interdisciplinarity



Feeling of Missing Expertise

Feel "isn't it lukewarm?" sometimes Hard to find people for casual discussions Hard to keep my mind



Make use of the log data easier

Our practices in various school revealed the use of the data is a bit difficult for teachers. Also we need integration with common LMS.



Practice for Reasoning

Good opportunity to think about reasons why I research this topics because they are not obviously given by someone.

Should we do it for diploma?

Why interdisciplinary field is called so? In my opinion, because it is relatively new field so that students have to be more patient.