Secondary three students' online journal writing for a physics project: facilitation and assessment

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ABSTRACT

As part of a Student-Initiated Assessment (SIA) on application of physics in environmental issues, secondary three students formed groups and engaged in online journal writing. Features of their group journals are analysed. This analysis together with the outcome of surveys of the students' learning process and the teachers' facilitation experience are used to improve the guidelines for effective facilitation as well as the rubric for a meaningful assessment.

INTRODUCTION

Journal writing in science is used to facilitate students' learning over all ages, from primary school students (Mahardale et al.,2008) to preservice teachers (Wallace & Oliver, 2003). Different authors have use a variation of terms for journal writing, like science notebooks (Ruiz-Primo, et al., 2004), thinking journals, affirmational dialogue journals, log sheets, dialectical journals, think-aloud journals, and team journals.

Journal writing in science provides a means for students to record their learning experiences and reflections. It may be used to describe the problems students are trying to solve, the procedures used, the observations made, their conclusions and their reflections. Journal writing also provides teachers with a useful tool for monitoring students' learning process and giving timely feedback. Research has shown that journal writing can also be used effectively as a mode of assessment (Ruiz-Primo et al., 2004).

In Singapore schools, journal writing is frequently explored as a means to motivate students' learning (Hougang Primary School, 2007) and enhance their appreciation of science (Mahardale et al., 2008). With the increasing popularity of web 2.0 tools for online collaboration, blogging has also been explored as a popular alternative to traditional journal writing on paper (Ong et. al., 2008).

In our school, as an alternative mode of assessment, Student-Initiated Assessments (SIAs) form part of the formative assessment of students' learning. For physics, the SIA used for secondary three was a Textbook Extension Activity (TEA). Secondary three students were given the opportunity to propose and explore the application of physics in environmental issues. Topics include solar cells, fuel cells, desalination, satellite imaging and noise pollution. Hence the SIA task was given the name Green TEA. Three to four students form a group and propose a topic of research to embark on.

The physics SIA assessment involved 4 tasks: a proposal, journal writing, poster and presentation, over a period of 28 weeks. Evaluating the learning process experienced by the students was an important component in the assessment. The possible infusion of ICT in the assessment process was also considered. Hence, to evaluate the students' learning process, the use of online journal writing (over 20 weeks) was designed as one of the task.

Description of task

Activities	Assessment guidelines (also refer rubrics)	Schedule
4. Create and maintain an online journal specifically for this SIA (e.g. webpage, blog, wiki, NYGH LMS).	Regularly update records of research activities, meeting notes, review of reference materials. Indicate dates and contributors.	1st grading: March 2nd grading: June

Assessment Rubric

Criteria	2	1	0	Max Score
Online journal (4)	There is evidence that the journal is updated in a regular manner and all members contribute.	There is little evidence that the journal is updated regularly.	No journal.	2
	There is evidence that the journal is used effectively as a means of consolidating and sharing information.	There is little evidence that the journal is used effectively as a means of consolidating and sharing information.	No journal.	2

RESEARCH QUESTIONS

1. What are the learning points for students as they set up the online journal, interact online to share ideas, knowledge and research materials?
2. What are the learning points for teachers as they facilitate and monitor the progress of their students' online journals?
3. What are the elements of a meaningful assessment rubric for online journal writing?

METHODOLOGY

In this research, we explored how online journal writing can be
1. an effective means to facilitate student learning, and
2. an assessment tool for learning.

At the end of the SIA, a survey was conducted to find out the challenges faced by each group in completing the online journal task. A total of 89 groups were surveyed. A survey of the teachers involved was also conducted to find out their perception of the students' quality of work, and professional challenges in guiding the students in the task.

RESULTS & DISCUSSION
(See Annex A for charts)

Students' Survey
Question 1:   **Online platform**
- Most groups (94% or 83 out of 89) of the project groups responded that they used a blog platform to set up their online journal. This is probably because blogs are very common and user-friendly online platforms for many users to start their first online postings (see *question 2* response).

Question 2:   **Prior use of online journal for personal use**
- Use of online journals is very common amongst the students. 98% (87 out of 89) of the project groups have members who have done some personal blogging before embarking on this project. An expected result since web 2.0 tools usage, especially blogging, is popular among the younger generation.

Question 3:   **Prior use of online journal for school project**
- However, the use of online journal writing is less common in students' projects up till their studies in lower secondary. 42% (37 out of 89) of these Secondary 3 groups have not used an online journal for any school project.

Question 4:   Understand expectations
- 64% (56 out of 89) of the groups disagree that the expectations of the journal writing task are difficult to understand. In other words, the expectations of the journal writing task presented in the instructions and rubrics are not sufficiently clear to about 36% of the groups. This is an area for improvement.

Question 5:   Set up online journal
- The majority (96%) of the groups have little difficulty in setting up the online journal. This is consistent with the high percentage of groups with members who have personal online journals (*question 2*) or have carried out projects using online journals (*question 3*).

Question 6:   Time to update regularly
- Many groups (60% or 54 out of 89) encounter difficulty in finding time to update their online journals regularly. The students' busy schedule due to their school work and CCAs could be factors related to this response.

Question 7:   Find suitable materials
- Slightly less than half (42%) of the groups feel that they have difficulty in finding suitable materials during their research for updating their online journals.

Question 8:   Members posting regularly
- Slightly less than half (45%) of the groups observe that their group members have difficulty in contributing to their online journals on a regular basis. This could be due to difficulties due to a busy school schedule (*question 6*) and/or difficulty in finding suitable materials for their research topic (*question 7*).

Question 9:   Evaluation of materials
- Most groups (76%) feel that they have done adequate evaluation of the materials which they post on their online journal.
- Their experience with lower secondary interdisciplinary project work (and other subject-based projects, e.g. Language Arts and Humanities) would have given them the skills for evaluating the quality of the materials they found online.

Question 10:   Original ideas/comments
- Most groups (70%) also feel that they have posted sufficient original ideas or comments on their online journal.

Question 11:   Group's discussion records
- Over half the groups (62%) feel that they have adequately posted online records of their groups' discussions. These records include choice of topics, brief minutes of meetings, suggestions for poster design, decisions on work allocation, etc. as observed in their online journals.

Question 12:   Acknowledge sources
- Most groups (84%) have put in effort to acknowledge the sources of the materials they have used for their online journal entries
- This is often indicated by the website URLs, as observed in the online journals.

Question 13:   "Cut & paste" entries
- Despite efforts to evaluate sources of the materials they used, a significant proportion of the groups (38%) admit that they used much "cut and paste" method of posting journal entries of their research.
- This could be out of convenience, laziness or lack of awareness and/or lack of practice in annotating researched materials.

Question 14:   Copyright issues
- Most groups (91%) are fully aware of the copyright issues concerning the use of materials taken from other websites.
- They often acknowledge the sources of the materials (*question 12*) but many have the poor practice of using "cut and paste" way of displaying their researched materials (*question 13*), which has the potential for copyright infringements, when the permission is not explicitly granted by the copyright owners.

Limitations:
- The survey did not probe the reasons behind the students' options.
- There could be specific questions to survey their attitudes and level of interest towards the journal writing task

Teachers' Survey

Four teachers who supervised the project groups gave their feedback. The teachers agree that the groups set up their online journals easily and meet the basic requirements for the journal entries. They observe that some groups do face difficulties in the following areas:
- updating their journal regularly, (also evident in the students' survey results)
- posting original ideas and group discussions
- showing adequate evaluation of their researched materials

They also observe that there is a need to heighten students' awareness of copyright issues with regards to use of materials from other websites, so as to reduce the incidents of "cut & paste" practice and to educate students on acknowledging the sources of their materials.

The teachers believe that online journal writing is a meaningful alternative mode of assessment for students' learning. They have varied experience in using blogs or in supervising project students in blogging. The teachers feel that they do not require formal training in setting up online journals, though some feel that their facilitation skills can be sharpened through training.

Implications for teaching and learning

1. **A blog** (and other web 2.0 tools) can be easily used as an online platform for journal writing

   The advantages of using blogging include
- Infusion of ICT familiar with teenagers: ease of setting up and use
- Readily accessible via internet anytime, anywhere
- Easy collation of research materials (compared with pen and paper method)
- Convenient portal for collaborative learning: easy sharing of ideas, discussions
- Easy monitoring and feedback by teachers (who are given rights to post comments)

Commey and Stephenson (2001) reviewed current research to find out what works well in online learning. The review reveals that designers of online learning should pay considerable attention to four factors: dialogue, involvement, learner support, and learner control.

The use of blogging provides a platform to satisfy these factors. For online dialogue or discussion to be successful, its use has to be structured into the task guidelines to engage a higher level of students' involvement in collaborative work. Support in the form of face-to-face contact, online supervision and feedback on performance is also important. A blog and other web 2.0 tools allow much learner control over learning activities and schedule, which can motivate learners carrying out an online journal writing task.

2. Assessment of the learning process

- In performance tasks, due to the ease of assessment, the outcome of a student's performance is often focused on the final products, e.g. a poster, a model, a written report.
- Online journal writing provides a convenient means to shift the focus from the products to the process of learning, allowing regular monitoring and feedback from teachers. Qualitative as well as quantitative data for assessment of journal writing can be collated.

3. Student readiness - Guidelines and Rubric

- The students have little difficulty in setting up their online journals (using web 2.0 platforms) and fulfilling most of the requirements for posting entries on their group journals. Their journals display some efforts to include notes on group discussions, decision making, and evaluation of materials. Over the course of the project, there is also a gradual transition from "cut and paste" practice (superficial postings) to more original evaluation of materials, comments, ideas and discussions (deeper postings).
- Clear **guidelines** need to be given on the following:
  - Awareness of security threats – privacy setting, administrator control
  - Etiquette in postings
  - Copyright issues
  - Best practice for evaluation and acknowledgement of researched materials
  - Prompting questions to guide online interaction and discussion.

  These would help to minimize certain differences in students' perceptions and teachers' expectations as revealed in the surveys.
- The expectations spelled out by the **rubric** can also be improved to provide greater clarification on some of the performance indicators like:
  - Average frequency of postings
  - Average number of postings per group member
  - Types and samples of items expected in entries
  - Effective organization of online journal to reflect entries by type/member etc.
  - Group reflections
- However, we need to bear in mind that the current rubric for the online journal writing task was kept simple (only 4 marks allocated) as this task (out of 4 tasks) only provides one perspective of the students' learning in the SIA. Ease of assessment by teachers was a factor in the simplicity of the rubric's initial design. Greater depth in assessment may warrant a higher allocation of marks.

4. Teacher readiness

- The feedback from teachers indicates they are well-placed to facilitate students' use of online journal writing, with improvement in the design of the guidelines and rubric.

CONCLUSION

- Students are ready to use online journal writing to enhance their learning process with greater clarity in the guidelines and assessment rubric provided for a task.
- Teachers could work on improving the design of the guidelines and rubric, and sharpen their facilitation skills.

Future plans
- Other web 2.0 tools (such as wikis, with more versatile online features) may be introduced to students as well as teachers for online collaboration.
- Online journal writing could be incorporated into other science projects or assignments as an alternate assessment of the learning process.

Further research
- Cross-subject comparison of online journal writing
- Depth of reflection and collaboration practices in journal writing
- Online journal writing for formative and summative assessments

References

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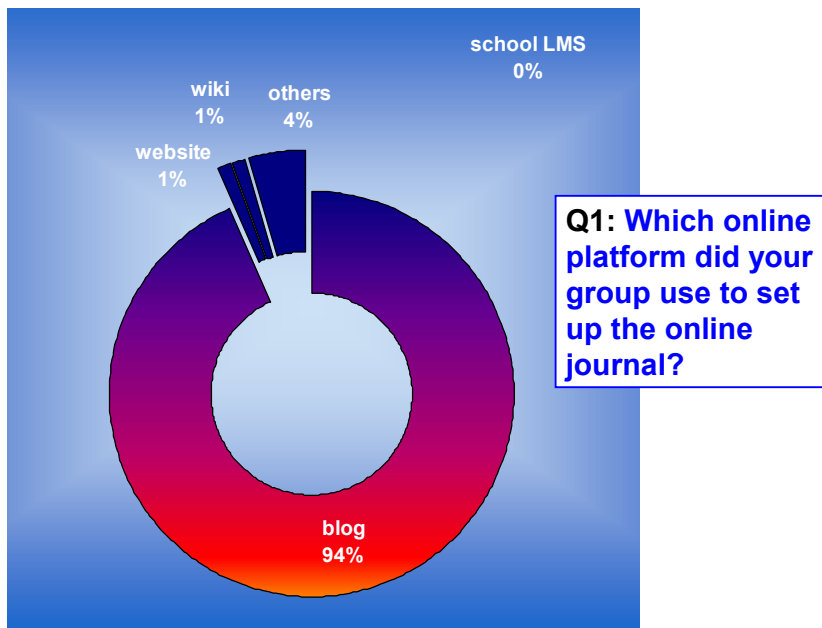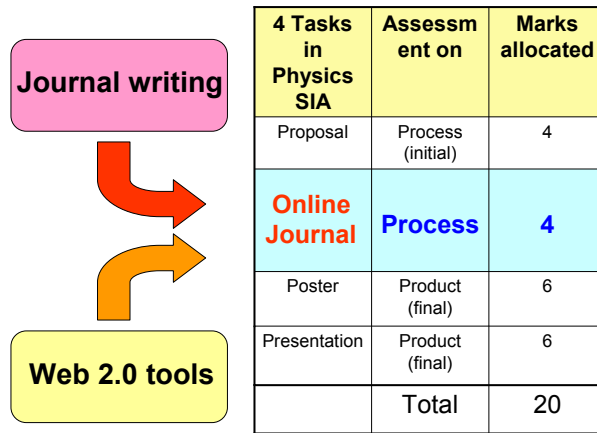
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Acknowledgements

Annex A

4 Tasks in Physics SIA	Assessment on	Marks allocated
Proposal	Process (initial)	4
Online Journal	Process	4
Poster	Product (final)	6
Presentation	Product (final)	6
	Total	20

Journal writing → Web 2.0 tools

Q1: Which online platform did your group use to set up the online journal?

- website 1%
- wiki 1%
- others 4%
- school LMS 0%
- blog 94%

Questions 2 & 3: Before this project, has any one of your group members used an online journal for …

NO 2 — YES 87 (Q2 for personal use)
NO 37 — YES 51 (Q3 for school project)

No. of groups
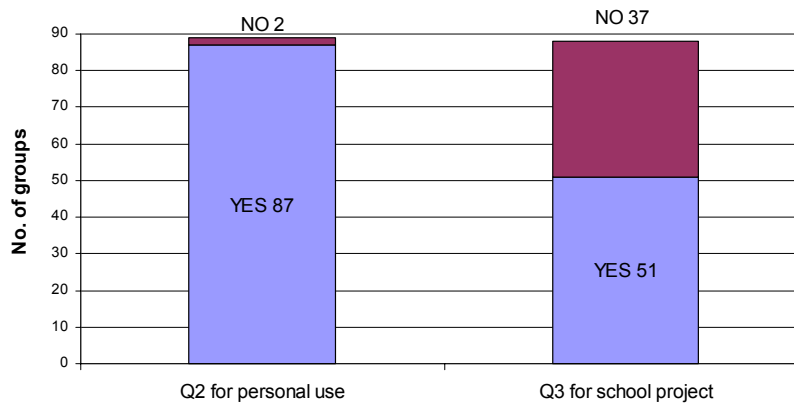
Questions 4 to 8: It is difficult for your group to ...
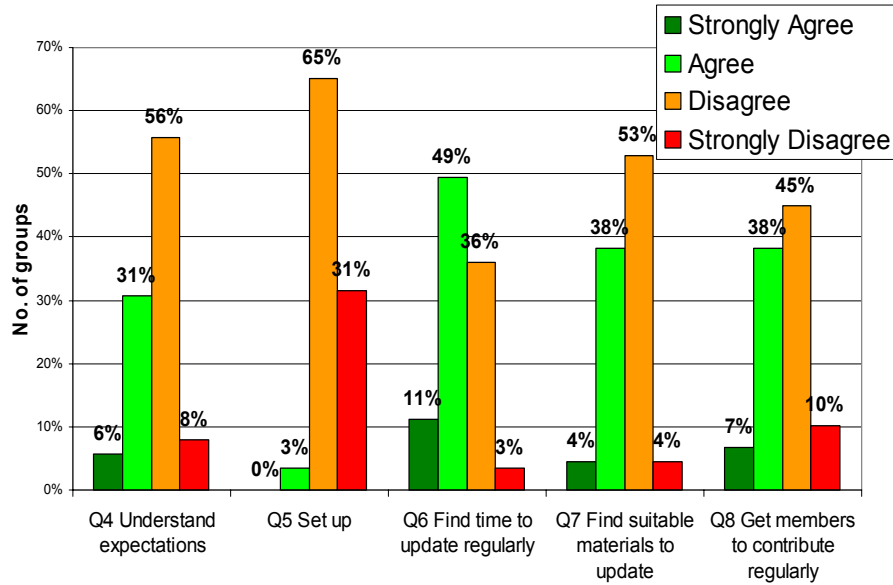
Questions 9 to 11: Your group's online journal contains adequate ...
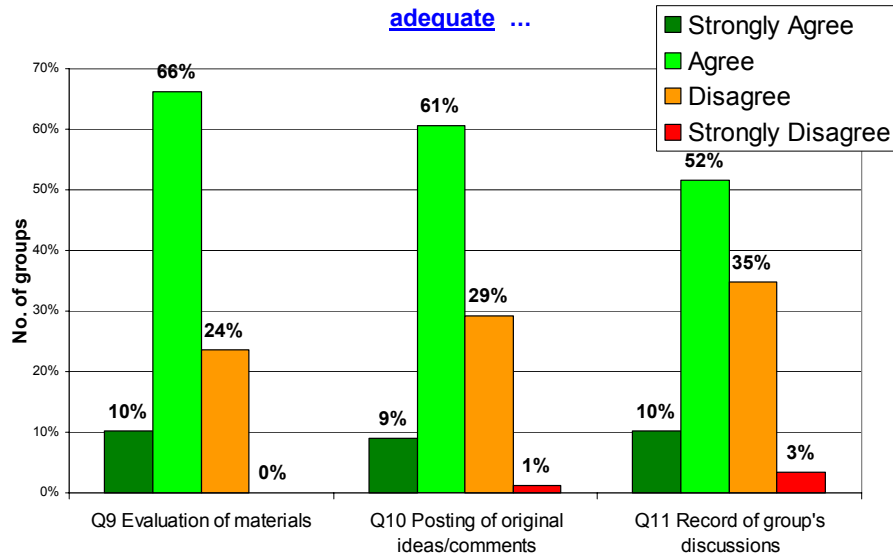
Questions 12 & 13: Your group's online journal contains …
Question 14: Your group is fully aware of ...