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Presentation Scenario Design Support System That Prompts Awareness of Other Viewpoints

Kazumi MASAKADO*, Yuki HAYASHI & Kazuhisa SETA
Graduate School of Humanities and Sustainable System Sciences, Osaka Prefecture University, Japan
*masakado@ksm.kis.osakafu-u.ac.jp

Abstract: Even when a learner (novice researcher) has thoroughly reviewed their presentation materials, it is not uncommon for others (experts) to find that there is still room for improvement. This is commonly because learners do not sufficiently engage in metacognitive activities such as reviewing their thoughts or shaping their knowledge from other viewpoints. Therefore, in this study, we focus on using the task of creating presentation materials as an opportunity to promote awareness of other viewpoints, and we propose an information system mechanism that gives advice on how to correct and improve presentation materials based on audience models and presentation scenarios.

Keywords: Presentation scenario, cognitive conflict, awareness of other viewpoint

1. Introduction

In this study, we examine how learning support systems can help prepare presentation scenarios that facilitate meaningful knowledge creation opportunities, and we examine the required functions to achieve this. For example, when making a presentation for a research topic, it is not always easy for learners (novice researchers) to state their research topic academically and prepare presentation materials that clearly express the value and content of the topic to the audience. In such situations, the learner gets help from research collaborators (e.g., seniors, peers, professors, etc.) to resolve possible issues and create sophisticated presentation materials in a trial-and-error way.

So far, several studies have proposed the learning support system that promotes the quality of learners' presentation scenarios based on general presentation structures. For example, Tanida, Hasegawa, & Kashihara (2008) proposed a method to encourage planning and reflecting on the presentation document by explicitly assigning the presentation structure to the learner's own slides. The presentation structure is systematized based on typical presentation structures used in presentation materials created in the laboratory, such as 'outline,' 'research objectives,' and 'approach.' Kojiri, & Watanabe (2016) proposed a learning support system to organize the presentation contents by annotating a specific topic to each content. The topic model used in the system consists of the logical relationships among the typical presentation components, such as 'problem,' 'purpose,' and 'method.' While these approaches help learners to understand the logical structure of their presentation contents rather general, research context independent level, they do not give advice from audience's viewpoints capturing learners' research content to help examination of the presentation scenario.

Generally, presentation design activities can be difficult due to the complex tasks required and the fact that the processes for handling them cannot be specified (i.e., ill-defined problem) (Jonassen, 1997). Therefore, the goal of this study is to examine how to transition presentation preparation efforts (including discussions) from confusing and ad-hoc, as pointed out by Hollnagel (1996), to strategic and knowledge-creating.

2. Presentation Scenario Design Support System

We developed a support system for presentation scenario design that cooperates with the "Forest" internal conversation support system developed by Mori et al. (2019). Figure 1 shows our system

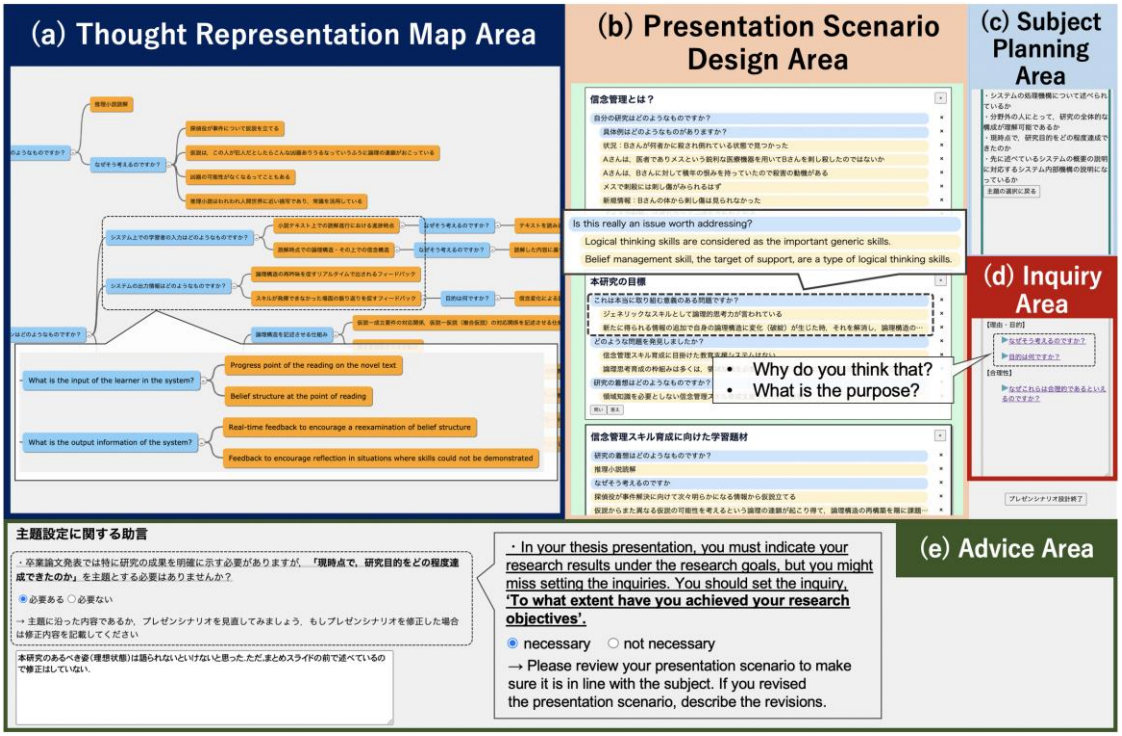

Figure 1. Presentation Scenario Design Support System.

implemented as a web application. The system consists of a (a) thought representation map area, a (b) presentation scenario design area, a (c) subject planning area, an (d) inquiry area, and an (e) advice area.

In their daily research activities, learners organize their research content as a (a) thought representation map using the Forest. In the Forest, learners externalize their thoughts as a chain of questions and answers (pyramidal structure (Minto, 2009)) and organize their thoughts by engaging in internal conversation. Learners can select and place blue inquiry nodes from the (d) inquiry area.

In the presentation design activity, learners should consider the audience and dig deeper into issues that should be focused on according to the subject. To promote this activity, learners can show the (b) presentation scenario design area and (c) subject planning area, when designing a presentation. In the subject planning area, the audience's viewpoints (e.g., "Is the academic significance mentioned" and "Is the technical background mentioned") are presented so learners can consciously select the subjects to be mentioned in the presentation. Learners specify the corresponding content of each frame for each slide as a question and answer structure to be conveyed to the audience. If new inquiries (i.e., cognitive conflicts) arise during this process, learners can reflect them in the thought representation map and reconstruct them to examine their answers, thereby resolving cognitive conflicts.

When learners judge they could have designed a well-thought-out presentation, the system generates advice based on other viewpoints in response to requests from the learner. The learners' judgments of the decision-making about the advice (i.e., whether the learner reflects the advice or not with the reason) and the content reflected in the presentation scenario are recorded in a log file that can be used for discussion with their supervisors.

3. Case Study: Practical Use in Presentation Scenario Design Activity

Our system has been used in authentic activity to make presentation scenarios for bachelor and master theses to confirm whether our system promotes awareness of other viewpoints, helps reconstruct thoughts, and facilitates knowledge-creating discussions with supervisors. Five students in our laboratory (four undergraduates and one master student) have used the system in practice.

In the scenario design process, the learner added many new inquiries and answers in the thought expression map, indicating that he delved into the subjects focused on in the scenario. Interactions with the system (i.e., advice given by the system and the learner's explicit judgments on it) were as follows:

(1) **Advice given about reexamining the subjects of the presentation scenario:** The system advised, "*In your master thesis presentation, you must indicate your research results under the research*

goals and set the inquiries. You should set the inquiry, 'To what extent have you achieved your research objectives set for this presentation."

Learner's judgment: The learner selected "*necessary*" and stated, "*I thought I should show the concrete image of our research when we achieve our research goal. Nevertheless, I did not modify it because I mentioned it in the slide entitled 'Concluding remarks."*

(2) **Advice given about reexamining the presentation scenario:** The system advised, "*The inquiry, 'What are your future tasks?' should be included and answered by considering the inquiry, 'To what extent have you achieved your research objectives set for this presentation' You should review this based on your research objectives.*"

Learner's judgment: The learner selected "*Do not review*" and stated the reason as "*Already described.*"

(3) **Advice given about reflecting on the learner's judgment process to increase readiness for discussion:** The system asked, "*What did you learn at this time?*" and showed the following decision-making process: *"You judged it necessary to respond to, 'In your master thesis presentation, you must indicate your research results under the research goals and set the inquiries. You should set the inquiry, 'To what extent have you achieved your research objectives set for this presentation' Then, you revised Frame No. 12 entitled 'Concluding remarks,' adding the inquiry, 'To what extent have you achieved the research objectives set for this presentation' and mentioning, 'I added an explanation of the experiment results consistent with the purpose of the research."*

Learner's answer: The learner stated, "*I realized that I had not been aware that the current status and my research results were not clearly stated, which is required in a master thesis presentation.*"

After finishing learners' scenario design process, they discussed their designed presentation scenarios with their supervisors by referring to their decision-making log described above. According to the questionnaire survey conducted after the discussion, learners found the system quite helpful in preparing for their discussions. Some example responses were: "The system pointed out what was missing or what I had forgotten should be embodied in my presentation scenario, so I was able to add the topic to the agenda for discussion." Although there have been only five case studies, we feel the system encourages the recognition of other's viewpoints and helps prepare meaningful opportunities for collaborative knowledge-building.

4. Conclusion

We developed a system that promotes knowledge-building in research presentations through learner tasks such as organizing research content in a thought expression map and designing a presentation scenario using the thought representation map. The practical study suggests that the presentation scenario design using the system encouraged creative knowledge-building discussions.

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