

Using Posting Templates for Enhancing Students' Argumentative Elaborations in Learning Villages

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Abstract

Learning Villages (LV) is a game-based computer-supported collaborative learning (CSCL) platform, which facilitates students' issue-based discussion in a massively multiplayer gaming environment to attain the goal of argumentative knowledge construction. However, such construction can be achieved only if students can make argumentative elaborations properly in order to benefit from CSCL. This paper discusses our research on the use of posting templates to enhance students' argumentative elaborations in LV. Seventy-four fifth-grade students and two of their teachers from two Hong Kong elementary schools participated in the present study. Results confirm that posting templates, to a certain extent, could assist the students in constructing arguments containing reasons and grounds to rationalize and warrant these arguments. In addition to the provision of the posting templates, we also found students' face-to-face peer-sharing (facilitated by the teachers) could help them reach and sustain a relatively higher level of attainment of argumentative knowledge construction.

1. Introduction

Sustaining spontaneous players' engagement [1] and exploiting proactive players' communities [2] are substantive features of today's computer games. This emerging attention has been one of the main reasons for the increasing number of educators and researchers worldwide who treat game-based learning as a topic of serious research in the field of education. For instance,

Squire [3] studied how to integrate a prevalent commercial game, Civilization III¹, into US high-school classrooms. Instead of utilizing existing commercial games, Shaffer [4], together with his research team, developed a number of self-directed epistemic games for situated learning [5]. Those games engage students in participating in various professional communities, so that they can gain first-hand experience in how members of these professions contemplate and deliberate, behave, and solve problems. Jong et al. [6] proposed the VISOLE (*Virtual Interactive Student-Oriented Learning Environment*) pedagogy for empowering game-based situated learning, in which they advocated specific teaching and learning roles and tasks for teachers and students. Ip et al. [7] study propose and study the effectiveness of a CSCL style discussion environment embedded in a massive multiplayer online game.

1.1. Game-based CSCL

CSCL refers to the process of a group of students engaging in discussing their perspectives on a problem with the goal of knowledge acquisition through a computer-based communicative platform operated in an asynchronous fashion [8]. Success of a group is attributed to all group members rather than merely the group leader [9]. Each member is responsible for knowing what needs to be known, and ensuring others to know the same.

¹ <http://www.civ3.com/> (Retrieved on June 20, 2008)

A common critique of some existing CSCL platforms is that their “appearance” and “functions” are just similar to many traditional online text-based discussion boards. Empirical evidence (e.g., [10, 11]) has shown that this kind of platforms fails to promote and encourage students’ proactive participation in CSCL activities effectively. One of the primary aims of the research and development of *Learning Villages*² [7] (*hereafter refers as LV*) has been to address this issue. LV is a massively multiplayer online game (*MMORPG*) to facilitate a 2-tier issue-based discussion in a CSCL platform. A more detailed description of LV is covered in Section 2.

1.2. Argumentative knowledge construction

One of the foci of CSCL research has been on the facilitation of the process of *argumentative knowledge construction*. Weinberger and Fischer [8] observed that argumentative knowledge construction can be achieved through CSCL when a group of students elaborates and exchanges arguments on an open-ended issue, by collecting and balancing evidence and counterevidence properly through discourse. Weinberger and Fischer constructed a theoretical framework for analyzing how students structure arguments in CSCL, regarding the relationships between specific components of arguments. This framework has suggested that four categories of argumentative elaborations are often found in CSCL’s discourse, namely, *simple claims*, *qualified claims*, *qualified and grounded claims*, as well as *non-argumentative moves*.

However, Stegmann et al.’s [12] empirical study has shown that students usually have difficulties in composing arguments in CSCL. For example, their argumentative elaborations often lack supporting data and evidence. This finding coincides with Kuhn et al.’s [13] assertion that the quality of the argumentative knowledge construction without suitable support is insufficient. Stegmann et al. argued that, in order to facilitate the outcome of argumentative knowledge construction, intervention is needed to support students in making argumentative elaborations properly. They advocated for the provision of some sorts of prototypical elaboration scripts (“*script components*” in Stegmann et al.’s term; “*posting templates*” in the present study) pre-implemented in CSCL platforms, so as to assist students in formulating and structuring their arguments in a right way.

² <http://www.learningvillages.com/> (Retrieved on June 20, 2008)

1.3. Aims of the present study

Even if students are motivated to pursue CSCL in LV, there is no guarantee of success in their argumentative knowledge construction. Students need to compose arguments appropriately in order to benefit from the collaborative learning process. This study aims to echo Stegmann et al.’s [12] proposition, and to investigate how posting templates can facilitate elementary fifth-grade students’ argumentative elaborations in LV. We address two specific research questions: (a) *How do students’ argumentative elaborations in LV change in accordance with the provision of posting templates?* (b) *Is the effect sustainable on students’ argumentative elaborations?*

2. Learning Villages

LV [7] is a game-based CSCL platform that operates in a form of massively multiplayer online gaming, in which each student can design his/her own virtual character (an avatar) to participate in this virtual world. There are various entertaining elements in LV. For example, students can earn the “passion” value and upgrade their own status through playing a range of mini-games. Furthermore, there are various “hangout places” for students to meet one another. The interactions include real-time chat, making funny gestures and showing funny emotional icons to draw others’ attention, etc. Figure 1 shows one of the hangout places in LV.



Figure 1. A hangout in LV

Besides the entertainment, LV facilitates students’ 2-tier issue-based discussion for collaborative learning. The first-tier is “village-level discussion,” while the second-tier is “house-level discussion”. Both levels of discussion can take place concurrently.

Each *village* in LV represents a discussion issue. A student can create a village, taking the role of *Chieftain*

by initiating an issue for discussion. Any other students in LV who are interested in that issue, can become *Villagers* by building *houses* in that village. They can use houses to elaborate, for example, their perspectives, arguments or some related concepts with respect to the issue. In addition, students can build *roads* between the houses to interconnect different perspectives, arguments or concepts delineated in the village. They can make use of different types of roads, namely, *Explanation*, *Evidence*, *Problem*, *My Reply*, *Solve This First*, *Another View*, *Compare With*, and *Others* to reflect the different relationships between the elaborations represented by those houses. This is called village-level (*the first-tier*) discussion. An example is shown in Figure 2.



Figure 2. Village-level discussion

In the village, actually, every house is “enterable”, and it functions as an individual forum to facilitate discussion on a specific perspective, argument or concept raised in the village-level discussion. In LV, the term “*postings*” is used to represent the discussion threads inside houses (see Figure 3). This is called house-level (*the second-tier*) discussion. The more postings there are in a house, the larger its size and the higher its modernity level will be.

The advantage of the 2-tier design in LV is that, major perspectives, arguments and related concepts, as well as their relationships with respect to a discussion issue can be arranged neatly in the form of mind mapping at the village level. However, it is still handy for students to review the details of a particular perspective, argument, or concept discussed at the house level.



Figure 3. House-level discussion

In order to encourage students to participate in quality issue-based discussions, the invest-and-reward mechanism is one of the strategies adopted in LV for the purpose. Every time when a student creates a village, or builds a house in villages created by others, he or she has to pay “donuts” (*the virtual money in LV*). Nevertheless, when the number of quality houses and postings in the villages (*that he or she has “invested” in*) reaches a certain amount, the village will be upgraded by either the LV system administrator or their learning facilitators (*usually their teachers*). Benefits brought about by the upgrade include donut reward, higher social status conferment for enjoying extra privileges in LV, etc.

3. Method of the study

Two classes of fifth-graders from two elementary schools (*hereafter referred as School A and School B*) located in different districts in Hong Kong were the subjects of the present study. It was a convenient sample with 74 students (*at the age of 11.2 in average, 35 males and 39 females*), 36 students from School A and 38 students from School B.

Preceding the learning experiment, the students in each class were divided into nine roughly equal-size groups so that the groups are equivalent in the distributions in gender and academic performance. After that, every group in School A, on a random basis, was further paired up with a group in School B to form an *inter-class collaborative learning team* (*hereafter referred as a “team”*) to conduct issue-based discussion in a collaborative fashion in the experiment. Thus, 9 teams were formed, each composed of around eight students, half from School A and half from School B.

3.1. The posting templates

One month prior to the learning experiment, we formed a working group together with five teachers of General Studies (*a core subject in the curriculum of Hong Kong elementary education*) from the two participating schools, including two subject leaders who have rich experience in facilitating project-based learning.

In the working group, besides discussing the design and the logistics of the study, we also framed two posing templates to assist students in the elementary fifth grade in making argumentative elaborations in issue-based discussion in LV. The first one was designed for elaborating new arguments (*Template 1*), while the second one was designed for responding to arguments made by others (*Template 2*). The two posting templates are shown in Figure 4. Basically, they contain the same three major components, i.e., *a claim, a reason, and a source of evidence*.

<p>Template 1 I argue / advocate that _____, because _____. Sources of Evidence: _____ (URL, books, newspapers, etc.)</p> <p>Template 2 I agree / disagree that _____, because _____. Sources of Evidence: _____ (URL, books, newspapers, etc.)</p>

Figure 4. The posting templates

3.2. The learning experiment

The experiment was composed of two phases. The first phase was designed to investigate whether the provision of the posting templates could enhance students' argumentative elaborations in LV (*i.e., the first research question*). The second phase was designed to investigate whether the effect of the posting templates on students' argumentative elaborations was sustainable (*i.e., the second research question*). In both phases, the students were assigned to work in teams in the inter-school fashion as described previously. All of the learning facilitation activities in the experiment were co-conducted by two teachers, one from School A and one from School B. Within the process, the teachers were allowed to give "just enough" assistance to help the teams to pursue their issue-based discussions when necessary. For instance, at the beginning of a discussion, the teachers would

create one or two "initial houses" in each of the villages for stimulating each team to frame the possible directions of inquiries about their own discussion issue.

3.2.1. Phase 1. This phase took four weeks (*namely, Week 1, Week 2, Week 3, and Week 4*) to complete, in which each team pursued online discussion on a real-life open-ended issue through LV. There were three discussion issues³ adopted in this phase. Thus, every three teams were assigned to discuss the same issue; however, every team conducted the discussion separately in different villages. Every week, in School A and School B respectively, the teachers conducted a 30-minute face-to-face lesson to facilitate the sharing of their own class' learning experience in LV. We observed each of the lessons held in the respective schools. After each lesson, we interviewed different students, in a friendly and informal manner, to gain more understanding of their learning process.

At the beginning of Week 2, the teachers introduced the posting templates described previously to the students in the lesson, and displayed the templates on an electronic notice board (*a clickable on-and-off window*) in each of the villages for the students to have easy reference. The templates were displayed until the end of Week 4.

3.2.2. Phase 2. Three months after Phase 1 had completed, Phase 2 of the experiment was executed. This phase was a delay investigation, in which each team worked in the same way as Phase 1. They were assigned to conduct another discussion on another issue⁴ in LV. In fact, this phase duplicated the experimental procedures carried out in Phase 1, except in two aspects. The first aspect is the teachers neither mentioned the posting templates in the face-to-face lessons nor displayed them in the villages. In addition, since one month before the start of Phase 2 and until its end, all of the villages created in Phase 1 were made hidden in LV. Thus, the students were unable to refer to the style of their previous elaborations.

³ The discussion issues adopted in Phase 1 were:

- Should an elementary fifth-grade student bring his/her mobile phone to school?
- Should an elementary fifth-grade student make use of instant messaging software to communicate with others?
- Should we trust the advertisements in electronic media?

⁴ The discussion issues adopted in Phase 2 were:

- Do you have other suggestions of the form and mode of torch relay in the Olympic Games?
- If it was not the Olympic Equestrian Events, which events could Hong Kong co-host in the Beijing 2008 Olympic Games?
- How should one be qualified to be selected as a torch bearer in the Olympic Games?

The second aspect is the duration. This phase was shortened from four weeks to two weeks. It was because the remaining time of the semester was not sufficient to implement the 4-week phase.

3.3. Analyzing argumentative elaborations

We adjusted Weinberger and Fischer's [8] framework of argumentative knowledge construction before adopting it to analyze the students' argumentative elaborations in the experiment. The original framework suggests four categories of argumentative elaborations, namely, *simple claims*, *qualified claims*, *qualified and grounded claims*, as well as *non-argumentative moves*. We modified the categories that contain the component of "qualifiers" for the present study.

Qualifiers refer to statements that limit the validity of a claim to specific circumstances [8]. In other words, a claim becomes a "qualified" one if the concerned qualifiers are delineated therein. Nevertheless, the purpose of the present posting templates was to assist elementary students in elaborating on arguments with claims, reasons, and evidence properly. Enabling them to make qualified claims was not our current focus. Hence, modification to the original framework was necessary. We revised the categories of "qualified claims" and "qualified and grounded claims" in Weinberger and Fischer's original framework into *rationalized claims*, as well as *rationalized and grounded claims* respectively. The modified framework and the corresponding explanations of the categories are shown in Table 1.

Table 1. Categories of argumentative elaborations

Category	Explanation
<i>Simple Claims</i>	<i>Claims that advance ones' position(s), without the provision of reasons and grounds</i>
<i>Rationalized Claims</i>	<i>Claims that advance ones' position(s), with the provision of reasons to rationale the claims</i>
<i>Rationalized and Grounded Claims</i>	<i>Claims that advance one's position(s), with the provision of reasons to rationalize the claims, and grounds to warrant the claims</i>
<i>Non-argumentative Moves</i>	<i>Statements that coordinate the discussion moves, such as clarifications, requests for others' clarifications, etc.</i>

4. Findings

There were 757 and 371 postings in the villages in Phase 1 and Phase 2 of the learning experiment respectively. Within 1 month after each phase, with the use of the modified framework described in Section 3.3, we finished categorizing all students' postings into

the 4 categories—*Simple Claims*, *Rationalized Claims*, *Rationalized and Grounded Claims*, as well as *Non-argumentative Moves*.

4.1. Effect of the posting templates (Phase 1)

Table 2 shows the number of the students' postings and their proportional percentage among different categories in the four weeks (*Week 1*, *Week 2*, *Week 3* and *Week 4*) in Phase 1. "S" stands for Simple Claims, "R" stands for Rationalized Claims, "RG" stands for Rationalized and Grounded Claims, and "N" stands for Non-argumentative Moves. Figure 5 shows a graphical presentation of their proportional distribution across the weeks. According to the results, we found that the posting templates provided in this phase had positive effect on the students' argumentative elaborations in LV to a certain extent.

Table 2. Number of postings among 4 categories in each week in Phase 1

Week	Category				Total	
	S	R	RG	N		
1	Count	145	49	11	17	222
	% within Week	65.3%	22.1%	5.0%	7.7%	100.0%
2	Count	43	74	46	17	180
	% within Week	23.9%	41.1%	25.6%	9.4%	100.0%
3	Count	27	50	85	26	188
	% within Week	14.4%	26.6%	45.2%	13.8%	100.0%
4	Count	11	38	89	29	167
	% within Week	6.6%	22.8%	53.3%	17.4%	100.0%

In Week 1 (*the posting templates had not yet been provided*), the majority of the students' postings were Simple Claims (65.3%). Some of them were able to make claims with reasons to rationalize their arguments (22.1%); however, few students could make arguments with the provision of both reasons and grounds.

The posting templates were introduced to the students in Week 2. Compared to Week 1, the categorical distribution of Week 2's postings changed. Rationalized-Claim postings dominated (41.1%) in the week. The proportional percentage of the Simple-Claim postings dropped around 40%, whereas the proportional percentage of the Rationalized-and-

Grounded-Claim postings increased by 20% approximately.

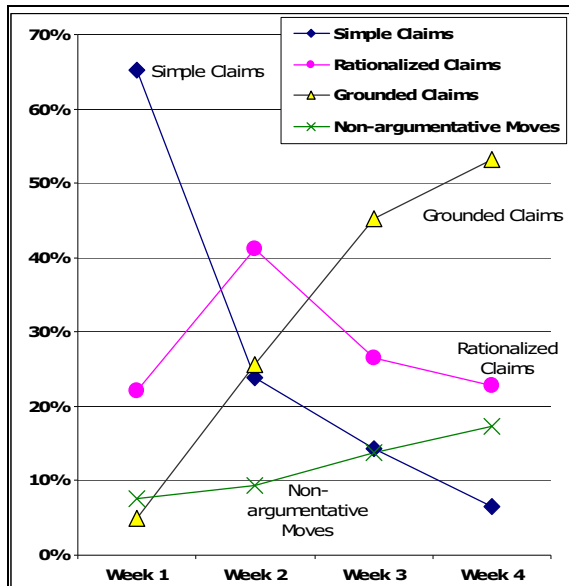


Figure 5. Proportional distribution of postings among 4 categories in each week in Phase 1

In Week 3 and Week 4, the Rationalized-and-Grounded-Claim postings became dominant, with proportional percentage of 45.2% and 53.3% respectively. In addition, compared to Week 1 and Week 2, there were relatively small number of Simple-Claim postings found in these two weeks.

Was the increase of the students' postings of Rationalized and Grounded Claims in LV in the latter weeks solely due to the provision of the posting templates? In order to answer this question, during the study, we selected and interviewed different students for gaining more understanding of their learning process in LV.

During the interview, Student X who started to create postings of Rationalized and Grounded Claims in Week 2 (but not in Week 1) said, "I started to elaborate on my arguments with reasons, and some sort of evidence after my teacher had introduced the posting templates to us in the face-to-face lesson. When I was creating a new posting in the village, I would look up the templates for reminding myself about what I need to include in this new posting."

In fact, nearly all of the Rationalized-and-Grounded Claim postings found in this phase were in the style of the templates. Besides, many other students who started to create their Rationalized-and-Grounded-Claim postings in Week 2 gave similar comments as Student X did. This showed that, to a certain extent,

the increase of postings of Rationalized and Grounded Claims was facilitated by the posting templates.

Apart from that, we also interviewed students who started to write their Rationalized-and-Grounded-Claim postings in Week 3 or Week 4 (but not in the previous weeks). According to Student Y, "my team didn't pay much attention to the posting templates at the beginning. We just wrote our postings as what we used to do in other discussion forums ... In Week 3's face-to-face lesson, the teacher invited different teams to share their learning experience in LV with others. We realized that some classmates could make convincing arguments for what they wanted to advocate. They mentioned that the posting templates did help them a lot. My teammates and I started to refer to the templates when composing arguments in our village."

Student Y's comment also accords with what we observed in the face-to-face lessons. In fact, not all students could benefit simply from the direct provision of the posting templates. In the present study, the peer-sharing in the face-to-face lessons facilitated by the teachers was another important intervention to enable the students to distinguish between good and bad examples of arguments, and help them to improve their argumentative elaborations.

4.2. Sustainability of the effect (Phase 2)

Table 2 shows the number of students' postings and their proportional percentage among different categories with respect to the two weeks (Week A and Week B) in Phase 2. The Rationalized-and-Grounded-Claim postings still dominated in Week A and Week B, with proportional percentage of 41.4% and 53.5% respectively. Although the posting templates were not provided in this phase, the format (starting with an argument followed by a reason and then a source of evidence) of most of the Rationalized-and-Grounded-Claim postings were quite similar to that of the templates provided in Phase 1. The proportional percentage of the Simple-Claim postings was at a relatively low level in both weeks (12.4% in Week A, and 11.4% in Week B).

After examining other evidence gathered from the lesson observation and student interviews in this phase, the respective increase and decrease of the Rationalized-and-Grounded-Claim postings as well as the Simple-Claim postings from Week A to Week B could be explained by the effect of the peer-sharing (as described in Section 4.1) facilitated by the teachers at the beginning of Week B.

Table 3. Number of postings among 4 categories in each week in Phase 2

Week	Category					
	S	R	RG	N	Total	
A	Count	23	58	77	28	186
	% within Week	12.4%	31.2%	41.4%	15.1%	100.0%
B	Count	21	43	99	22	185
	% within Week	11.4%	23.2%	53.5%	11.9%	100.0%

To further investigate the sustainable effect of the posting templates, we conducted some comparisons between Week 4 and Week A, as well as Week 4 and Week B.

4.2.1. Week 4 VS. Week A. Since Week 4 was the ending week of Phase 1, its categorical distribution of the students’ argumentative elaborations could be treated as the students’ learning attainment in Phase 1. As for Week A, it was the beginning week of Phase 2, and there was a 3-month time lag between Week 4 and this week. Thus, by comparing the categorical distributions of these 2 weeks, we could examine the extent of the sustainable effect of the posting templates on the students’ argumentative elaborations in LV.

Figure 6 shows a graphical presentation of the respective proportional distributions of Week 4’s postings and Week A’s postings among the 4 categories. Although the Rationalized-and-Grounded-Claim dominated in both weeks, Week 4’s proportional percentage was around 12% higher than Week A’s. Concerning the Simple-Claim postings, the proportional percentage in Week 4 was around 6% lower than Week A. A Pearson chi-square test indicated that there was significant difference between the categorical distributions of Week 4’s postings and Week A’s (chi-square = 8.22, p-value = 0.04).

According to the results, without the provision of the positing templates, there was no guarantee that the attainment of the students’ argumentative elaborations in LV, after a period of time (3 months in the present study), could reach “**immediately**” to a comparable level to the attainment with the introduction of the templates.

4.2.2. Week 4 VS. Week B. Further, we investigated whether the students’ attainment of argumentative elaborations in Week B (*the ending week of Phase 2*) could reach eventually a comparable level to that they achieved in Week 4 (*the ending week of Phase 1*). Figure 7 shows a graphical presentation of the proportional distribution of the postings among 4 categories in Week 4 and Week B.

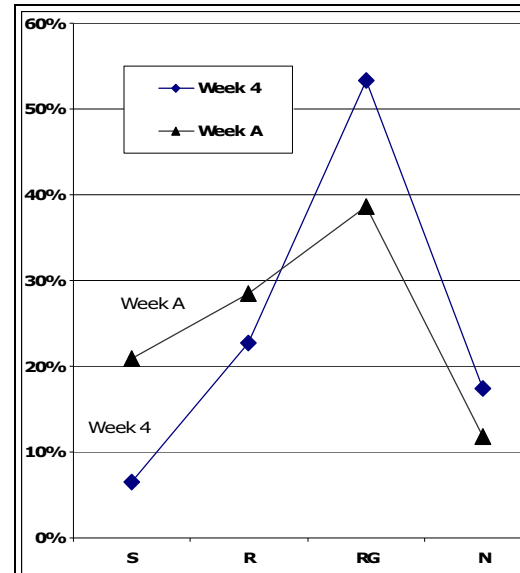


Figure 6. Proportional distribution of postings among 4 categories in Week 4 and Week A

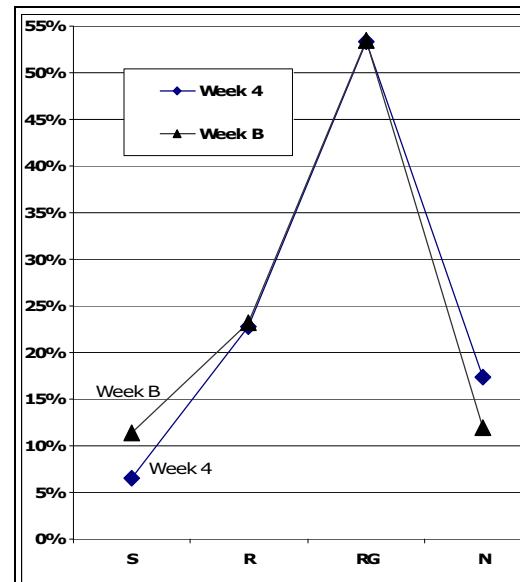


Figure 7. Proportional distribution of postings among 4 categories of Week 4 and Week B

The Rationalized-and-Grounded-Claim postings dominated in both Week 4 and Week B, with the proportional percentage of 53.3% and 53.5% respectively. Also, the proportional percentage of the Simple-Claim postings was at a relatively low level in both weeks (6.6% in Week 4 and 11.4% in Week B). A Pearson chi-square test showed that there was no significant difference between the categorical distributions of Week 4’s postings and Week B’s postings (chi-square = 4.02, p-value = 0.26).

According to the results, although the posting templates were not provided in Phase 2, the students could achieve eventually a comparable level of attainment to the level attained with the access to the posting templates in LV. We attribute the resumption to peer-sharing and experience re-collection.

5. Conclusion and discussion

This research investigated the effect of the provision of posting templates for elementary fifth-grade students' argumentative elaborations in LV—a game-based CSCL platform. The introduced templates contain three major components—a *claim*, a *reason*, and a *source of evidence*. We adjusted Weinberger and Fischer's [8] original framework so that the modified framework is more suitable to categorize and analyze the students' elaborations in the present study.

According to the findings, the posting templates could assist the students in constructing arguments containing reasons and grounds to rationalize and warrant their arguments in LV. In the presence of the templates, the students could achieve a certain level of attainment of argumentative elaborations. However, in the absence of the templates, there was no guarantee that all of them could reach “immediately” the same level of attainment (*regarding the results of the comparison between the students' attainment in Week 4 and Week A*). Nevertheless, we found that the students' face-to-face peer-sharing (*facilitated by the teachers*) and experience re-collection could help them to resume a comparable level of attainment (*regarding the results of the comparison between the students' attainment in Week 4 and Week B*).

One of the limitations in the present study is that we did not set up a control group. All of the comparisons were done within the same group of students' performance in different weeks of the different phases in the learning experiment. Thus, repeating the same experiment with the presence of a control group, *i.e.*, a group in which students have issue-based discussion in LV without the provision of the posting templates in Phase 1, is now on our agenda for further study.

In addition, the quality of the grounds that the students provided to warrant their arguments has aroused our concern. In the present study, it was noticed that a certain portion of the cited grounds in the postings came from *Wikipedia* and *Yahoo! Answers*. In fact, the content in these Web 2.0 references has been raising doubts (e.g., [14]) about their authenticity. Our worry is that students use “unwarranted grounds” to substantiate their arguments. In view of the concern, empowering students to

evaluate and use “authentic” grounds for participating in CSCL has become another issue which is worth further research efforts.

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