Meta-analysis on Interaction in Online Learning

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Abstract: Interaction in education is defined as direct effect that influence students, instructors and contents in promoting students' achievement in learning. Interaction is not only face-to-face between teacher and students in classroom; rather, interaction between a teacher and students is mediated through technology in an online setting. Previous research has identified that there is still lack of empirical research that show how one should arrange online interactions content to improve meaningful learning during online interaction. Therefore, the purpose of this meta-analysis is to investigate the types of interactions that occur in online learning together with its importance in an online setting. As the conclusion, results from the previous research show that, interaction plays an important role by engaging students actively in online learning.

Keywords: Interaction, learning environments, online learning

1. INTRODUCTION

The word online learning is often used including various teaching practices that may actually be very different in terms of learning objectives and the outcomes. In general, online learning is a form of training courses conducted via the Internet. About 80% or more of the content of the course is delivered online nowadays as proposed by Allen and Seamen [1] in their online learning typology. In some cases, a different definition of online learning was adopted in order to represent local administrative practices. For example, Jaggars and Xu [2] used a database in which online courses were defined as those where at least 95% of the content was taught asynchronously. The sense of connectedness or community among the students increased the interactions through an online learning environment [3]. However, in this 21st century, the term online learning can be described as delivering educational content through social media, Facebook as an example.

Particularly, interaction has been viewed as a major part of the educational experience because of the role of the interaction between students, teachers, and content is presumed to play in all of formal and informal education [4]. Other researchers also do agree that interaction has been examined as a fundamental element for quality learning environment in multiple studies [5, 6, 7, 8]. Many studies about the concept of interaction in online learning are based on Moore's [9] three types of interaction which are learner-content, learner-instructor, and learner-learner interaction.

2. INTERACTION IN ONLINE LEARNING

This study examined the nature of online learning via the theoretical construct of interaction. These online interaction contexts should enable: (1) student-student interaction, (2) student-instructor interaction, (3) student-content, (4) student-interface interaction, and (5) student-self. [9, 4, 3, 6, 10, 11].

Students learn better when they interact with instructor, other students, and subject content either in traditional classroom or online learning environment. Interaction between students and technology has been highlighted especially in an online learning environment. The effect of interaction on both traditional and online learning have been explored and researchers have consistently found interaction as a core fundamental for successful learning experience within either the traditional classroom or the online learning environment.

Interaction could provide various purposes within the online learning environment. For example, some studies explored the nature of interaction in an online course and noted that a combination of the learner-content, learner-learner, and learner-instructor interaction along with an instructor-led analytical model, increased the level and patterns of interaction on students [12]. Research studies by He. W [13] revealed the difference as well as similarities in students' pattern of participation between online questions (student-instructor interaction) and online chat messages (student-student interaction). Students were more active in interacting with their peers than with their instructor. While, other studies indicate that students' online learning performance can be influence directly or indirectly by using interactive function in the learner-instructor and learner-learner dimension [14].

3. METHOGOLOGY

This meta-analysis is intended to identify the types of interaction in online learning and their importance in online learning. These key words were used to search for related articles and journal: interaction, learning environments, online learning, online education, social interaction and types of interaction. The researcher search through it all via Science Direct, EdITLib, IRRODL, SpringerLink, and via IEEE Xplore Digital Library. From the search, approximately 11 articles were believed suitable to the study following the criteria: the studies concern specific types of interaction that enhance students in learning and the studies must be published between 2009 and the present. As presented in Table 1.0, the meta-analysis of studies of interaction in an online learning were summarized.

As shown in Table 1.0, most studies involved students in higher education and secondary schools. Interaction that implemented in these studies vary across different practices (CMS, forum, online discussion and Facebook). These studies have generally mapped out various types of interaction on students' performance, particularly in online learning. The following section is the detailed results.

Table 1.0: Meta-analysis on Interaction in Online Learning

Author(s)	Research Purpose	Interaction Types
Moore et al. [9]	To study the interaction among educators.	Student-instructor Student-student

		Student-content
Rhode [15]	To explore the dynamics of interaction within a self-paced online learning environment	Student-instructor Student-student Student-content
Bernard et al. [4]	To examine the evidence on the effects of three types of treatment Interaction in Distance Education in relation to the results achieved	Student-instructor Student-student Student-content
Meeuwisse, Severiens and Born [16]	To investigate model that describes the relationship between the learning environment and student interaction with teachers and peers, a sense of belonging, and achievement in study.	Student-teacher Student-student
Balaji and Chakrabarti [3]	To analyze the effectiveness of an online discussion forum in student learning.	Student-instructor Student-student Student-content
Chou et al. [6]	To explore the interactivity of the course-management systems (CMS)	Learner-interface Learner-self Learner-content Learner-instructor Learner-learner
Cho. T [17]	To study the interaction of learner-interface and identify the relationship between online interaction and learner satisfaction	Learner-interface
Zydney, deNoyelles and Seo [18]	To determine the effectiveness of using an online protocol in an asynchronous discussion forum on students' interactions.	Learner-instructor
Jumaat and Tasir [10]	To identify the type of student online interaction through discussion on Facebook	Student-instructor
Sarapin and Morris [19]	To investigate instructors' uses and gratification for instructor-student social communication on Facebook.	Student-instructor
Park et al. [11]	To identify the roles of a teacher and investigate the influence that her presence and discourse moves made on the involvement of students' in online discussions.	Student-teacher Student-student

4. RESULTS

4.1 Types of Interaction in Online Learning

Based on the meta-analysis, five main types of interaction in online learning were identified which are learner-instructor, learner-leaner, learner-content, learner-interface and learner-self. According to Chou et.al, [6], these five types of

interaction are considered as central to successful learning experience by engaging students actively in online learning.

Learner-instructor can be described as learner that interact with other instructors by using medium/materials provided by using CMS [9, 20, 21]. While, learner-learner is learner can interact with other learner by using CMS-based digital channel [20]. Learner-content, the learners can access multimedia learning contents in a CMS [9, 20, 21]. Learner-interface, learners can access desired information with a user-friendly interface in a CMS [20, 21] and finally, learner-self, learners can monitor their learning progress by reflection facilitated by CMS functions [20, 21]. According to Chou et.al, [6], these five types of interaction are considered as a central to successful learning experience by engaging students actively in online learning.

4.2 The Important of Interaction

The meta-analysis have explained the importance of interaction particularly in online setting. Interactions show the relations between learners and peers and instructor whereby they can share and exchange knowledge, hence, meaningful learning can be achieved. Meanwhile, from this interaction process, new knowledge can be constructed and reorganized along the process [22]. Song and McNary [23] made a conclusion that, students' interaction is always indispensable and a fundamental component of knowledge gain and cognitive development in traditional face-to-face learning setting.

Besides that, through synchronous and asynchronous learning applications, learners are able to gain knowledge and skills without the limitations of time and space [24]. Therefore, interactivity has been perceived as one of the most important parts of learners' successful learning experiences in an online learning environment [25].

5. FUTURE SUGGESTIONS

The interaction has been regarded as central to a successful learning experience with students that actively engage in online learning especially in social media, and it is also easier to get a chance to communicate with other students or lecturers. Therefore, future studies could investigate the learning outcomes, the relationship among students' perceptions of interactive function and frequency of students use of interactive functions in social media.

6. CONCLUSION

In conclusion, there are five types of interaction in online learning: learner-instructor, learner-leaner, learner-contentc, leaner-interface and learner-self that are important in enhancing student learning performance. It is undeniably that interaction in online learning is important to ensure the effectiveness of students' success in online learning. These proper types of interaction can influence the success of online learning.

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