The 9th International Conference on Cognitive Science

Towards identification of students' holistic learning process through Facebook in higher education

Mohd Nihra Haruzuan Mohamad Said*, Lokman Mohd Tahir

Faculty of Education, Universiti Teknologi Malaysia, Johor Darul Ta'zim, 81310, Malaysia

Abstract

This paper describes an approach for analysing the learning process that takes place in Facebook. The approach is based on a five-dimensional model that includes a participative, an interactive, a social, a cognitive and a value dimension. Each dimension comprises a set of indicators to be used to analyse students' interaction within Facebook. The proposed set of indicators, drawn from the literature and the researcher's field experience from a semester-long tertiary course with online participation, are discussed for each dimension. The paper also proposes value dimension integration in order to identify students' holistic learning process through Facebook in higher education.

Keywords: Social learning interactions, Facebook, Holistic learning process, Higher Education;

1. Introduction

Learning through online methods, specifically through the use of ICT, has increased formally and informally in schools, colleges and universities throughout the world [12]. This situation arises due to several factors. First, the coverage of Internet connectivity is widening, so permitting greater access to the Internet. To date the number of Internet users that have Internet access has risen to 34.3 % of the world's population, or roughly 2.4 billion persons [11]. This number shows that there has been a substantial growth in Internet usage each year which has led to extensive use of Internet applications (e.g. email and computer conferencing) for the exchange of information and knowledge in education [12]. Second, the emergence of web 2.0 as a result of the advancement of web technologies has had a great influence on learning online. In this regard, the use of open educational resources has flourished in that it provides educators with tools to create and share their works. Wikis, e-books, blogs and Social Networking Sites (SNS) are some examples of open educational resources embedded in web 2.0 that are widely used in education. The engagement of students with SNS has led them to be exposed directly or indirectly online [15]. In fact, many of the students have become involved in the social networking activities that require them to communicate, interact and broadcast casual information and knowledge [15].

Despite the benefits of engaging in the SNS (e.g. Facebook), there are negative repercussions of Facebook that are highly alarming. According to Krasnova et al. [13] previous research has linked consumption of social

---

* Corresponding author. Tel.: +06-07-553-3156; fax: +06-07-556-0542.
E-mail address: nihra@utm.my

information on Facebook to such undesirable outcomes as "jealousy, increase in social tension, social overload, isolation and even depression" (p.1). They further assert that envy could be the factor of negative consequences of following information of others on Facebook because unprecedented scale of information sharing on Facebook can provides a ground for envy. Previous research from social psychology reveals that envy may lead to frustration, mental suffering and even depression [30]. Considering values as one of online learning interaction dimension has the potential to balance the inappropriate social information produce by students as well as a healthy mental promotion [2]. According to Debra [2], mental health promotion is about optimising people's mental health and improving well-being for all people, regardless of whether they are currently well or ill. Thus, the integration of value dimension, social information consumption in Facebook can be analyzed through a set of indicators obtained by tracking students' behavior and interactions within Facebook.

2. Online Interactions via Facebook

Online interaction has been described as vitally important [15][23] and fundamental to the effectiveness of e-learning and distance education [15] as well as via Facebook [14]. Previous research describes the challenge of incorporating online interactions revolves around learners being separated physically from other learners and teachers, hence affecting their interactions in an online learning environment [29]. Some researchers believe that an online learning environment is lacking the traditional classroom's vital interactivity such as social and emotional interactions [3]. Interaction is also said to influence student retention and enhance student learning [1] as well as influencing the success or failure of an online course [16][29]. There are four types of interactions associated with online learning courses that may as well applies to Facebook, namely, learner-learner, learner-instructor, learner-content and learner-interface.

2.1. Learner-learner

The learner-learner interaction occurs when students interact with themselves or peers in order to complete the assigned tasks, reflecting the learning process as well as monitoring their progress in learning activities within an e-learning course [1][10][16][23] The learner-learner interactions as in inter-learner discussions are valuable as a way of helping students to think through the content that has been presented and test it by exchanging it with their peers [26]. There are numerous learner-learner interactions within e-learning environment can be applied in Facebook including providing access to alternative opinions and viewpoints, influence on motivation, anxiety and satisfaction, strengthening learning [17][27], but also with possibility to carry out peer-to-peer dialogues and foster the development of communication skills by sharing personal and professional interests and aspirations that usually excluded from e-learning environment [14].

2.2. Learner-instructor

Learner-instructor interactions within e-learning course are typified when the learner interacts with the instructor, whereby the instructor helps the learner to maintain his or her interaction with the topic; this includes motivating students to learn, assessing their progress, and providing appropriate support and encouragement [1][10][16][23]. The instructor can interact with students by posting questions, moderating and keeping the discussion on track, redirecting, and providing feedback to the contributions posted within e-learning forum discussion [6]. However, the learner-instructor interactions within e-learning environment are restricted to only enroll students in particular semester of the course. Through Facebook, learner-instructor can provide alumni support to manage the ups and downs of college life, or help with school-related tasks [14].

2.3. Learner-content

Learner-content interaction is the process whereby learners intellectually interact and access learning content in e-learning environment [1][10][16][23]. The interaction of learner-content occurs in the learners' "heads" while attempting dialogue, constructing meaning, answering questions, or finding the appropriate place to integrate incoming information with existing schema [1]. There are numerous learner-content interactions within e-learning

course related to educational purposes such as lecturer notes, coursework and assignments, links for activities and resources, online quiz and self-evaluation, and individualized learning [1]. However, there is a challenge such as obligation of instructors to protect students' privacy; conflict may arise when the context of formal learning is developed outside the boundary of institutional context [14].

2.4. Learner-interface

The learner-interface interaction takes place between the learner and technology to access information and content within e-learning environment [1][10][16][23]. According to Hillman et al. [10], the students must be able to interact with the technology before they can successfully interact with the content, instructor, and other learners. The interface potentially creates a 'wall' that restricts students' access to the learning environment and only when they can successfully 'break the wall' and go through the interface of the learning environment can they begin navigating and learning the course content [10]. Hillman et al. [10] argue that "regardless of the proficiency level of the learner, an inability to interact successfully with the technology will inhibit his or her active involvement in the educational transaction". However, according to Duffy [4], Facebook offers a set of affordances for online learning activities, because many students are already using them for socialization and communication and they would be willing to use it in learning.

3. Analyzing Online Interactions via Facebook

The online interactions transcripts that are generated from online activities are the primary source of documentation which is made possible by Facebook in which it records online activities that are occurred [14][32]. Previous researchers (e.g. [9]) argues that data recorded in the online transcripts are considered a "gold mine" which can be used to provide information regarding the psycho-social dynamic among students, learning strategies adopted, and the acquisition of knowledge and skills. The online interactions as evidence through Facebook transcripts can convey important information regarding distributed cognition of students' interactions over time in which their interactions can affect each other as well as develop from each other [5]. Facebook transcripts also provide evidence of a mixture of informal and formal data and relatively easy to use, accessible, and safe [14][32]. They are also easy to track and are usually administered over an extended timeframe which could give the researchers the flexibility to evaluate and monitor Facebook activities [14]. The approach of analyzing online interactions within Facebook is based on a five-dimensional model that includes a participative, an interactive, a social, a cognitive and a value dimension which elaborated upon as follows.

3.1. Participative dimension

The participative dimension categories are developed to include categories based on the level of participation determined through students' number of postings and viewings [18]. These categories are based on two types of indicator of students' active and passive participation. Active participation was measured through the number of postings students made in the Facebook discussion while passive participation measured the frequency of students viewing particular posts within online group Facebook discussion.

3.2. Interactive dimension

The interactive dimension categories are developed to include categories based on thematic units referring to physical aspects of the online communication such as the frequency of explicit and implicit (or collaborative) interactions, and independent (or cooperative) statements [18]. The research also considered the qualitative aspects of students' interactions by identifying students' ways of interacting online (such as used in this research: providing information, sharing views, sharing experiences, agreeing and disagreeing, posing questions, suggesting new ideas, giving feedback, and clarifying ideas) during the intervention activities [28].

3.3. Social dimension

The social dimension categories are developed to include categories based on thematic units characterized by affection and cohesiveness exhibited during communication in online discussions [18][19][21]. Thematic units characterized by affection include the use of emotional expressions (such as used in this research: emotion icons or emoticons) and thematic units characterized by cohesiveness including the use of social cues (such as used in this research: greetings, salutations, concern, encouragement, apology, jokes and humour, and thanking).

3.4. Cognitive dimension

The cognitive dimension categories are developed to include categories based on cognitive presence revealed by thematic units referring to (1) revelation (renamed as clarification) that is, recognizing a problem, explaining or presenting a point of view; (2) exploration (renamed as judgment) that is, expressing agreement or disagreement, argumentation, exploring or negotiating; (3) integration (renamed as inference) that is connecting ideas, making syntheses and creating solutions; (4) resolution (renamed as strategies) that is, reflecting on real-life application suggestions or references to real-life solutions [18][19][21].

3.4.1. Level of information processing

Additionally, the information processing (e.g. surface and deep) categories are developed to include categories based on thematic units referring to (1) surface learning that includes reproducing an approach (not wanting to understand the issue or finish with minimum of effort); or staying inside course boundaries (repetition of what is being discussed or required); or an unthinking approach (jumps to a conclusion with an uncritical acceptance of ideas); or fear of failure (focus on negative aspects of the coursework); or extrinsic motivation (more concerned about passing the assessment than learning); and (2) deep learning includes looking for meaning (focus on what is signified, asking questions to understand new information); or relating ideas (relating ideas to previous information or knowledge to generate new ideas); or using evidence (finding alternative ways of interpreting information or justifying with an example); or intrinsic motivation (desiring to learn more about the topics) [18][19][21].

3.5. Value dimension

The value dimension categories can be considered through students' personal values and culture values belief when postings in Facebook. These categories are based on thematic units referring to personal and culture values belief. Thematic units characterized by personal values (such as positive action/relationship, personal influence, personal interests and aspirations) and thematic units characterized by culture values (such as community/social identity, community/social influence, community/culture interests and aspirations) [14].

4. Overall Steps of Analyzing Interactions in Facebook

The overall steps of conducting the content analysis in this research begin with the postings of the students in Facebook within each group and close reading of each posting is established. Next, the researcher coded each unit of analysis starting with participative dimension followed by interactive dimension, social dimension, cognitive dimension and information processing (surface and deep), and value dimension. The researcher established the counting of the number of status/postings for each category in each dimension. In order to safeguard credibility and to validate the coding procedures, intra-rater and inter-rater coding are employed. Intra-rater is conducted by the researcher as 'coder agreeing with his self (coding) over time' [31]. This is done by running the coding multiple times before reaching coding stability. The inter-rater reliability (the ability of multiple and distinct groups of researchers to apply the coding scheme reliably) is also conducted between two independent coders agreeing with each other [31]. Guidelines for coding are formulated stating clearly what comprises a unit, and descriptions of all categories. Two Malaysian PhD researchers are asked to help with the coding. Before they conducted the coding process, the guidelines and instructions are introduced to them. A one-hour training session is held during which these guidelines are explained. After that, one transcript from each mode of discussion was randomly selected

(altogether totalling approximately 10% of online group discussions) and coded separately by the two coders and they then compared their results. The result across all categories is verified using a Cohen's Kappa test value. According to previous researchers [26][31] 0.75 to 0.40, represent good to fair agreement beyond chance. This study's 0.81 Cohen's Kappa value for the consistency of inter-raters' agreement can be considered highly reliable [31]. Finally, the analysis of types of engagement within each online group Facebook discussions is conducted. Four types of engagement are pre-identified from the literature instead of emerging from the analysis of the students' interactions. However, there is considerable consistency and relationship between the categories of analysis of students' participation level and their ways of interacting online in the online discussion during the intervention based on the overall triangulation of data. An example of the overall analytical process is depicted in Fig. 1.
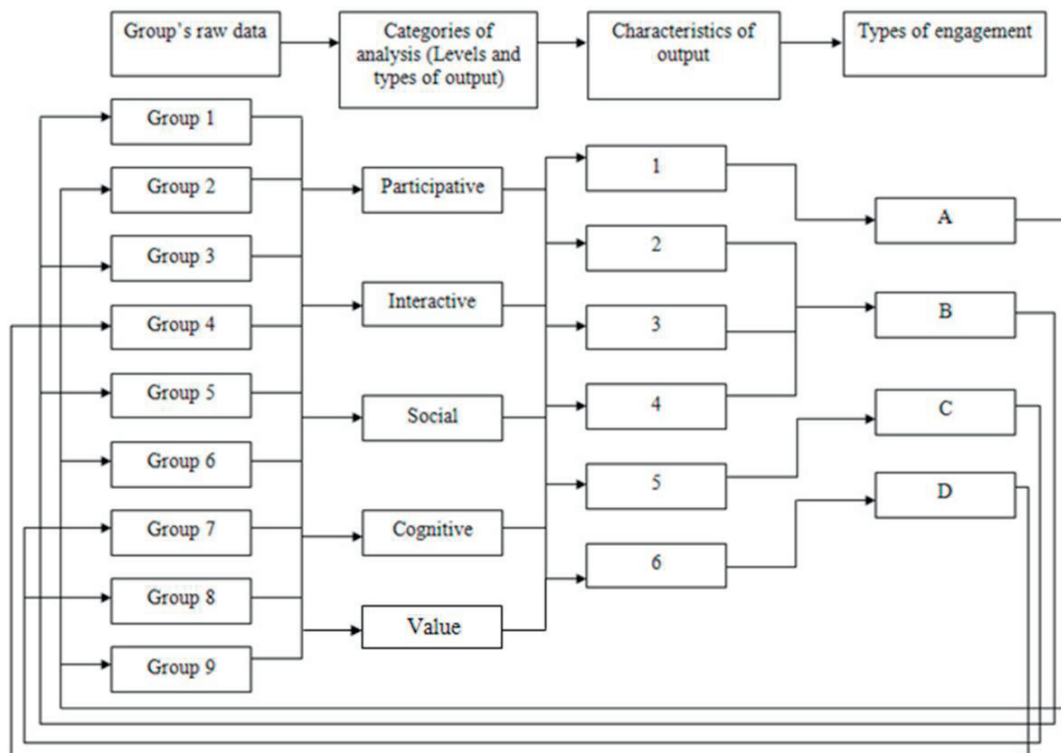

Fig. 1. Overall analytical process of interactions in Facebook

5. Conclusion

This paper has highlighted an approach for analyzing students' online interactions that takes place in Facebook environment. The approach is based on a five-dimensional model that includes a participative, an interactive, a social, a cognitive and a value dimension. Each dimension comprises a set of indicators to be and can be used to analyze students' interaction within Facebook environment. The proposed set of indicators, drawn from the literature and the researcher's field experience from a semester-long tertiary ICT education course with online learning environment participation, are discussed for each dimension. The values dimension is developed by considering students' personal values and culture values beliefs. Although, there are numerous studies on value in face-to-face environment, little or no research has focused values via online, especially through Facebook environment and the exploration on values as one of online learning interaction dimension is still lacking in the

literature [13]. Thus, the value dimension integration is proposed in order to identify students' holistic learning process through Facebook in higher education.

Acknowledgements

References

[1] Chou, C., Peng, H., & Chang, C.-Y. (2010). The technical framework of interactive functions for course-management systems: Students; perceptions, uses, and evaluations. *Computers & Education, 55*(3), 1004-1017.

[2] Debra J. Rickwood (2010): Promoting Youth Mental Health through Computer-Mediated Communication, *International Journal of Mental Health Promotion*, 12:3, 32-44.

[3] Downing, K. J., Lam, T. F., Kwong, T., Downing, W. K., & Chan, S. W. (2007). Creating interaction in online learning: a case study. *Research in Learning Technology, 15*(3), 201-215.

[4] Duffy, P. (2011). Facebook or Faceblok: Cautionary tales exploring the rise of social networking within tertiary eduction. In M. J. W. Lee & C. McLoughlin (Eds). *Web 2.0-base e-learning: Appling social informatics for tertiary teaching* (pp. 284-300). Hershey, PA:IGI Global.

[5] Ellison, N. B., Steinfield, C. and Lampe, C. (2007), The Benefits of Facebook "Friends:" Social Capital and College Students' Use of Online Social Network Sites. Journal of Computer-Mediated Communication, 12: 1143–1168. doi: 10.1111/j.1083-6101.2007.00367.

[6] Harasim, L. (2012). *Learning Theory and Online Technologies* (First ed.). New York: Taylor and Francis Group.

[7] Harasim, L. (2004). Collaboration. In K. R. A. DeStefano, and R. Silverman (Ed.), *Encyclopedia of Distributed Learning* (pp. 65-68). Thousand Oaks, CA: SAGE Publications.

[8] Harasim, L. (2007). Assessing Online Collaborative Learning: A Theory, Methodology, and Toolset. In *Flexible Learning in an Information Society* (pp. 282-293): IGI Global.

[9] Henri, F. (1992). Computer conferencing and content analysis. In Kaye, A. R. (Ed.), *Collaborative leaning through computer conferencing*, New York: Springer, 115–136.

[10] Hillman, D. C. A., Willis, D. J., & Gunawardena, C. N. (1994). Learner-Interface Interaction in Distance Education: An Extension of Contemporary Models and Strategies for Practitioners. *The American Journal of Distance Education, 8*(2), 30-42.

[11] Internetworldstats. (2012). Internet World Stats. from http://www.internetworldstats.com/

[12] Kirkwood, A. (2009). E-learning: you don't always get what you hope for. *Technology, Pedagogy and Education, 18*(2), 107-121.

[13] Krasnova, H, Wenninger, H., Widjaja, T. & Buxmann, P. (2013). Envy on Facebook: A Hidden Threat to Users' Life Satisfaction? *11th International Conference on Wirtschaftsinformatik*, Leipzig, Germany.

[14] Manca, S. and Ranieri, M. (2013), Is it a tool suitable for learning? A critical review of the literature on Facebook as a technology-enhanced learning environment. Journal of Computer Assisted Learning. doi: 10.1111/jcal.12007

[15] Mason, & Rennie, F. (2008). *E-learning and social networking Handbook: Resources for higher education*. New York, USA: Routledge.

[16] Miltiadou, M., & Savenye, W. C. (2003). Applying Social Cognitive Constructs of Motivation to Enhance Student Success in Online Distance Education. *Educational Technology Review, 11*(1).

[17] Moallem, M. (2003). An interactive online course: A collaborative design model. *Etr&D-Educational Technology Research and Development, 51*(4), 85-103.

[18] Mohamad Said, M. N. H., Forret, M. & Eames, C. (2011). The Nature and Characteristics of Online Group Learning in Malaysian Tertiary Classroom. *1ˢt Malaysian Research Conference*, 17 December 2011, Auckland New Zealand.

[19] Mohamad Said, M. N. H. (2011). The Design and Implementation of an Online Collaborative Learning in Malaysian Tertiary Classroom. *Proceedings of International Conference on Education and New Learning Technologies*. Barcelona, Spain, 5487-5492. ISBN 978-84-615-0441-1

[20] Mohamad Said, M. N. H., Forret, M. & Eames, C. (2011). Enhancing Students' Learning through the Implementation of E-Collaborative Learning in Malaysian Tertiary Classroom. *CSTER Graduate Conference 2011.* 13 October 2011, University of Waikato, New Zealand.

[21] Mohamad Said, M. N. H., Forret, M. & Eames, C. (2010). An Online Group for Collaborative Learning in Malaysian Pre-Service Teachers Programme. *Proceedings of International Conference of Education, Research and Innovation.* Madrid, Spain, 1719-1729. ISBN 978-84-614-2439-9

[22] Mohamad Said, M. N. H., M. & Eames, C. (2010). Malaysian Undergraduate Pre-Service Teachers' Perceptions of Learning Online Through The Implementation of an Online Collaborative Learning Environment. *Proceedings of Globalization and Localization in Computer-Assisted Language Learning.* Kota Kinabalu, Sabah.

[23] Moore, M. G. (1989). Three types of interaction. *The American Journal of Distance Education, 3*(2).

[24] Moore, M. G., & Kearsley, G. (1996). Distance education: A systems view. Boston, MA: Wadsworth Publishing.

[25] Moore, M. G., & Thompson, M. M. (1997). *The Effects of Distance Learning*. PA: The Pennsylvania State University.

[26] Nguyen, L. V. (2011). *Computer-Mediated Collaborative Learning in a Vietnamese Tertiary EFL Context: Process, Product, and Learners' Perceptions.* Unpublished doctoral dissertation thesis, Massey University, Palmerston North, New Zealand.

[27] Palloff, M. R., & Pratt, K. (2005). *Collaborating online: Learning together in community*. San Francisco: Jossey-Bass.

[28] Pozzi, F., Manca, S., Persico, D., & Sarti, L. (2007). A general framework for tracking and analysing learning processes in computer-supported collaborative learning environments. Innovations in Education and Teaching *International*, 44(2), 169-179.

[29] So, H. J., & Brush, T. A. (2008). Student perceptions of collaborative learning, social presence and satisfaction in a blended learning environment: Relationships and critical factors. *Computers & Education, 51*(1), 318-336.

[30] Social Psychology (2012), International Journal of Psychology, 47:sup1, 698-743

[31] Wever, et al., (2006). Content analysis schemes to analyze transcripts of online asynchronous discussion groups: A review. *Computers & Education*, 46 (2006), 6-28.

[32] Wilson, R. E., Gosling, S. D. & Graham, L. T. (2012). A review of Facebook research in the social sciences. *Perspectives on Psychological Science,* 7 (3), 203-220.