

Group Online Collaboration For Scholarly Articles Readability and Understandability: SOAR

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Abstract

Challenging scholarly articles are not easy to read and understand by learners. Our previous work shows an innovative learning framework –SOAR (Scholarly Article) validated on a group of learners without research experience on improving their comprehension skill on scholarly articles. In this paper, we present additional result after validating SOAR on novice learners who first time read scholarly articles. SOAR is based on a theory of Brown's et al, emphasizing the importance of collaborating and sharing educational knowledge, so that various scholarly articles can be understood faster and more easily by students, researchers and academics. It places heavy emphasis on research, its integration and incorporation within learning activities, and on allowing learners to build their research, analytical and critical review skills. It is based on the concept of scholarly articles as the key subject context integrated within courses as part of a test assessment or a tutorial-based activity in an e-learning environment, as an alternative approach for maintaining educational sustainability. In turn, the aim of this framework is to help learners understand scholarly articles by encouraging them to collaborate and discuss challenging issues online with other global learners and, through the appropriate use of a tool for collaboration, to generate inventive and innovative ideas.

1. INTRODUCTION

Educators, researchers and learners are the three largest consumers of scholarly articles. Educators use scholarly articles for teaching and research purposes; learners and researchers use them for learning and gaining knowledge. Different educators have different expectations from learners when using scholarly articles in their teaching. Some educators focus on writing and expect learners to write a summary after reading a scholarly article, thereby learning how to write a short version of a research paper and providing evidence for assessment of the learner's writing and analytical skills.

Other educators are more interested in evaluation, asking learners to critique scholarly articles to test learner's understandability. Other educators interested in enquiry expect learners to answer questions relating to scholarly articles to test their critical analysis and problem solving abilities. Yet others want learners to read scholarly articles to elicit and share ideas with other learners. Although none of these approaches is a "bad" technique, they all lack guidance for learners in how to tackle the difficult task of reading and understanding scholarly articles.

Comprehension is an essential skill that learners (readers) must possess. Unfortunately, it is especially difficult to develop and cultivate comprehension while carefully reviewing or studying somebody else's research especially for a learner who does not know the researcher work. In this paper, we introduce the Scholarly Articles (SOAR) readability and understandability framework. It is useful for students who are taking a research subject, or a

subject with a research activity as a component. The utility of SOAR does not only reduce the reading time of scholarly articles, but helps readers overcome their comprehension difficulties, through online collaborations and oral presentations on scholarly articles. In addition, other soft skills – such as critical and analytical thinking, building and sharing of knowledge and research – can be improved when theory and practice are integrated.

The SOAR framework was validated from 2008 to 2012, via compulsory use in courses where students required an online system for learning support. Some results [1,2,3,4] showed that the framework contributed significantly to postgraduate students' learning: 1) Delivering a positive impact on the development of students' critical thinking, innovation, presentation and team collaboration skills through brainstorming on various problems drawn from the articles; 2) Inducing a decline in the assessment failure rate in which students summarised scholarly articles in subjects with an emphasis on integrating state-of-the-art understanding and state-of-the-practice understanding for undergraduate students; for an example the theory of teamwork applying in real world contexts. 3) Helping students understand how academic writing differs from contemporary writing, thereby helping them develop their own writing style; and 4) Letting students maximise their thinking space by guiding them to view problems from different perspectives and innovate creative solutions.

The testing and validation of the SOAR framework is further extended in this paper to include first-time undergraduate and research students with no prior experience in literature review, where the process can be of value in helping them read and comprehend more scholarly articles over a shorter period of time. The paper is structured as follows: 2) related work; 3) the distinction between concepts of learning and collaborative learning; 4) framework introduction; 5) the framework process; 6) summarises the students' learning outcomes; 7) students' feedbacks and the last section provides a reflection of the research and future directions.

2. LITERATURE REVIEW

Since the launch of open source software, many E-learning tools have been developed voluntarily through developer collaboration. Western countries are adopting E-learning faster than eastern countries, according to a European survey report [5]. Large European organisations and universities have progressively moved forward incorporating e-learning in education and training. Thus, huge investment costs in E-learning are expected. To stay competitive, many e-learning suppliers and designers internationally aim to produce high quality e-learning systems [6,7].

One of the challenges in designing e-learning systems faced by designers and developers is the lack of intuitive content and difficult to incorporate interactively. Many educators emphasise high content-based materials on e-learning systems [8,9,10,11], possibly reflecting a traditional perspective that teaching is based on learning concepts first then tackling the application of what is learned. Unfortunately, in reality, not all learners can solve problems even if they know the relevant concepts well [12]. This is potentially due to the lack of an integrating cognitive learning process to connect concepts and problem-solving [13].

For educators to be competitive at the technology cutting-edge, a research component is strongly encouraged to be integrated into any e-learning courses. Research drives innovation; consequently new technologies push to improve our lives through newly-created products,

processes and services. In other words, learning is not an act, a process or an experience of gaining knowledge and skills; it should be a lifelong process of transforming information and experience into knowledge, skills, behaviours, and attitudes.

The goal in this paper is to seek a way to enhance learning to be as effective as possible to encourage learners to learn widely and deeply beyond a “concepts-only” level. An objective to support this goal is based on the constructive, guided learning SOAR framework.

3. CONCEPTS OF LEARNING AND COLLABORATIVE LEARNING

What is learning? Numerous philosophers [12,13,14,15] view learning as based on the following sequence:

1. To increase one’s knowledge;
2. To memorise and reproduce,
3. To apply,
4. To understand,
5. To see something in a different way,
6. To change one’s thinking.

Learning helps learners to develop cognitive skills such as reading, understanding, thinking, memorising and applying [12]. Collaborative learning is an extension to the concept of learning. Collaborative learning goes beyond the acquisition of knowledge by identifying the strength and weaknesses of a group; for example, while some people are good at understanding theory, others might be better at understanding the social aspect of a subject, and how to better communicate with a wider audience. One could consider different roles within a group, such as: leader, experts, and communicators, where people could play different roles in each discussion, to promote the dissemination of points of view [1,15].

4. FRAMEWORK

The framework aims at improving students’ research, collaborative and presentation skills. Importantly, the framework also aims at improving students’ critical thinking ability to assess scholarly articles and to draw innovative ideas of their own. The design of this framework (Figure 1) relied on the educational theory developed by Brown et al [15], which aims to foster a circle of educational knowledge building and sharing [16]. Figure 1 shows the SOAR framework of scholarly articles as a subject component and as an input. The framework creates an educator’s thinking space in which to decide whether to use scholarly articles as 1) a class activity, 2) a test assessment or 3) whether to integrate it and remix into a tutorial.

The SOAR framework shows both educators’ and students’ interest and the differences in their thinking space on scholarly articles. Students’ thinking space in particular is needed to develop their research skill, and analytical and learning (critical thinking) skills on different scholarly articles. Using the SOAR framework can strengthen students to develop their critical thinking, improve their presentation skill, and collaborate with other peers.

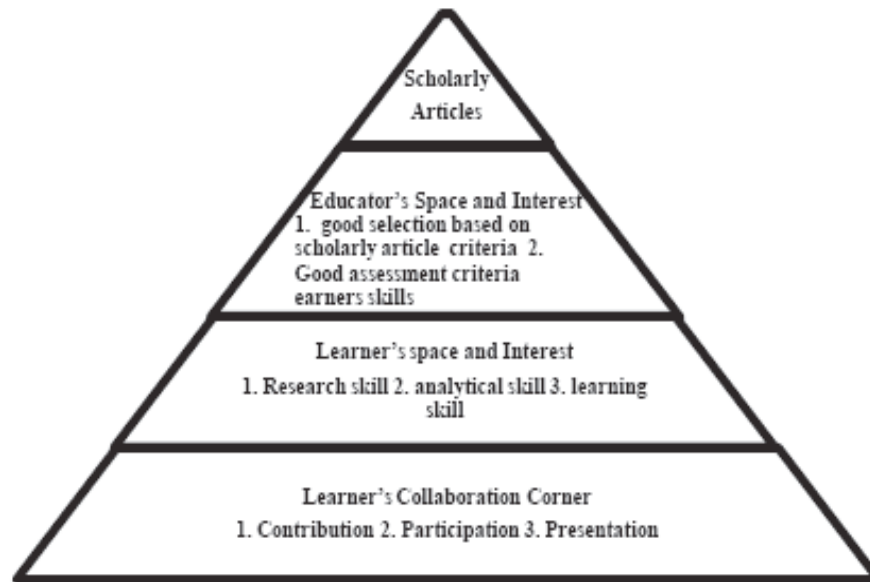


Figure 1 SOAR Framework

The SOAR framework's contributions include:

- a) Helping students understand scholarly articles. The author of this paper is the subject coordinator of undergraduate and postgraduate subjects that introduce concepts of information systems strategy place a heavy emphasis on theories focusing on understanding the difference between the state-of-the-art and the-state-of-the-practice business strategy and change management. Many theories are developed based on researchers' expertise. Using SOAR students will gain a better understanding on how theories are presented and how they are relevant to the real world. They will also develop research skills by extensively working on these articles.
- b) Improving students' analytical and critical thinking skills through understanding how academic writing differs from contemporary writing, and develop a skill in building their own writing style in their attempt to bridge a practical and theoretical understanding of what they are reading.
- c) Motivating students to collaborate within and across teams and enhance teamwork by brainstorming on a set of problems drawn from the articles.
- d) Lastly, the framework guides students into maximising their thinking space by helping them develop ideas that can help them look at problems from different perspectives and innovate creative solutions.

5. FRAMEWORK PROCESS

The framework was validated in three postgraduate classes in 2009, 2010, 2011 and two classes in 2012 of one postgraduate subject and one undergraduate subject. Each class was approximately 20–60 students and each collaborative group was comprised of 3–5 students depending on each semester enrolment intake. To validate this practice-based framework, two stakeholders were required, i.e. educators and learners, a subject input, scholarly

articles and a tool to support learners' collaboration and participation. Without an appropriate e-learning system, managing scholarly articles for a large class size would be difficult, especially if critical discussions and online participation are required. It is essential to have a learning tool to test the framework.

The framework consists of the basic procedure and steps below which are not difficult to follow: an educator creates his or her thinking space to decide where to use scholarly articles when using an e-learning system. He or she asks whether it is for 1) a class activity, 2) a test assessment or 3) to integrate it and remix it into tutorials. Table 1 shows steps and dimensions of the soar framework.

Table 1. Steps and Dimensions of the SOAR Framework

Step	Dimension
1. Educators create a subject folder for materials to be uploaded to an e-learning system	Educator's thinking space and interest: <ul style="list-style-type: none"> • Good selection based on scholarly article criteria • Assessment criteria to evaluate learners' skills
2. Every topic is attached with a document, <i>e.g.</i> , a scholarly article for learners to download and read and assessment criteria attached for completing the task	
3. A group discussion board is created for learners to discuss weekly papers	
4. Learners are assigned to read weekly scholarly articles	
5. Learners upload their questions which relate to the industry context with reference to the paper	Learners space and interest <ul style="list-style-type: none"> • Research skill • Analytical skill • Thinking skill
6. Learners can upload their questions to the discussion board	
7. Learners invite other learners on the same course to provide input and comments	Learners' collaboration corner: <ul style="list-style-type: none"> • Contribution • Participation • Presentation
8. Educators use their pedagogical skill and knowledge to review learners' research questions and other learners' comments as to whether they are valid or invalid. Educators can make comments to correct or clarify matters on the discussion board	
9. Learners are required to deliver a presentation online. In the presentation, learners must discuss the paper's topic and their questions relating to an industry case, and provide a summary or outline the statistics of other learners' comments on the questions asked on the discussion board	

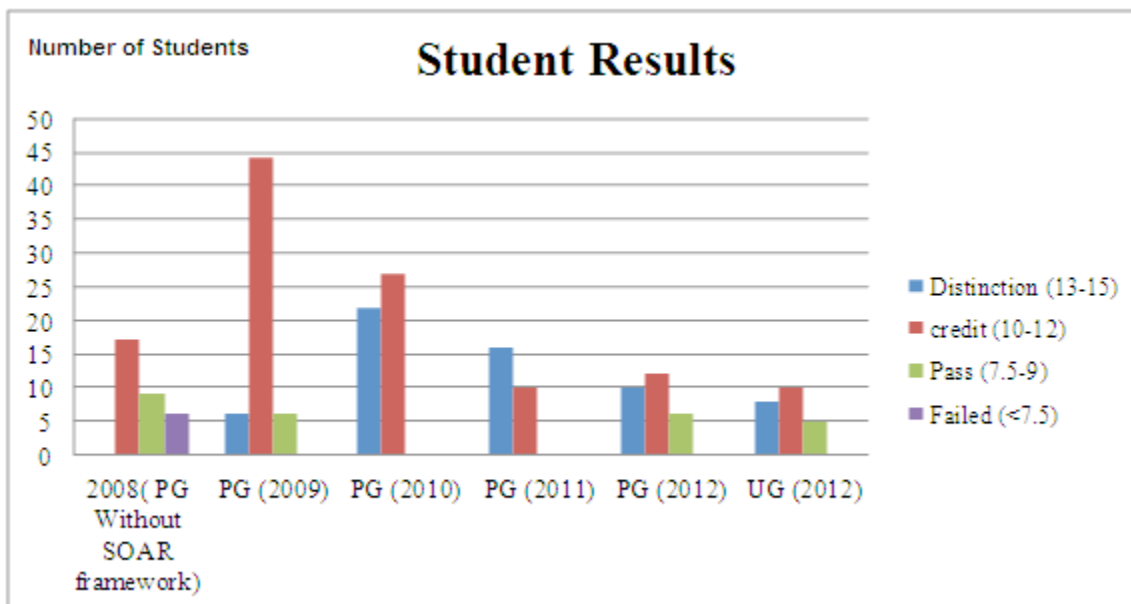
6. LEARNING OUTCOMES

We assessed students learnability using the marking template of an assignment which formed the basis of a metric to benchmark student's performance before (2008) and after

the SOAR framework was implemented in 2009, 2010, 2011 and 2012. In the marking criteria, a total mark of 15% is allocated to three sections which were divided into 5 marks for each section: 1) Knowledge of the material, including the relevancy of the article’s content broadly and in–depth; 2) Critique skill, for instance, the emphasis of students’ evaluations on their assigned papers and drawing out the papers’ weaknesses and strengths in relation to data, information and applied research methods; and 3) Collaborative and presentation skills on a topic of interest, the ability to interact and discuss with a clear and concise flow of presentation. Table 2 and Graph 1 show number of students in each class and students’ marks.

Table 2. The study sample, outlining numbers of undergraduate and postgraduate students who participated in the project.

Year	Number of students	
	Undergraduate	Postgraduate
2008	-	26
2009	-	56
2010	-	49
2011	-	26
2012	23	28
TOTAL	23	185



Graph 1. Students’ result before and after SOAR Framework

7. RESULTS - STUDENTS' FEEDBACK

The university has a standard survey for students to review subjects. To evaluate SOAR, we used the standard survey to develop a SOAR efficiency and effectiveness survey which was distributed to 23 undergraduate (UG) and 159 postgraduate (PG) students from 2009 to 2012 (Table 1). We applied content analysis approach [17] and used NVivo software [18] to analyse students' responses looking for similar comments. We summarised comments from UG and PG students into four categories: 1) article topics; 2) paper discussion; 3) questions posted on the forum; and 4) oral presentation.

All (23) UG students in 2012 made positive comments about the articles: *'Topics are current, significant, clear and interesting'*, *'good knowledge'*, *'It sharpened our thinking'*, *'Topics are thought-provoking'*. 98% (157) of PG students also felt positive: *'Topics give us business aspects of a technical field'*, *'They broadened our knowledge of IT strategies'*.

Regarding paper discussion, more than 80% of UG students found the session was *'informative'*, *'engaging'* and *'a lot of feedback'*. Some UG student feedback was similar to the PG student feedback, while other two UG students did not answer this section. PG students commented *'team dynamics were unique'*. Students agreed that the process involved two-way discussion and they *'enjoyed it'*. They also believed that such discussion helped them *'not only get to know each other better but also able to share my experience and knowledge within the group level and class level'*.

Regarding the questions posted on the forum, UG student surveys showed a dichotomy. 10 local students felt *'questions are a good help to think critically and relate to the paper and real life experiences but proper guidance on structure for writing question is important'*. However 13 international students commented *'As English is not our first language, our questions have not been proofread and non-presenters received wrongly interpreted our questions' meaning hence we get different answers from them'*. More than 80% of PG students, who are more advanced and mature, commented *'questions are challenging in some aspects and some further reading is necessary'*. Moreover, they found peers' questions did help them improve their critical thinking.

Despite over half the UG students struggling with written English, there were mainly positive comments regarding oral presentations. 50% of UG students reported they really enjoyed presenting as it was their first time presenting their ideas to a panel: *'We have no experience for presentation. We learn many useful tips how to make a good presentation from the subject coordinator'*. On the other hand, PG students, who may have been more experienced, had limited comments on the presentation. 98% of PG students felt presentations *'stimulated discussion in class and feedback from the subject coordinator'*. They also commented that *'there was a lot of information'* and *'argumentative and critical evaluation'*. They felt that they learned how to *'build oral communication skills, negotiation skills and analytical skills, as well'*. 98% of postgraduate students agreed that the presentation structure helped them to understand and improve reading scholarly papers.

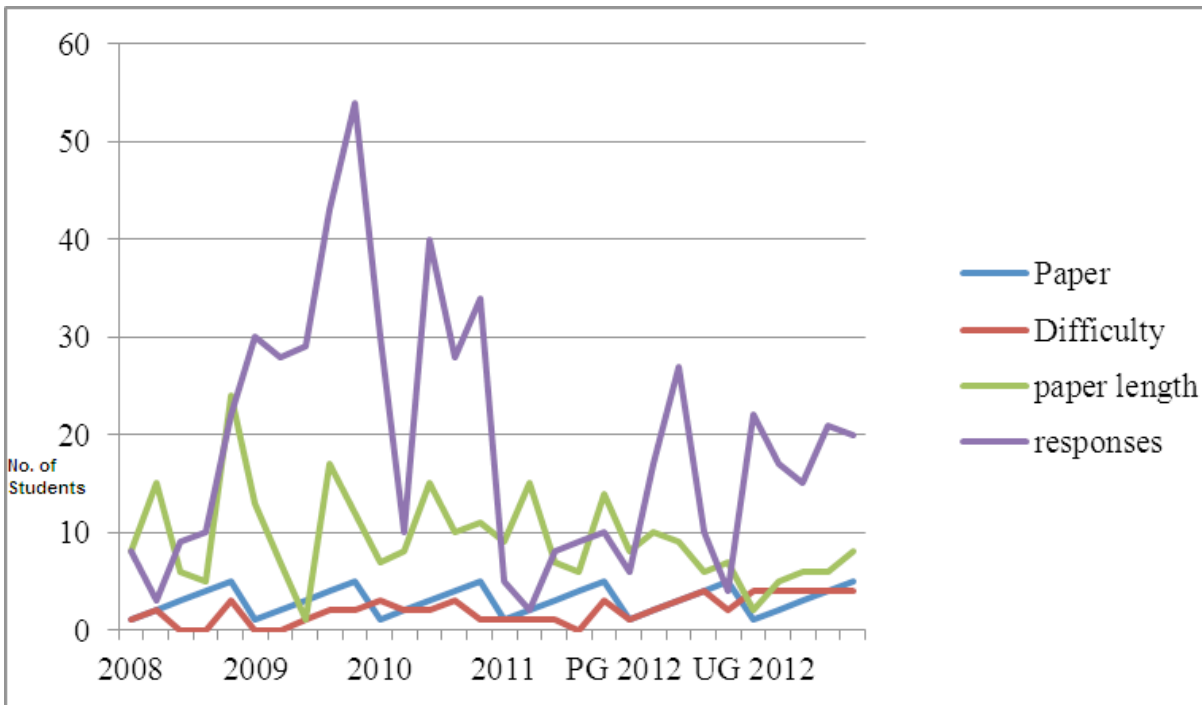


Figure 2 Articles Comparison

Interestingly, we did not find that difficulty or length of the papers affected students' interest in understanding the topics or their motivation in their course, for either UG or PG students. We also did not find any significant correlation between paper difficulty and length on learners' reading ability while using SOAR. Our findings therefore show that paper difficulty and length were not relevant to achieving better learning outcomes according to our sample of volunteer participants (Figure 2).

8. CONCLUSION AND FUTURE WORK

Based on the positive feedback we received and the academic outcomes of the students, we are confident that the SOAR framework can assist educators and students to achieve good learning outcomes. From our data analysis, SOAR can be used with both undergraduate and postgraduate students. However, a development workshop on language and communication skills must be given to undergraduate students to improve their writing and speaking, especially students for whom English is not their first language. Further work will continue to validate SOAR in other subjects, faculties and universities to evaluate effectiveness and efficacy.

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