

Development and implementation of Reflective Journals as an assessment tool

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Abstract— Reflective journals can be employed to enable students to record their thoughts and to consolidate new learning experiences and deep understanding of concepts. Reflective journals also broadly identify students' thoughts that can be improved and maintained to further progress their learning. In this paper, we outline how we developed a suitable reflective journal template and implemented a DEEP (Describe, Explore, Evaluate, and Plan) model relating to reflective journals that support student's deeper level of reflection and learning. Based on students' feedback, the concept is well received.

Index Terms—DEEP model, Management, Marketing, Melbourne institute of Technology, Networking, Reflective journal, Telecommunications

1 INTRODUCTION

IN Semester 1, 2014, for the first time, Melbourne Institute of Technology (MIT) students in a various disciplines (e.g., IT, Networking, Telecommunication Engineering, Marketing and Accounting) were asked to complete an on-line reflective journal as an assessable task. MIT has been using reflective journals as an assessment tool in some units. However an overall integrated approach to this kind of assessment is lacking. The current emphasis on graduate attributes focuses on the fact that students should graduate with necessary soft skills along with an understanding of basic knowledge, procedures, practical skills and the requirements of the assessments. These activities can be recorded in reflective journals. This type of assessment also helps in combating problems of plagiarism in assessments. Furthermore, reflective journals will allow MIT students to identify and improve their own skills regarding problem solving strategies.

An assessment task has been designed and implemented to test and measure students' understanding of reflective journals. In addition, this project involves the implementation of an on-line reflective journal, and investigates and analyses students' reflective journals as a means of assessment. It also has identifiable outcomes, and reports the results of student perceptions of the reflective journal.

The paper is structured as follows: Section 2 explores current ideas and debates relating to reflective journals. Section 3 discusses the existing models relating to the reflective journal. Section 4 outlines the design and implementation of the proposed model (DEEP) for reflective journals at MIT. Section 5 outlines the structure of the online reflective journal assignment for MIT students. Section 6 discusses the method of data gathering from students for this study. Section 7 illustrates the discussion of findings from this study. Section 8 concludes the paper.

2 REFLECTIVE JOURNALS

A reflective journal is "a collection of your thoughts, feelings, speculations, and maybe dreams. It is like a map of your learn-

ing journey" [1]. It is a tool for a person to critically self-reflect as they participate in the learning process. The area of critical reflection has been around for a long time in learning that features the individual understandings and experiences [2]. Boud et al (1985) have described it as the: "Reflection is a forum of response of the learner to experience" [3]. Reid (1995) has defined it as "Reflection is a process of reviewing an experience of practice in order to describe, analyse, evaluate and so inform learning about practice" [4].

Reflection has also been described as "periodically stepping back to ponder the meaning of what has recently transpired to ourselves and to others in our immediate environment" [5]. Critical reflection with an open mind and acceptance of responsibility develops to orient learning, sense of observation, thinking critically and analysis [9]. Additionally, reflection is a complex concept, which may disapprove previous thinking and triggers questioning skills, beliefs, and actions [6]. Researchers refer to the critical reflection as an important capability for students to develop and to contribute to greater depth of understanding and learning [10]. Reflection also allows students to express their emotions and outlooks that may form barriers to learning. However, reflection is difficult to write thoughtfully. Writing a reflective journal needs skill to develop, foster and refine.

A reflective journal is defined as the "written documents that students create as they think about various concepts, events, or interactions over a period of time for the purposes of gaining insights into self-awareness and learning [3]". It enables students to record their thoughts and consolidate new learning experiences, with respect to deep understanding of the concepts [7]. Reflective journals also discover thoughts on reflection as a process that can be developed and maintained to support their continuous learning [8]. They particularly help students: in personal and professional development. Reflective journal practices can provide opportunities for stu-

dents to demonstrate the extent of their concepts (ideas), techniques (or methods) to gather evidence across a range of known and unknown contexts and integrate the theoretical and practical learning materials as shown in the following Figure 1.

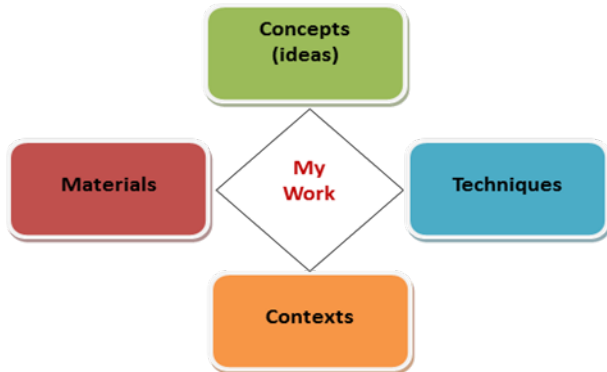


Fig.1: Reflective Journal Strategies

Reflective journals reinforce action oriented activities where students are able to correlate theory and practice with high level understanding. It can be related to a personal diary, but with deeper reflection and more formal thoughts.

Modular Object-Oriented Dynamic Learning Environment's (Moodle's) journal tool is an electronic journal where students can record their reflections. Moodle is open-source learning management software for producing internet-based courses and websites. In this project, students are encouraged to reflect on the subjects' content. Moodle has a feature to protect the privacy and the open-ended nature of the students' response a safe space to explore new knowledge.

3 MODELS OF CRITICAL REFLECTION

Researchers have emphasised the importance of proper- frameworks that encompass a structural process to guide students [16]. This section gives a literature survey, which explores models of critical reflection, considers ways to assist students to develop their understanding and provides a basis for doing reflective thinking. The models that are discussed below are: the Atkins and Murphy's model, the Gibbs' model, and the Kolb's Learning Cycle. These models can be outlined in the following Table 1 [11], [12], [13].

Model Name	Description
Atkins and Murphy's model (1994)	This model encourages the qualities, skills and attitudes of students and explicitly supports their deeper level of reflection required for reflective practice.
Gibbs' model (1988)	This model encourages a clear description of the situation, and incorporates all the core skills of reflection such as analysis and evaluation of the experience, and conclusion - a general and nonspecific approach

	to reflection.
Kolb's Learning Cycle (1984)	The model attempts to integrate thinking and practice, where students learn from experience. A student begins with the actual experience, reflects on observation and the experimentation, conceptualization of the idea, which leads to a transfer of learning from the current cycle to a new cycle.

However, Atkins and Murphy's model suggests that students may face negative or uncomfortable situations after reflecting their own experiences in practice. Gibbs model in general focuses on reflection on action, but it can be used for reflection before or during action. It may be difficult to plan for the future if reflection is before the action.

Kolb's Learning Cycle does not discuss the observation characteristics and reflection stage in detail. Therefore the model is not in depth and does not disclose the reflection process, which is the most important requirement in the cycle of learning from experience. In addition, the endless movement of the Kolb's learning cycle is difficult for students to follow [14].

Thus in order to present a clearer scheme of analysis, the authors presented a proposed DEEP model as shown in the next section, which integrates Gibbs' concepts and cohesions postulated by Kolb.

4 DEEP MODEL FOR DESIGNING REFLECTIVE JOURNAL FOR MIT

After careful consideration of existing reflective journal models, we have designed the DEEP (Describe, Explore, Evaluate, Plan) model. This model requires activities based on students' understanding, knowledge and skills, and then reflection of their understanding. The proposed DEEP model consists of repetitive cycles and is shown in the following Figure 2.

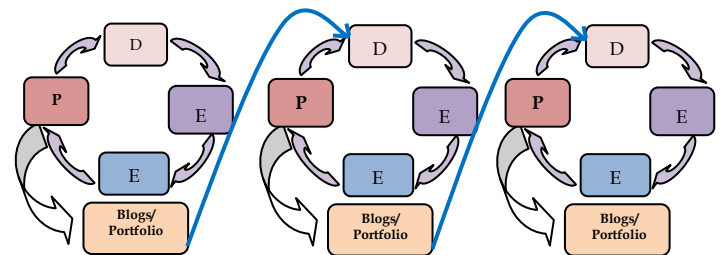


Fig.2: DEEP model (adapted from Kolb 1984, and Gibbs 1988)

The four-step DEEP model of critical reflection describes student's past/present experiences, explores and consolidates new learning, evaluates outcomes (i.e., good/bad), plans for future learning and records them in a blog, the most obvious technology for reflection for each cycle. A blog is a form of online journal and is usually organised in a chronological series of postings created by the user (e.g., student) of the blog

[15]. The model provides a practical approach to critical reflection for MIT students.

Describe (D) Experience (past/present)	Explore (E) and consolidate new learning	Evaluate (E) /analyse/self-reaction	Plan (P) future learning
What happened? What did I actually do during the learning process?	How does this relate to what I already know?	What I did not understand? Do I need to improve in any area? What are they?	Explore further what I like and plan for improvement on weaker areas? What goals do I need to set for next time? Or What strategies do I need to implement in the future?

5 ONLINE REFLECTIVE JOURNAL ASSIGNMENT FOR MIT STUDENTS

The DEEP reflective journal model was benchmarked with 3 Australian universities: Deakin, RMIT and UNSW to determine the journal assignment mark for MIT students. The assignment on the learning journal is worth 10% of the overall evaluation in some IT and Business units at MIT. Students are required to use a reflective journal that records their learning experiences and industry exposure, with respect to deep understanding of the concepts and they maintain them in a systematic way. Additionally, MIT is planning the integration of a reflective journal throughout the programs in the next semester.

MIT students have been implementing the reflective journal in some of the units since semester 1, 2014. In order to manage students' journal writing, a special blog in Moodle has been created. All enrolled students are required to submit/upload their reflective journals on Moodle on a weekly basis and their journal entries are automatically published in eBlogs. Each student was required to submit ten topics online during semester 1, 2014. At the completion of the weekly class, students were asked to write a journal entry as outlined in the DEEP model and to keep a student log book. Students must nominate the three best writings in the final submission. As long as the response was thoughtful and considered, students received 3% for each of their best writings as they complete a journal entry, up to a maximum of 10%.

To assess student awareness of this new on-line reflective journal, it was decided to undertake a formal student evaluation in semester 1, 2014.

6 METHOD

As a web (Internet) survey was the primary method of data gathering for this study, questions were carefully designed to provide adequate coverage for the purpose of the research. Major ques-

tions were based on the DEEP model and stage 1 competencies mapped to activities. This study collected quantitative data online and applied different types of analysis such as univariate (i.e., descriptive statistics) analysis.

A self-administered web questionnaire in the educational context was used as the primary technique for this study. During the online questionnaire development, particular attention was given to its design features due to the highly visual nature of the web environment, the variety of students' technical skills, appearance, different web browsers, colour variations, text appearance and screen layouts, as an inappropriately designed questionnaire can lead to increases in measurement errors [17]. The questionnaire was developed in the form of multiple choice statements and the choice of answers to the questions is was fixed (close-ended). Students' satisfaction and quality of online journal was measured using a 5 point Likert-type scales [18].

However, web surveys have a number of potential shortcomings, which includes non-widespread access to Internet, bias of responses, differences in capabilities of respondent's to technical problems, and lack of security [19].

The online questionnaire was approved by the Human Ethics Committee of MIT and the questionnaire is shown in the following Table 2.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I did understand the importance of Reflective Journal.	1	2	3	4	5
It was easy to write 'Describe' section.	1	2	3	4	5
It was easy to write 'Explore' section.	1	2	3	4	5
It was easy to write 'Evaluate' section.	1	2	3	4	5
It was easy to write 'Plan' section.	1	2	3	4	5
It helped me to identify my strengths from Reflective Journal.	1	2	3	4	5
It helped me to identify my weaknesses from Reflective Journal.	1	2	3	4	5
The Reflective Journal has changed my approach to problem solving in learn-	1	2	3	4	5

ing					
Reflective Journal is useful to show to the future employer (or during interview)	1	2	3	4	5

An online survey was conducted among MIT, students with reflective journal assignment, aged 18 and above in May 2014. The Internet survey was undertaken using the survey website or web link, <https://www.surveymonkey.com/> attaching a participant (i.e., student) information sheet from the researcher and consent (form) being given before completing of the online questionnaire by each student. Students were advised that their participation was voluntary and responses were treated as strictly confidential and were to be used for academic research purposes only. Data collected from students have been kept confidential.

The questionnaire attempted to identify the main influences of decision making about the use of an online reflective journal. It also tried to capture gaps between students' expectations and outcomes of reflective journals. The online questionnaire was designed based on objective judgment, to achieve a high level of reliability and accuracy. Response data were collected from the students in numerical format. The researcher used MS Excel 2010 to perform the descriptive statistical analyses [20].

31 students (Bachelor students = 20, and Masters students = 11) finally completed the questionnaire and are included in this study.

6.1 Data Preparation Procedures

The researcher had undertaken data preparation before analysing the survey questionnaire. This task was divided into two stages. The first stage consisted of editing, coding and converting the raw data into variables such as journal strength and weakness. Secondly, the variables were checked for normality and linearity to satisfy the assumption of the statistical tests undertaken. The researcher collected initial data through a MS Excel file from the web server (Internet), which contained both the information (e.g. variable names) and data values associated with the file. The researcher examined student data using a number of interpretations to find links between the research objectives and the outcomes with reference to the original research questions. Finally the researcher cleaned the data prior to the analysis as the data preparation stage is very important in identifying invalid cases, variables, and values, missing data and more accurate data for analysis. Employing the quantitative method gave the researcher an opportunity to follow the original set of research goals and state the research problem in very specific and definable terms. It helped the researcher to specify the dependent and independent variables and tested the outcome more precisely and clearly.

6.1 Data Analysis

During the analysis process, the researcher remained open to new opportunities and insights. The quantitative method of data collection and analysis techniques gave the researcher an opportunity to triangulate data to strengthen the reliability of findings and conclusions. The researcher then used different analysis tactics to move beyond initial impressions to improve the accuracy of the research findings. A data set was created using MS Excel 2010 prior to the data analysis. The data analysis was carried out by examining, categorising, tabulating and recombining data to address the purpose of the study [21].

7. DISCUSSION AND FINDINGS

A number of interesting findings were derived from the student data analysis mentioned in the above section.

Table 3: Summary of students' survey results

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
The Reflective Journal is important.	10	11	2	4	4
The 'Describe' section was easy to write	7	19	2	2	1
The 'Explore' section was easy to write.	7	14	6	3	1
The 'Evaluate' section was easy to write.	5	11	8	4	2
The 'Plan' section was easy to write.	7	16	3	4	1
The Reflective Journal helped me to identify my strengths.	8	13	4	4	2
The Reflective Journal helped me to identify my weaknesses.	9	10	4	5	3
The Reflective Journal has changed my approach to problem solving in learning.	7	12	5	3	4
The Reflective Journal is	8	9	6	4	4

useful to show to a future employer (or during an interview).					
Total responses = 278	68	115	40	33	22
% of total responses	25	41	14	12	8

From the above table, we can conclude that a majority (66%) of the students agree or strongly agree that overall reflective journal is helpful for them. Since this is the first time MIT asked students to work on the reflective journal, 34% of the students did not agree or were neutral. Our next task is to educate students from the start of their course, so that they can improve on this as they progress.

8. CONCLUSION

Reflective journals enable students to record their thoughts and consolidate new learning experiences, with respect to deep understanding of the concepts. It is now part of the capstone projects assessment in IT, Engineering and Business courses at MIT. MIT is planning the integration of a reflective journal throughout the programs. In this paper we have outlined, and designed a DEEP model strategy to explore students' thoughts on reflection as a process that can be developed and maintained to support their continuous learning. Additionally, the DEEP model is embedded into the students' curriculum that can provide overall success of such a strategy.

The authors have shown the implementation of such a model for reflective journals in various units at MIT. Also, implementation of reflective journals assignment allows students to reach a higher level of correlation between theory and practice. Like personal diaries, it encourages reflection by forcing students to write down their thoughts and reflections about a topic. In order to manage students' journal writing, a special blog in Moodle has been created so their journal entries are automatically published in eBlogs.

Reflective journals can be submitted as simple word documents. However a preliminary review of current literature shows that reflective journals work well as part of e-portfolio systems. So, one of our aims could be to investigate such a system such as Mahara open-source software, which can work in conjunction with Moodle.

Finally the implementation of such e-portfolio system could be an interesting area of future research.

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