Online reflection journals: Learning through assessment

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The present study was conducted to investigate the extent to which students believe that journal writing contributes to improving their learning. The research was conducted at a post-secondary institution which organises its curriculum around principles of problem-based learning, and in which students have to reflect on their learning daily. In the particular curriculum, reflection journals form a part of the daily assessment. To that end, a questionnaire was developed containing statements derived from the literature, about the effects of journal writing on students' learning. It was then pilot-tested on a group of second- year students (n = 327). Analyses of the data collected showed that students were able to identify the four latent constructs underlying the 15-item questionnaire, as indicated by the fit of the hypothesised model. Construct reliability values of the four scales gave evidence of good reliability in terms of internal consistency. Correlation coefficients computed for the questionnaire scales were positively correlated and statistically significant. Students, who believed that journal writing enables them to think and write reflectively, agreed that frequent journal writing improves their learning. These students are also more likely to use their journals as a tool to manage the impressions of their facilitators, and to feedback about the contributions of their peers towards team work. These findings suggest that the use of online reflection journals provides many opportunities for students to reflect on their learning. Facilitators can also monitor students' progress through their reflections, and to provide specific, detailed feedback to aid students in their learning.

Keywords: Students' beliefs, reflection journals, learning, problem-based learning, daily assessment

Introduction

The use of reflection journals (RJs) (also known as 'learning journals' or 'reflective journals') as vehicles to promote reflection on the learning process has been widely discussed in the literature. Many researchers have reported on the beneficial effects of journal writing on students' learning. These benefits include the usefulness of the journal as a tool to encourage and record reflection in learning (O'Connell & Dyment, 2006), and to improve on writing skills (Kerka, 1996). Through journal writing, students are suggested to become better aware of their learning achievements (Chirema, 2007).

In contrast, some other researchers are less optimistic about the use of RJs for improving students' learning. In a focus-group study by Lew & Schmidt (2007), they compared teachers' and students' perceptions of assessing students' ability to reflect upon their learning. Their findings revealed that both teachers and students understood the didactic purpose of keeping a RJ but perceptions of its actual use differed. Teachers generally believed that self-reflection helps students become better learners. On the contrary, students did not see the journal as valuable in its own right (as was the purpose). They reported using the journal as: (1) a study aid to summarise the contents of what they had learnt, instead of using it to reflect on their own learning process, (2) as a tool to manage the teachers' impressions of their performance, and (3) to feedback on teamwork. Students believed that their journals were used by their teachers (to some extent) to arrive at the grades, and reported feeling overwhelmed by the daily rigor of journal writing. In another study, Kerka (1996) reported that students used the journal as an instrument to attack fellow students. She also highlighted the problem of assessing journals expressly written for what the teachers wished to see, since the students were predominantly concerned with what their teachers wished to find in their journal responses.

The studies summarised here suggest that to fully exploit the effects of assessment on students' learning, one must first understand how students perceive these measures. The way in which a student perceives

assessment will determine the way he responds to it. To add on, the learner's experience of assessment determines the way in which the student tackles his learning. To that end, a questionnaire containing statements about the value of reflection journals was developed and pilot-tested on a group of second-year students at the institution.

Method

Subjects

Participants were 327 students in their second-year of studies in the academic year 2007-2008. Second-year students were selected for the pilot study because they were familiar with the daily assessment system having gone through 2 semesters (32 weeks) of studies. The majority of the participants (52%) were females, and the mean age of the all participants was 18.80 years (*SD* = 1.54) (which reflected the demographic of the entire cohort of second-year students).

Educational Context

Problem-based learning (PBL). The research was carried out at an institution of post-secondary education that organises its curriculum according to principles of PBL. Each class has about 20-25 students, guided by a facilitator. Students work collaboratively in teams of 4-5, with learning centered on problems relevant to their domain of study. They work each day on one problem. The problem is initially discussed in the morning; followed by ample self-study. At the end of the day, information gathered is shared and elaborated upon.

Information and Communications Technologies (ICT) for teaching and learning. Students, all of whom carry personal notebook computers when on campus, use the wireless environment on campus extensively during their daily work. All forms of assessment are conducted online by means of a web-based eLearning platform. This platform enables students to engage themselves academically in diverse ways, inclusive of accessing learning resources and facilitators' feedback about various aspects of their learning. Students also can do their self- and peer evaluations, and make required submissions of their journal responses online. The provision of these assessment tools via the web-based platform gives students easy access to them on an anytime and anywhere basis. This also provides them with sufficient time to reflect on their own performance and process of learning, as well as that of their peers', even after their classes.

Daily assessment in the curriculum. The daily assessment approach consists of four, independent elements: (1) a judgment by the facilitator on how well students have performed during the day, (2) a RJ to be written by each student, (3) a self-evaluation, and (4) a peer evaluation (how students were judged by their team mates). Students' daily grades are derived based on all these elements. The facilitator judgment consists of his/her observations of students' learning (such as self-directedness, level of participation and quality of contributions during the day, teamwork and communication skills). Facilitators also provide daily feedback to students on various aspects of their learning. The RJ consists of a short essay created by the student, that is 'personal' and records his/her daily reflections of his/her learning process in respond to a question given by the facilitator. The RJ question asks students to be reflective about their learning and development. The self-evaluation consists of 8 items inquiring about the quality of students' performance within their teams. The peer evaluation consists of 4 items inquiring about the cooperativeness and quality of contributions of peers within the team. Students are asked to respond to these items on a Likert five-point scale ranging from "strongly agree", "disagree", "neutral" and "agree" to "strongly agree".

Instrument

An 18-item questionnaire was designed to measure four belief categories derived from past research studies on the use of journals in higher education: (1) journal writing enables students to think and write reflectively, (2) frequent journal writing improves learning, (3) the RJ as an impression management tool, and (4) the RJ as a tool to feedback on teamwork. The items were rewritten and refined several times before they were administered to students, who were asked to respond to these items on a Likert five-point scale ranging from "strongly disagree," via "disagree," "neutral" and "agree" to "strongly agree."

In their work, O'Connell & Dyment (2006) suggested the usefulness of the journal as a learning tool to encourage and record reflection in learning. An example of an item reflecting the usefulness of the RJ which helped students to think and write reflectively was "Writing the RJ enables me to explore what I have learnt in my modules and my own ideas about these subjects." In her work, Kerka (1996) proposed

that the RJ helped students to improve on their writing skills, and students wrote about their peers' contributions towards team work in their journal responses. The use of the RJ by students as a feedback channel to their teachers about teamwork was represented by items such as" I write about the contributions of my team mates in my RJ." In another study, Lew & Schmidt (2007) reported that frequent journal writing improved students' learning and this construct was represented by items such as "Writing the RJ changes the way I learn." Students used their journals to manage their teachers' impressions of them. Items reflecting the usefulness of the RJ as an impression management tool were for example "I can make myself look good in front of my tutor through writing a qualitatively good RJ."

Procedure

The questionnaire was administered online to the participants at the start of the 2007-2008 academic year in April. Instructions for the questionnaire stated that there were no right or wrong answers to the items and that all answers were correct so long as they reflected students' opinions. No information was given regarding the constructs underlying the questionnaire. Filling in the questionnaire took approximately two to three minutes.

Analysis

Data collected were analysed using a structural equation modeling approach to test whether the underlying structure fitted the belief categories derived from the literature. The results showed a poor fit between the four constructs and their items. The chi-squared value accompanied by degrees of freedom, sample size and p-value were: $\_^2$ (127, N = 327) = 546.22, p < .000, CFI = .81, and the root mean square error of approximation (RMSEA) value of .10 (Byrne, 2001; Hu & Bentler, 1999). To maximise the fit between the items and their underlying constructs, the model was modified by examination of the item's modification indices (Byrne, 2001). This exploratory analysis resulted in the elimination of 3 items with high modification index values. The deleted items often let room for multiple interpretations, or were mere replications of other items. The resulting model contains 15 items and four underlying constructs. Responses to negatively stated items (n = 2) were reversed so that for all items the highest response score was indicative of a positive rating of each construct. The resulting questionnaire model with was tested with confirmatory factor analysis. Parameters for the model specified were generated using maximum likelihood. The means and correlation coefficients of students' responses on the questionnaire scales were also computed.

Results and discussion

Analysis of the questionnaire model resulted in a CFI value of.97 and RMSEA value of .05. These values suggest a good model fit (Byrne, 2001; Hu & Bentler, 1999). Results of the $\_^2$ analysis was $\_^2$ (81, N = 327) = 134.80, p < .00. The calculated constructs reliability values (coefficient H values) of the model (see Table 1) range from 0.79 to 0.95, which reflected good construct reliability (Hancock & Mueller, 2001).

Table 1 also contains the mean students' responses for the four underlying constructs of the questionnaire. On the whole, students indicated that they agree to the greatest extent on the value of the RJ on their learning as enabling them to think and write reflectively. Students agreed to the least extent on the frequency of writing to write their journals everyday as a means to improving their learning.

Table 1: Questionnaire descriptive scale statistics and reliability coefficients H

Questionnaire construct	Mean (SD)	Coefficient H
The RJ helps me learn to think and write reflectively.	3.50 (0.76)	0.94
Frequent journal writing improves my learning.	2.98 (0.47)	0.89
I can look good in front of my tutor when I write a qualitatively good RJ.	3.40 (0.71)	0.89
The RJ enables me to feedback to my tutors about my peers' performance.	3.17 (0.88)	0.79

The correlation coefficients among the four questionnaire scales are contained in Table 2. It can be seen from this table that the four constructs underlying the questionnaire were positively correlated and statistically significant. This suggests that students, who believed that the journal writing enables them to think and write reflectively, also believed that frequent journal writing improves their learning. Furthermore, these students also believed that the RJ can be used as an impression management tool, and as a means to feedback on teamwork. There are three possible reasons for these findings. First, students have to reflect on their process of learning and development, and document these reflections in response to the RJ question. Furthermore, when grading the journals, facilitators will provide daily feedback online to students regarding their classroom performance, their learning development over time, their

interpersonal behaviors within their teams, and on suggestions on ways to attain their learning goals. Through the frequent feedback given by the facilitators which is readily accessible to students via the web-based eLearning platform, students can become better aware of their learning strengths and weaknesses, thus enabling them to take steps to further improve. Second, students believe that their journals are used by their facilitators to some extent, to derive their daily grades. As such, they write about their learning achievements (instead of on their learning process) and assume that their facilitators will grade them according to how much content they learnt. Third, students write about their peers' contributions towards teamwork in their journal responses because they want to elaborate on how they assessed their peers' performance, and to justify their own performance for the day which might have been affected by team dynamics.

Table 2: Correlations among the four questionnaire scales

Questionnaire construct	1	2	3	4
1. The RJ helps me learn to think and write reflectively.	-			
2. Frequent journal writing improves my learning.	0.72**	-		
3. I can look good in front of my facilitator when I write a qualitatively good RJ.	0.47**	0.25**	-	
4. The RJ enables me to feedback to my facilitator about my peers' performance.	0.35**	0.21**	0.43**	-

**Correlation is significant at the .01 level

Conclusion

The results of the study indicate that the questionnaire was able to measure students' beliefs about the value of journal writing to improve their learning. Students were able to identify the different factors underlying the questionnaire, as indicated by the fit of the hypothesised model. Construct reliability values of the four scales gave evidence of good reliability in terms of internal consistency. Factor correlations show that students' beliefs about the usefulness of journal writing in enabling students to think and write reflectively are related to their beliefs about improving learning through frequent journal writing, and the use of the RJ as an impression management tool, and as a means to feedback on team work. The use of online reflection journals (and hence ICT) provides many opportunities for students to reflect on their learning, and for facilitators to monitor students' progress through their reflections. Facilitators can provide specific, detailed feedback to aid students in improving their learning.

Two issues present themselves for further research based on the findings from these studies. First, the questionnaire model should be tested into new, independent samples to investigate if its factor structure replicates across independent samples of the same population. The questionnaire model should also be tested for test-retest reliability. Second, further research should investigate the predictive validity of the questionnaire with respect to academic performance. If beliefs such as the ones measured with the present questionnaire about journal writing contributing to learning, then their influence should be reflected in student achievement.

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