

Charismatic Learning: Students' Satisfaction with E-Learning in Higher Education

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Abstract

Charismatic learning is the power to motivate the students, which is especially important in self-regulated learning. According to findings of critical incident techniques, researchers indicate that Charismatic learning and e-learning provide some good methods to help instructors facilitate students' learning and make collaboration easier. Knowledge enhancement by self-regulation of learning is the preferred characteristic of charisma in the e-learning classroom. Students mentioned some of the benefits such as the flexibility of the learning schedule, having access to on-line materials for review outside of class, and having access to comprehensive supporting material for collaborative learning. Charismatic learning is the perception of trust in the instructor which is related to the availability and enthusiasm of instructors. The results suggest that in the e-learning classroom context, the instructor should work more as facilitators than as the sole source of knowledge.

Keywords: Charismatic learning, Flow theory, Critical incident technique

1 Introduction

Although years of development have been done, so far, the recent trend shows that e-learning is still one of the mainstream teaching methods in the future. Some advantages of the e-learning classroom have been well discussed in the literature. For example, students who are shy about talking in public may feel better about expressing ideas in an e-learning classroom [5, 28]. Wang and Huang [21] argue that student using blogs and RSS system has a positive influence on all students' perceptions of learning effectiveness and learning satisfactions. In contrast to the traditional teaching, the Moodle e-learning into elementary

school's curriculum indeed improves students' learning performance [20]. In a digital classroom, students may also have more opportunities to come up with their own learning strategies [16, 27]. However this does not mean all students will benefit from e-learning classrooms.

Learning performance is determined by the interaction of many factors, such as students' backgrounds, teachers' characteristics, the characteristics of the learning content, pedagogical design, the learning environment, learning achievements and socially shared regulation frequency [6, 19, 26]. Previous studies have tried to draw a picture of a classroom using the dramaturgy theory, where the teacher acts as an actor, students the audience, and the classroom as a theater. Halliday et al. [9] discussed the charisma of the teacher and the role of the students in the creation of an attractive classroom environment. The charismatic teacher's mission is to inspire students to be willing to learn, while, in addition to charismatic leadership, students are willing to cooperate with the teachers. Being able to evaluate and plot their own learning experience is also very important.

Charm can refer to the whole situation and not merely the leader. Based on ten years of teaching experience related to engagement in action and reflection upon andragogy theory, Raflin [15] indicated that successful learning is achievable only through reliance upon the charisma of the teacher. There has been too much focus placed on the teacher's charisma, their skills to excite the students to learn. He insisted that the greatest learning stimulant does not lie in how well prepared the lecture is or how timely the feedback. Instead, it has to do with providing an effective-learning environment that encourages students to reflect, to construct and to accumulate their own learning. Raflin [15] indicated the idea of focused learning. The implication is that a teacher in the higher

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education system is more a facilitator of the knowledge community of inquiry. Teaching is the orchestration of learning, rather than simple transmission of knowledge to the students. Students should be more active in learning how to learn and choose the most suitable path. The peers should also help each other to integrate past knowledge and accumulate new knowledge.

Charisma is rooted in values and feelings and it's influence born of the alchemy that Aristotle [1] called the logos, the ethos, and the pathos. Previous studies have tried to analyze it through trust theory, where followers are inspired by their charismatic leader [9]. The goal is to analyze and understand the teacher's charisma. In contrast, Raflin [15] criticized that focusing only on the teacher's charisma in the learning environment is too restrictive an approach. It does not lead to a well-rounded model for learning, lacking consideration of the student's self-understanding, organizing and strategy of knowledge enhancement.

Raflin's proposal [15] reminds us of what is at the center of learning. Students are cognizant that a course providing self-regulated learning is much more attractive than on with an excellent actor-playing teacher. Killi [14] compared challenge to blood pumped from the heart, bringing motivation for the learning process through cooperation with peers, reflection, searching for information, and so on. Charisma is used as the structural foundation for synthesizing and organizing the elements of e-learning take from the literature to produce a concise model for students' satisfaction.

2 Charisma in E-Learning

2.1 Satisfactory Factors in E-learning

When using an e-learning environment, students' e-learning satisfaction should be considered because e-learning is a more active learning method and has more influencing factors than traditional learning methods. Killi [14] indicated that students' satisfaction with the e-learning environment plays an important role in e-learning or blended learning. Previous studies [7, 11-13, 17] have identified important variables for the satisfaction with e-learning, such as, synthesizing the technology acceptance model and expectation confirmation model. Sun et al. [23] reviewed relevant literatures, grouped influencing factors to obtain six dimensions of students' learning satisfactions, and including thirteen variables. The study used the teaching environment of Taiwan as the research subject and found that seven variables accounted for 66.1% of changes in students' learning satisfactions, including students' anxiety about IT, the teacher's attitude to e-learning, the flexibility of the e-learning course, the quality of the e-learning course, perceptions of usefulness, perceptions of ease of use, and variations in assessment. The results show that the most important

of these is the quality of the curriculum, which involves both the design of the content and the design of the curriculum on the technical level [23]. Students' expectations of self-regulation to gain knowledge in e-learning lead to better performances, however, they might be unrelated to satisfaction when comparing those who do not have expectations [18]. The instructor's enthusiasm, professionalism, and expressive capability all impacted student satisfaction, but the scenarios in e-learning might be different from those in traditional courses [7, 23].

Teaching and learning are complex and the form of teaching is not the only influential factor. Nortvig et al. [24] indicated that the educators' presence in online settings, interactions between students, teachers and content, and designed connections between online and offline activities have impacts on learning outcomes and learning satisfactions. Satisfactions might also come from the benefit and creation of learning strategies, schedules, assessment and collaborative-learning by using the e-learning technology provided, and the the perceived responsiveness also is a important influential factor of satisfaction [22].

The interactive effects of learning elements seem to be neglected in previous studies. However, as mentioned by Swan [18], the influential variables in learning are interactive, not independent. The researcher guesses that the reason the interactions have been ignored is because they are so complicated. Figure 1 shows how complicated the variable interactions will be when developing the questionnaire.

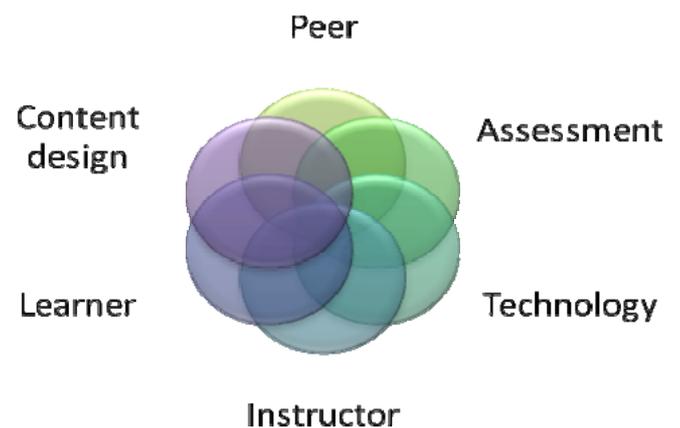


Figure 1. Interactions of the e-learning satisfaction elements

2.2 Charisma in Learning

Halliday et al. [9] defined charisma to be a deep ideological value shared between the leader and followers. Charisma is widely visible in religion, social science, and media (arts, speech, and entertainment). Antonakis, Fenley, and Liechti [1] used the "I have a dream" speech by Martin Luther King as an example to illustrate charisma. A charismatic speaker will use metaphors, stories, anecdotes, voice, expressions, and

gestures to help the audience to understand, relate to, and remember the message, the strength, and the passion that he/she wants to convey to the audience [1].

There has not been much previous studies on charisma in learning, but most often applied in leadership. Charismatic leadership is a transformational leadership behavior, contrary to transactional leadership. A charismatic leader may be a manager, a teacher or a public person in the media, and has the capability to give inspiration and vision to their followers [10]. A charismatic leader can persuade, influence and motivate others by their words [2]. Transformation or change will happen if the follower can trust and identify with his/her leader. This is why charismatic leadership is also known as transformation leadership. They have actual authority and are also good at using their authority to tell those followers what to do. In the learning setting, students have to believe that what the instructor teaches is useful. This is different from transaction leadership which is based on costs and benefits, such as where students gain good grades by doing the homework well.

The roles of leaders and followers are interchangeable in the higher education environment [9]. Students sometimes play the roles of leaders in the group and assist teachers in teaching. Charismatic leaders may also appear in frequently interacting students (friends) and have similar values or perceptions of their leaders [20].

To understand how charisma was produced usually by context-based, analyzing based on the scene, the symbols, and the metaphors of interaction (such as speech, movement, and facial expression) between the leader and the follower. Halliday et al. [9] described a classroom in higher education as like a lecture theater, with many interactions happening between the instructor and the students, and between the students and their classmates. The task of a charismatic instructor is to provide sufficient challenge, inspiration, motivation, stimulation, confidence, understanding to motivate students to learn [9]. Lin and Huang [25] found students believed that the charisma of teachers contributed significantly to the learning of predictive equations because they were perceived interest. So charismatic learning comes from a scenario of interactions between different elements and can not merely be limited to the leader. Raflin [15], based on ten years of teaching experience, engaging in learning action and reflection of the theory of andragogy in relation to adult education against focuses on the charisma of teaching by terms of excitement. Instead of a well- prepared lecture or giving immediate feedback, Raflin [15] argued that charismatic learning means that an instructor should provide an effective environment for students to accumulate knowledge. Based on this premise, the teacher is the facilitator to a community of inquiry, teaching becomes an orchestration of learning, not handing out knowledge as if feeding students food.

Students are better off having more autonomy to learn how to learn and to choose the most appropriate way to learn. Peers are better off being able to help each other integrate past knowledge, to accumulate and form new knowledge. Charm in a classroom is not just the responsibility of the teacher, but instead lets the center of e-learning go back to learning itself [15].

3 Methodology

3.1 Conceptual Framework

The goal of this study is to discover what interactions among all satisfaction factors in e-learning will create a charismatic learning environment. Detailed graphics are shown in Figure 2. One of the scenarios is the interaction of some satisfactory elements in e-learning: the perceived importance of the learning objective, useful content, good activity design, collaborative-learning, instructors as facilitators, and effectiveness of technology used.

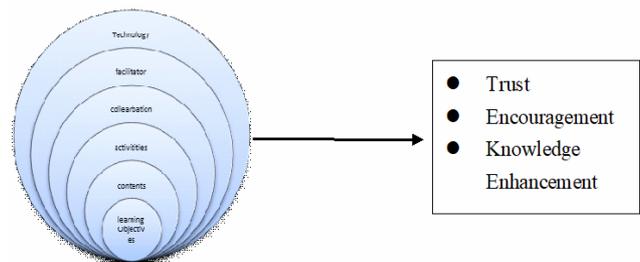


Figure 2. Conceptual framework

There are three kinds of charisma; trust, encouragement and knowledge enhancement may be perceived in this scenario.

3.2 Critical Incident Technique

Rather than exclusively applying a grade-based metric, this study takes a scenario-based analysis approach, the Critical Incident Technique (CIT), to evaluate students' impressions. Grade assignment in different classrooms is often based on a myriad of factors, including differences in course contents, in the assessment metric, and on student backgrounds, which could also be potentially affected by differences in learning platforms. This study systematically analyzes the interactive effects for creating satisfactory experiences in six different e-learning classes.

Originally developed by Flanagan [4] as a form of content analysis, the set of CIT procedures aim to gather specific observations and important behavioral facts grown in popularity with service-related research over the last three decades. In broad perspective, due to its usefulness in solving practical problems and developing broad psychological principles regarding service encounters [8], CIT is also used to collect information on the satisfaction of learning experiences

which validates possible good interactions in different learning contexts.

3.3 Procedures

CIT is designed to collect data which is useful for answering research questions, while sacrificing the least amount of detail and depth as possible [3]. CIT accomplishes this goal through a two-stage process—collection and classification. The first step, collection of behavioral observations, involves accumulation of self-reports from study participants. In the second stage, these collected events, phenomena or occurrences are classified so that they become useful for addressing practical problems [4].

Classified respondent data are referred to as “incidents.” Incidents in the present study are comprised of interactions of learning elements in Figure 2: learning objectives, content, activities, facilitator, collaboration, and technology.

There are many classes in the learning presence that need to be classified to correspond to theory. The four-stage CIT procedures used in the study can be summarized as follows: (1) collect learning incident reports regarding satisfaction in the target classroom; (2) categorize incidents into categories; (3) develop categories based on the learning charisma framework; (4) examine the distribution of categories to determine how incidents of satisfaction vary in different classrooms and with different pedagogical designs.

3.4 Questions in CIT

This study probed for critical incidents by asking respondents to recollect especially satisfying learning experiences related to the target class they had participated in, including the time of the incident and what had happened, what the instructor had said or done, and what the outcome was. Most participants reported one incident per interview, but in some cases, there are two or three incidents, producing a total of 578 valid incidents from a sample of 320 students, surpassing the 433 incident average obtained in previous CIT studies [8] and meeting the CIT analysis standard of 50 to 100 incidents for unambiguous activities [4].

3.5 Target Courses

Eight target courses were blended including e-learning classes and face-to-face classes. Four were basic science classes: Principles of Accounting, Research Methodology, Introduction to Computers, and Management Information Systems; three were more liberal classes: Information Technology and Literacy, Introduction to Software, Objective-Oriented Programming Language. Some of the courses are more important and difficult because they were required courses, such as Principles of Accounting, Objective-Oriented Programming Language, and Research

Methodology. In general, students are willing to spend more time on required courses than elective courses.

4 Results and Discussions

We analyzed the critical incidents based on the factors of charismatic learning: trust, encouragement and knowledge enhancement. It was found that the incidents in the e-learning classrooms differed from those in the face-to-face classrooms. Five major categories which are illustrated as follows seemed to satisfactorily subsume the important characteristics of e-learning charisma: facilitation by technology.

4.1 Property of Trust in the Facilitator Using E-learning Technology

In the first incident, the student felt anxiety right after the instructor announced the content of the exam, because they felt the challenge was too hard. However he (or she) felt better after the instructor strove to remedy his (her anxiety), such as whether I can complete all the questions or how difficult the exam will be. And finally, he (or she) obtained a satisfactory grade. The second incident showed how the TA helped the student by using remote control technology. The technology provided extra opportunities for convenient communication between the student and the teacher. The result is shown in Table 1.

4.2 Property of Trust through Collaboration by Using Social Media Technology

Social media can provide a mechanism for initiating cooperation. In this incident the student was satisfied with the collaboration initiated with a team member, the convenience of the technology, and their grade. The result is shown in Table 2.

4.3 Property of Trust in Enthusiasm of the Facilitator in the E-learning Classroom

In the course Principles of Accounting, a normal faced-to-face class was conducted. The instructor also provided video tutorials to help students review. The student perceived the online support materials such as video tutorials to be representative of the enthusiasm of the facilitator. The student appreciated the support from the video. The instructor put the pictures of puppets in the frame of instructor’s photo. The halo effect by the diligence of the instructor might be happened because the student mentioned that behavior also a sign of instructor’s efforts to attract students.

4.4 Encouragement from Activities by Using Technology

Unlike the encouragement received in a face-to-face classroom where most of the praise comes from the instructor, encouragement in the e-learning classroom

Table 1. Incidents of the property of trust in the facilitator

Content property	Example incident	Satisfactory elements
Instructor provided useful ways to solve difficulties within the e-learning platform	The huge number of questions (about seven to eight hundred questions) makes the students aware of the difficulty to prepare for the exam. Instructors used several ways to decrease the level of anxiety of the students. First, all the answers to the questions could be found on the Internet. Secondly, the instructor provided online discussion time to answer students' questions. Thirdly, the instructor clearly announced the schedule for the exam, the number of questions and the scope of the exam (guaranteed to be from the database) (MIS). I could get the necessary information and submit homework conveniently by using the e-learning platform (Introduction to Computers). Once I had a problem following the operation of the line demo example. I filed my problem to the discussion room. The teaching assistance helped me by remotely controlling my computer and solving my bug (Introduction to Software).	1. Content provided a challenge 2. Facilitation by the instructor 3. Illustration of objective of exam 4. Useful technology

Table 2. Incidents of the property of trust through collaboration

Content property	Example incident	Satisfactory elements
Social media enhanced the collaboration	The final report needed the cooperation of all team members. We developed a community on Facebook. All team members responded to each other and participated in discussions aggressively. Each one was concerned about the quality of the report, and no one ignored his/her contribution or did not participate. (Information Literacy).	1. Content provided a challenge 2. Useful technology

comes from the usefulness of the technology. The technology provides more flexibility in setting strategies and efficiency in self-regulated learning, such as selecting learning schedules and processes to meet individual needs. Transforming digital information or data is more convenient than by hardcopy. The result is shown in Table 3.

4.5 Knowledge Enhancement by the Facilitator Using Technology

Charisma of knowledge enhancement may be an

advantage in e-learning. Reflection from students can happen while controlling the learning process. In face-to-face classrooms, instructors can more easily become the protagonist. Instead, learning becomes the center of the learning activities and the instructor becomes the facilitator. The first incident in Table 4 shows how well the instructor designed the discussion activities and provided sufficient material. Modern technology and multi-media material enhanced the interest and communication capability for e-learning.

Table 3. Incidents of the property of encouragement from activities

Content property	Example incident	Satisfactory elements
Flexibility of technology	The information on the e-learning platform is very clear and delivered on time in relation to the issue and topic before the class (MIS). Students perceived that the e-learning platform was practical and convenient in on-line discussions. The instructor did not need to give out hardcopy, all materials could be download through the platform (MIS). In the week of the mid-term exams, I could ignore the e-learning class, and focus on other courses and then find the remedy after that week (Information Literacy). At nine o'clock, I get up in an empty dorm, eat breakfast and browse the materials in the e-learning platform. I felt the pleasure of learning (Information Literacy).	1. Useful technology 2. Proper content design

Table 4. Incidents of knowledge enhancement by the facilitator

Content property	Example incident	Satisfactory elements
Form effective discussion themes to decompose and construct knowledge	In addition to the text, participants could also discuss in the chatroom by voice. The instructor designed questions to help students easily respond for support materials provided by the instructor were useful and most of the time there were figures which were perceived easier to be more comprehensible than the text (MIS). The instructor would stay in the chartroom before a quiz. All discussions would be recorded by voice and by text. Students would gain knowledge by asking their own questions and by the instructor’s responses to the questions of other classmates (Principles of Accounting). Students perceived the online content being useful for review and self-regulated learning in preparation for the exam (Principles of Accounting).	1. Content design 2. Facilitator (professionalism and enthusiasm) 3. Collaboration 4. Useful technology

For example, through information shown in the forum frame (marked “Forum” in Figure 3), the instructor could know who and how many participants are in the forum and gave instant feedback to any specific student via “VoIP” functions. Students could browse the PPT materials (marked “PPT” in Figure 3) using the TeamViewer e-learning software. All participants (instructor and students) could talk to each other using the “Talk” function.

student’s perspective to provide insight into the charisma of learning. We considered a different vision from quality and satisfaction with learning that seemed to offer a more precise description of the attraction and objectives of higher education. Charismatic learning is defined as facilitating students being able to construct their own symphony of knowledge.

As the charisma of a course is an integrated effect formed by the interaction of numerous learning elements, a scenario-based analysis approach (namely the Critical Incident Technique) was used to evaluate students’ impressions. Seven interactive charismatic learning elements were identified from the literature: the perceived importance of the learning objective, useful content, good activity design, collaborative learning, instructor as a facilitator, and effectiveness of technology used. Three kinds of charisma: trust, encouragement and knowledge enhancement were used to classify the satisfactory incidents.

Summarizing the satisfactory incidents in the e-learning classrooms, it can be concluded that charismatic learning in relation to trust and knowledge enhancement could be improved by adding e-learning to face-to-face classrooms. The element of trust came arose from the availability of the instructor when the students had problems doing homework or preparing for exams. Collaboration also happened when students observed the questions being asked by their classmates. Confidence was aroused when instructor or classmates were able to help them to overcome difficulties. Even if no one mentioned that the charisma of the instructor they admired, students did appreciate the help received from the instructor and teaching assistant.

Knowledge enhancement by self-regulated learning may be the most charismatic type of learning in e-learning classrooms. In an easy course, such as Information Literacy, students mentioned the flexibility of the class time (no need to get up early or being able to postpone study in the mid-term week) as being satisfactory. In a difficult course, such as Principles of Accounting or Objective-Oriented

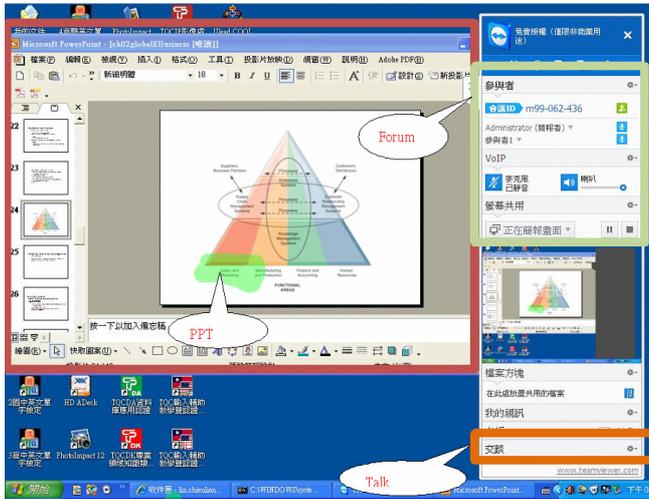


Figure 3. Example of Android version of the forum for TeamViewer

Students usually had questions or problems when they have done their homework or prepared for a quiz, not immediately after the lecture. The second incident in Table 4 indicates the right time for the instructor to facilitate the learning, not just by him, but also by enabling collaboration among the students. The third incident showed that the instructor designed good material for students to prepare for the exam.

5 Conclusions

In this paper, we explore e-learning courses from the

Programming Language, instructors provided useful on-line materials for students' review after class or comprehensive support material for collaborative learning (discussion). Instructors worked as facilitators in the e-learning classroom.

Implications from our findings are discussed below. We hypothesize that charismatic learning in the e-learning classroom should be: (1) a task with a clear objective, and integrated with (2) useful content which has been decomposed and designed to be easily understandable. Multi-media content, selected to combine voice and figures with text, is better than text only. The students appreciated and considered the instructor to be enthusiastic if he/she prepared useful multi-mediated contents. (3) The role of instructor as facilitator is apparent. (4) Collaboration can be either initiated by the instructor or by the students themselves. (5) Activities more appropriate in the e-learning classroom are collaboration and self-regulated learning because the (6) technology of e-learning does provide more opportunities for collaboration and communication among instructor and students and among classmates as well as flexibility in setting individual strategy for learning.

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References

- [1] J. Antonakis, M. Fenley, S. Liechti, Learning Charisma: Transform Yourself into the Person Others Want to Follow, *Harvard Business Review*, Vol. 90, No. 6, pp. 127-130, June, 2012.
- [2] B. M. Bass, *Leadership and Performance Beyond Expectations*, Free Press, 1985.
- [3] M. J. Bitner, B. H. Booms, M. S. Tetreault, The Service Encounter: Diagnosing Favorable and Unfavorable Incidents, *Journal of Marketing*, Vol. 54, No. 1, pp. 71-84, June, 1990.
- [4] J. C. Flanagan, The Critical Incident Technique, *Psychological Bulletin*, Vol. 51, No. 4, pp. 327-358, July, 1954.
- [5] D. Francescato, R. Porcelli, M. Mebane, M. Cuddetta, J. Klobas, P. Renzi, Evaluation of Efficacy of Collaboration Learning in Face-to-Face and Computer-supported University Contexts, *Computer in Human Behavior*, Vol. 22, pp. 163-176, March, 2006.
- [6] S. D. Freitas, M. Olive, How Can Exploratory Learning with Games and Simulations within the Curriculum be Most Effectively Evaluated?, *Computer & Education*, Vol. 46, pp. 249-264, April, 2006.
- [7] F. Fu, Comparison of Students' Satisfaction and Dissatisfaction Factors in Different Classroom Types in Higher Education, *Lecture Notes in Computer Science*, Vol. 6248, pp. 415-426, October, 2010.
- [8] D. D. Gremler, The Critical Incident Technique in Service Research, *Journal of Service Research*, Vol. 7, No. 1, pp. 65-89, August, 2004.
- [9] S. V. Halliday, B. J. Davis, P. Ward, M. Lim, A Dramaturgical Analysis of the Service Encounter in Higher Education, *Journal of Marketing Management*, Vol. 24, No. 1, pp. 47-68, February, 2008.
- [10] J. M. Howell, B. Shamir, The Role of Followers in the Charismatic Leadership Process: Relationships and their Consequences, *Academy of Management Review*, Vol. 30, No. 1, pp. 96-112, January, 2005.
- [11] S.-S. Liaw, H.-M. Huang, Perceived Satisfaction, Perceived Usefulness and Interactive Learning Environments as Predictors to Self-regulation in E-learning Environments, *Computers & Education*, Vol. 60, No. 1, pp. 14-24, January, 2013.
- [12] F. Ke, D. Kwak, Online Learning Across Ethnicity and Age: A Study on Learning Interaction Participation, Perception, and Learning Satisfaction, *Computers & Education*, Vol. 61, pp. 43-51, February, 2013.
- [13] Y. C. Kuo, A. E. Walker, K. E. E. Schroder, B. R. Belland, Interaction, Internet Self-efficacy, and Self-regulated Learning as Predictors of Student Satisfaction in Online Education Courses, *The Internet and Higher Education*, Vol. 20, pp. 35-50, January, 2014.
- [14] K. Killi, Digital Game-based Learning: Towards an Experiential Gaming Model, *Internet and Higher Education*, Vol. 8, pp. 13-24, March, 2005.
- [15] A. R. Raflin, Taking the Charisma Out: Teaching as Facilitation, *Organization Management Journal*, Vol. 3, No. 1, pp. 4-12, May, 2006.
- [16] K. E. Scriber, C. Gray, Encouraging Students to Develop Their Own Learning Strategies, *Athletic Training and Sports Health Care*, Vol. 5, No. 2, pp. 57-58, February, 2013.
- [17] H. J. So, T. Brush, Student Perceptions of Collaborative Learning, Social Presence and Satisfaction in a Blended Learning Environment: Relationships and Critical Factors, *Computers & Education*, Vol. 51, No. 1, pp. 318-336, August, 2008.
- [18] K. Swan, Learning Online: Current Research on Issues of Interface, Teaching Presence and learner characteristics, in: J. Bourne, J. C. Moore (Eds.), *Elements of Quality Online Education, Into the Mainstream*, Sloan Center for Online Education, 2004, pp. 63-79.
- [19] L. Zheng, X. Li, R. Huang, The Effect of Socially Shared Regulation Approach on Learning Performance in Computer-Supported Collaborative Learning, *Educational Technology & Society*, Vol. 20, No. 4, pp. 35-46, October, 2017.
- [20] P. C. Chen, T.-S. Lan, S.-C. Chiu, Y.-H. Lan, A Study of Investigating the Learning Effectiveness of Applying the MOODLE E-Learning in Taiwan's Elementary School, *Journal of Internet Technology*, Vol. 15, No. 7 pp. 1191-1194, December, 2014.

[21] C.-S. Wang, Y.-M. Huang, Using Blogs and RSS to Develop a Self-Regulated Learning System for Facilitating Students' Self-Learning, *Journal of Internet Technology*, Vol. 13, No. 6, pp. 1005-1013, November, 2012.

[22] L. Liu, L. Zhang, P. Ye, Q. Liu, Influence Factors of Satisfaction with Mobile Learning APP: An Empirical Analysis of China, *International Journal of Emerging Technologies in Learning*, Vol. 13, No. 3, pp. 87-99, March, 2018.

[23] P. Sun, R. J. Tsai, G. Finger, Y. Chen, D. Yeh, What Drives a Successful E-learning? An Empirical Investigation of the Critical Factors Influencing Learner Satisfaction, *Computers & Education*, Vol. 50, No. 4, pp. 1103-1586, May, 2008.

[24] A. M. Nortvig, A. K. Petersen, S. H. Balle, A Literature Review of the Factors Influencing E-learning and Blended Learning in Relation to Learning Outcome, Student Satisfaction and Engagement, *The Electronic Journal of e-Learning*, Vol. 16, No. 1, pp. 46-55, February, 2018.

[25] S. H. Lin, Y. C. Huang, Examining Charisma in Relation to Student Interest in Learning Outcomes, *Learning in Higher Education*, Vol. 17, No. 2, pp. 139-151, April, 2016.

[26] C. H. Chou, Y. S. Su, A Block Recognition System Constructed by Using a Novel Projection Algorithm and Convolution Neural Networks, *IEEE Access*, Vol. 5, 23891-23900, October, 2017.

[27] Y. S. Su, T. J. Ding, C. F. Lai, Analysis of Students Engagement and Learning Performance in a Social Community Supported Computer Programming Course, *Eurasia Journal of Mathematics, Science and Technology Education*, Vol. 13, 6189-6201, September, 2017.

[28] H.-H. Liu, Y.-S. Su, Effects of Using Task-Driven Classroom Teaching on Students' Learning Attitudes and Learning Effectiveness in an Information Technology Course, *Sustainability*, Vol. 10, 3957, October, 2018.



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