Construction Mediation Training: A Case of Pedagogical Principle-based E-learning

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Abstract Title

Mediation is becoming popular as a means to settle dispute in Hong Kong. There is a cogent need for mediation training to support its wider use. This paper reports the use of network technology to deliver training is the latest trend in the training and development industry and has been heralded as the 'e-learning revolution'. Many institutions are resorting to e-Learning as an important tool in teaching and learning. One of the most crucial prerequisites for successful implementation of e-Learning is the need for careful consideration of the underlying pedagogy, or how learning takes place. In practice, however, this is often the most neglected aspect in any effort to implement e-Learning. The purpose of this paper is first to identify the pedagogical principles underlying the teaching and learning activities that constitute effective e-Learning. Application of the principles and ideas is by way of an online user-interface mediation training system. The primary aim of the online mediation training course is to explore the logrolling methods and strategies for achieving "win-win" settlement in mediation. On completion of the course, students shall be able to demonstrate that i) they have acquired knowledge on the key concepts of logrolling in mediation, namely reality test and preference identification; ii) they have the ability of putting the theories they learnt into practice, i.e. generating an optimal bargaining range and reach a "win-win" agreement; iii) they have acquired knowledge on the evaluation of their e-learning performance. The online learning program provides 3 teaching and learning activities (reality test, preference identification and logrolling) together with 3 learning progress reports to achieve the intended learning outcomes. Finally the logrolling-difference degree (L-DD) is used to evaluate students' learning performance by comparing their logrolling outcomes with the system's logrolling suggestions. The learning assessment report also includes the peers' L-DD results for the reflection by the participating student.

Keywords: Mediation, bargaining range, reality test, preference identification and Logrolling

1. Introduction

During the past two decades, serious disputes have become increasingly common on construction projects in Hong Kong. Mediation has gained wide acceptance as an effective

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informal means of resolution. It has become an integral part of the dispute settlement provisions in most of the standard forms of construction contract in Hong Kong (Cheung, 2010). In addition to this contractual use, voluntary mediation has been introduced in the civil procedures of the High Court as part of the Civil Justice Reform that came into force on 2nd April 2009. Under Practice Direction 6.1, adverse cost order is used to discourage 'refusal to mediate' and 'failing to attempt to mediate'. The Hong Kong Department of Justice in 2010 published a draft report giving recommendations on how to promote and develop mediation services in Hong Kong. One of the key recommendations is to provide mediation training widely in order to arouse public awareness. There is a cogent need for mediation training to support its wider use.

In recent years, the knowledge-based economy has exhibited a pervasive and ever-increasing demand for innovative ways of delivering education, which has led to dramatic changes in learning technology and organizations. As the new economy requires more and more people to learn new knowledge and skills in a timely and effective manner, the advancement of computer and networking technologies are providing a diverse means to support learning in a more personalized, flexible, portable, and on-demand manner (Zhang et al. 2004). With the advance in information technology, the use of network technology to deliver training is the latest trend in the training and development industry and has been heralded as the 'e-learning revolution'. One of the most crucial prerequisites for successful implementation of e-Learning is the need for careful consideration of the underlying pedagogy, or how learning takes place (Govindasamy, 2002). In practice, however, this is often the most neglected aspect in any effort to implement e-Learning (Bixler & Spotts, 2000). Most e-learning providers perceive themselves as mere providers of technology. For example they can only provide tools for e-Learning, but cannot tell educators how to use these tools to teach (Govindasamy, 2002). E-Learning cannot continue to exist without incorporation and consideration of pedagogical principles. This paper firstly identifies the pedagogical principles underlying the teaching and learning activities that constitute effective e-Learning. These principles are then applied and illustrated by an online user-interface mediation training system.

2. Guidelines for development of e-learning programs

Guidelines have been developed to help assure the quality of e-learning programs and courses (Hirumi, 2009). Notable examples include: (1) The Council of Regional Accrediting Commissions (2000), statement of the regional accrediting commissions on the evaluation of electronically offered degree and certificate programs. The Best Practices generated by C-RAC (2000) seek to address concern that regional accreditation standards. Based on the Principles of Good Practice, initially drafted by the Western Cooperative for Educational Telecommunications (WCET, 1997), the Best Practices are meant to assist institutions in planning electronic e-learning activities and provide a framework for self-assessment. (2) The Institute for Higher Education Policy (2000), Quality on the line: Benchmarks for success in Internet-based distance education. The National Education Association (NEA) and Blackboard Inc. jointly commissioned The Institute for Higher Education Policy (IHEP) to examine existing guidelines for distributed learning. An initial list of 45 benchmarks was then analyzed by faculty, administrators, and students from six colleges and universities. The final

outcome of 24 benchmarks for success in Internet-based distance education was published by IHEP in 2000. Subsequently, 16 higher education leaders reviewed the IHEP benchmarks for a symposia sponsored by The Pew Learning and Technology Program, providing further insights into e-learning and quality assurance from a provider and consumer perspective (Hirumi, 2009). (3) The American Council on Education (ACE, 1997), Guiding Principles for Distance Learning in Learning Society. A national task force created by the American Council on Education and The Alliance: An Association for Alternative Programs for Adults generated The Guiding Principles for Distance Learning in a Learning Society (ACE, 1997) that focused on the changing nature of education and training, not on specific delivery systems or methods. The purpose of the guidelines is to "help learners, educators, trainers, technologists, and accreditors/state regulators to develop, deliver, and assess formal learning opportunities" (Sullivan & Rocco, 1997). (4) The American Federation of Teachers (2000), Distance Education: Guidelines for Good Practice. The Guidelines for Good Practice, published by the American Federation of Teachers (2000), is based on a 1999 survey of 200 members. The guidelines are to be applicable to all types of distance education, including job and skill training "because they are simply about good teaching" (AFT, 2000, p. 6). The guidelines are designed to help faculty negotiate distance education issues with management, as well as to help administrators and public officers who want to put quality at the centre of their initiatives. (5) Open and Distance Learning Quality Council (ODLQC, 2001), Standards in open and distance education. Set up by the British government in 1968, the Open and Distance Learning Quality Council (ODL QC) operates as a voluntary distance learning registration system. Course providers must meet the Standards in Open and Distance Education published by ODLQC (2001) to register courses.

E-learning courses and guidelines do not include underlying pedagogical principles. E-learning program and courses focus on the interoperability and reusability of learning objects. The published guidelines do address important instructional variables, such as objectives, content, assessment, feedback, and media use. However, the pedagogical and instructional design principles are seldom deliberated. For example, the following design principles are not addressed by published guidelines. (1) The alignment of objectives and assessments: Alignment between explicit objectives and criteria is fundamental to high-quality instruction (Berge, 2002; Welsh, et al., 2003). High-quality learning environments present learners with explicit and congruent learning objectives and assessment criteria. (2) The alignment of objectives and instructional events: Research suggests that how to teach should be based on the contents to be delivered. The methods to be used to teach verbal information should be different from the methods to be used to teach a procedure that, in turn, should differ from the methods to teach complex problem solving, and so forth (Hirumi, 2009). (3) The nature of feedback: Feedback is vital to e-learning (Yacci, 2000). Feedback may also (a) increase response rates or accuracy, (b) reinforce correct responses to prior stimuli, and (c) change erroneous responses (Jonassen, 1995; Rosenberg, 2001). (4) The design and sequencing of e-learning interactions: In traditional classroom settings, key interactions that affect learner attitudes and performance often occur spontaneously (Zhang, et al., 2004). During e-learning, opportunities to interact in "real-time" are relatively confined (Alexander, 2001; Mason, 2001). (5) Motivational design: Educators recognize that motivation is essential to student learning. Students must be presented with the appropriate

skills and knowledge and they must be motivated to learn and use them (Hirumi, 2009; Reisetter and Boris, 2009).

3. Pedagogical Principles for E-learning

Pedagogical principles are theories that govern the good education practice. The "Seven Principles for Good Practice in Undergraduate Education" were first published in 1987 by the American Association for Higher Education. The "Seven Principles" form a sound model for quality collegiate instruction. While these principles have formed a foundation for traditional classroom instruction, it is important to consider them when developing and designing instruction in technology-based environments (Sorensen and Baylen 2009). The "Seven Principles" can also be adapted to many learning environments (Chickering and Gamson 1987). They support the notion that good teaching is good teaching. They describe some essential components that are important in effective learning environments. The "Seven Principles of Good Practice" (Winona State University, 2003) includes (1) encourage student-faculty contact; (2) encourage cooperation among students; (3) encourage active learning; (4) give prompt feedback; (5) emphasize time on task; (6) communicate high expectations, and (7) respect diverse talents and ways of learning. Based on Jonassen (1995), Ruokamo and Pohjolainen (1998) summarised "Seven Qualities of Learning". (1) Active - Learners' role in learning process is active; they are engaged in mindful processing of information and they are responsible for the result. (2) Constructive - Learners construct new knowledge on the basis of their previous knowledge. (3) Collaborative - Learners work together in building new knowledge in co-operation with each other and exploiting each other's skills. (4) Intentional - Learners try actively and willingly to achieve a cognitive objective. (5) Contextual - Learning tasks are situated in a meaningful real world tasks or they are introduced through case-based or problem-based real life examples. (6) Transfer - Learners are able to transfer learning from the situations and contexts, where learning has taken place and use their knowledge in other situations. (7) Reflective - Learners articulate what they have learned and reflect on the processes and decisions entailed by the process. All these qualities are interactive, interrelated, and interdependent with each other. Govindasamy (2002) further proposed 5 pedagogical attributes for successful e-learning as developing content, storing and managing content, packaging content, student support, and assessment. The pedagogical principle-based e-learning attributes are summarised in Table 1.

4. Pedagogical Principle-based E-learning Exploration: Case of Construction Mediation Training

Student-cantered approach is a major feature of the change in universities, which sets an orientation to the responsibility of teaching. There has been a concern with anchoring performance in student learning outcomes, teaching according to how students learn as well as evaluating how well students learn (Biggs and Tang, 2011). Outcome-based Teaching and Learning (OBTL) is a student-centred approach for the delivery of educational programs. OBTL includes three items: Course Intended Learning Outcomes (CILOs), Teaching and Learning Activities (TLAs) and Assessment Tasks (ATs). The curriculum topics in a program

and courses are expressed clearly as the intended learning outcomes. Teaching and learning activities are then designed to directly facilitate students to achieve those outcomes.

Table 1: Pedagogical Principle-based E-learning Attributes

Phrase	Reference	Learning Activates	Pedagogical E-learning Attributes Deliverable
Design	Berge (2002)	Determine learning objectives	Intended Learning Outcomes (ILOs)
Teaching and Learning	Jonassen (1995); Ruokamo and Pohjolainen (1998); Govindasamy (2002); Hirumi (2009);	Instructional events; online organization and design; Instructional design and delivery; Teaching based on the contents to be delivered; instructional methods; Instructional media; E-learning and instructional system design; Differentiate Teaching; Construct new knowledge on the basis of their previous knowledge; Learning tasks are situated in a meaningful real world tasks or introduced through case-based or problem-based real life examples; Innovative teaching with technology	Learning Contents Development (LCD)
	Chickering and Gamson (1987); Jonassen (1995); Yacci (2000) Rosenberg (2001); Winona State University (2003)	Students feedback; Response; Encourage student-faculty contact; Engaged in active learning process;	Learning Progress Report (LPR); Learning Interaction and Students Support (LISS)
	Jonassen (1995); Ruokamo and Pohjolainen (1998); Zhang et al. (2004); Alexander (2001); Mason (2001); Govindasamy (2002); Winona State University (2003)	Design and sequencing of learning interaction; Encourage cooperation among students; Student's support	
Assessment	Govindasamy (2002); Welsh et al. (2003);	Assessment is to test whether the learning performances achieve the learning objective or not; Assessment and evaluation of student learning and performance outcomes	Learning Assessment Report (LAR)

Assessment tasks address what students are supposed to learn and achieve as well. As stated earlier, in order for any e-Learning implementation exercise to be successful, it must be rooted in strong pedagogical foundations. The followings illustrate the ideas underpinning in this paper. The online mediation training system is used here as an example. The online mediation training course is designed to assist negotiators and mediators to achieve "win-win" settlement. Reaching "win-win" settlement is the desired outcome of mediation. A "win-win" settlement can be seen as one that encourages parties to uphold their contracts when one party achieve its profits and the other party would still be better off. However, this desired outcome is not always achieved. The course includes 3 processes: reality test,

preference identification and logrolling. Reality Test is used to establish the concession rate of the disputing parties and assist them to get ready for "win-win" settlement. Preference identification assists parties to identify their preferences among the issues, through assigning weightings to the issues. Logrolling is to provide user-friendly strategies for parties to make efficient trade-off that involves (1) when to concede (2) on which issue (3) for which party and (4) how much should be conceded. The following pedagogical attributes will be discussed along five parameters: Intended Learning Outcomes (ILOs), Contents Development (LCD), Learning Progress Report (LPR), Learning Assessment Report (LAR), Learning, Learning Interaction and Student Support (LISS).

4.1 Intended Learning Outcomes (ILOs)

The intended learning outcomes (ILOs) are the core of the whole e-learning materials and all e-learning contents must meet and achieve the ILOs that are established. The primary aim of this experiment is to explore the logrolling methods and strategies for achieving "win-win" settlement in mediation. On completion of this experiment, students shall be able to demonstrate that: a) they have acquired knowledge on the key concepts of logrolling in mediation, namely reality test and preference identification; b) they have the ability of putting the theories they learnt into practice, i.e. making use of the logrolling system to generate an optimal bargaining range and reach a "win-win" agreement; c) they have acquired knowledge on the evaluation of their logrolling performance through the devise of "logrolling-difference degree" (L-DD). The OBTL based learning structure is shown in Figure 1.

Figure 1: Online Mediation Training Course-OBTL Learning Structure

4.2 Learning Contents Development (LCD)

The effective e-learning program is not only a mere instructor, but also is assumed as role of content experts, instructional designers, graphic artists, media player, et al. From functional perspective, the learning contents include introduction for course background, learning structure, learning and teaching activities (TLAs), and Assessment Task (AT), as well as some complementary materials like mediation case which is a hypothetical construction case "ABC property Management Limited vs. Peter & Bothers Gardening & Landscaping Limited" used in the course, and manuals to illustrate how to use the online course system. These functional contents are also shown in Figure 1. To achieve the ILOs, the TLAs in this course include three learning units: Reality Test, Preference Identification and Logrolling. Each learning unit has a corresponding exercise to help students better understand the learning contents and increase the learning performance. A learning progress report will also be delivered when students finished each unit. Assessment task is designed to evaluate the learning outcome; also a learning assessment report will be delivered to students finally. Learning contents development shall take the effective learning route for students in account. Constructivism is an essential theory for the research of technology-based learning environments. Constructivism learning is seen as a building process in which learners have an active role and learning is based on their cognitive functioning. The learners obtain new knowledge by constructing it on the basis of their earlier knowledge. The mediation course is designed a clear learning route for students to follow. The students are proposed to have acquired knowledge on the key concepts of logrolling in mediation--reality test and preference identification, by finishing Exercise 1and Exercise 2. Through Exercise 3A and 3B, the students are proposed to have the ability of making use of the logrolling system to generate an optimal bargaining range and reach a "win-win" agreement. Finally evaluation of their logrolling performance will be conducted through the devise of "logrolling-difference degree" (L-DD).

4.3 Learning Progress Report (LPR)

The real value of e-Learning lies not in its ability to train just anyone, anytime, anywhere, but in our ability to deploy this attribute to train the right people to gain the right skills or knowledge at the right time (Govindasamy, 2002). Thus it is important for e-learning program to track learner activities whether or not the appropriate learner is learning the right information at the right time. In mediation course, shown in Figure 2, the Exercise 3B "Logrolling Strategy Practice" is to assist students to reach win-win agreement. In each of the bargaining round, the students will be provided with a suggestion, through which each party concedes at minimum loss to himself while accordingly maximum benefit to the other party. The students need to confirm whether they accept the suggestion or not. If yes, click "Accept" button. If they click "Reject" button, the system will provide some alternative choices to choose. The figure 3 shows the logrolling progress report as the students logrolling record.
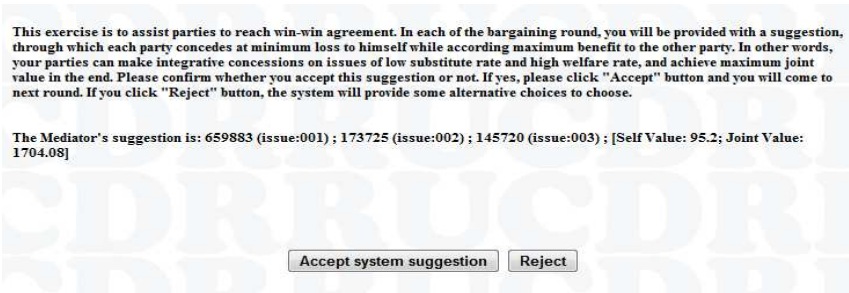
This exercise is to assist parties to reach win-win agreement. In each of the bargaining round, you will be provided with a suggestion, through which each party concedes at minimum loss to himself while according maximum benefit to the other party. In other words, your parties can make integrative concessions on issues of low substitute rate and high welfare rate, and achieve maximum joint value in the end. Please confirm whether you accept this suggestion or not. If yes, please click "Accept" button and you will come to next round. If you click "Reject" button, the system will provide some alternative choices to choose.

The Mediator's suggestion is: 659883 (issue:001) ; 173725 (issue:002) ; 145720 (issue:003) ; [Self Value: 95.2; Joint Value: 1704.08]

| Accept system suggestion | Reject |

Figure 2: Online Mediation Training Course--Exercise 3B: Learning Strategy Practice

Figure 3: Online Mediation Training Course--Exercise 3B: Learning Progress Report

4.4 Learning Assessment Report (LAR)

Assessment is an indispensable part of e-learning program. Essentially, it is assessment that reinforces the learning approach a student adopts. Assessment is typically divided into two types, the summative assessment and the formative assessment. Summative assessment is used to grade students to demonstrate students' achievement and it involves making a final judgment of the students' achievement. Formative assessment is used as a diagnostic tool for students and teachers to identify and improve areas of weakness (Govindasamy, 2002). In mediation course, the logrolling-difference degree (L-DD) is defined to evaluate parties' logrolling performance by comparison of the difference between system's logrolling suggestions and the parties' logrolling outcomes. The smaller the L-DD, the closer are the actual outcomes to the optimal bargaining that each party concedes at minimum loss to himself while according maximum benefit to other parties. Here is an example. The L-DD

between Subjects' actual logrolling outcomes and Mediator's expected logrolling outcomes of group *i* is 5%. The average L-DD of all experiment groups is 5.5%. Thus the group *i*'s logrolling performance is better than the average level. Seen from Figure 4 below, the system's logrolling suggestions are marked in red and parties' logrolling outcomes are marked in blue. M represents to system and H is for party. The parties are proposed to begin with their most preferred position. Client begins with point H1 and Contractor begins with point H16 (seen the arrow direction). Parties are proposed to concede at minimum loss in exchange for maximum benefit to the other party, and get convergence at point M9 which is marked as "▪".
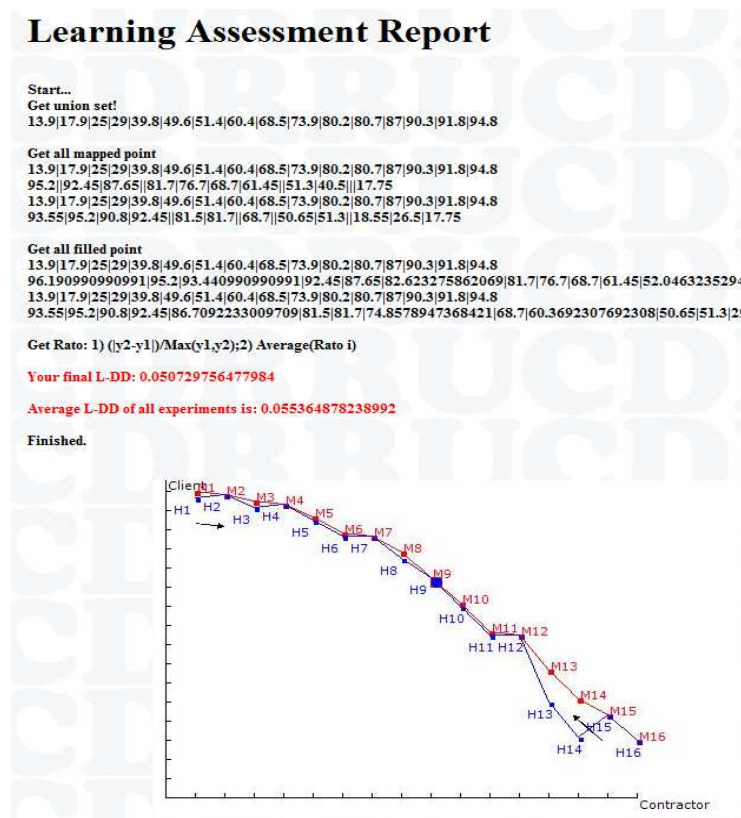

Figure 4: Online Mediation Training Course—Learning Assessment Report

4.5 Learning Interaction and Students Support (LISS)

Learning interaction and student support is one area of e-Learning that is markedly different from the traditional classroom delivery method. In traditional classroom instruction, student support can be addressed on a supply-and-demand basis. In e-Learning settings, where students learn as a result of interaction with programmed instructional systems, all possible types of problems student are likely to face have to be foreseen in advance in order to introduce features for performance support. One way of doing this is by using a framework based on Laurillard's Conversational Theory. This theory advocates a teaching strategy based on interaction between teacher and student; not on the actions required of the student by the teacher (Govindasamy, 2002). Role play is applied in the online mediation course to help students understand the mediation process. In this mediation training course, the

students were randomly assigned to the roles of Mediator, Contractor and Client in Exercise 1 "Reality Test". Contractor is inputting the concession rate first. Mediator and Client receive the Contractor's information. Client then responses a corresponding concession rate, after which Mediator has a record of both parties' concession rate and make a judgment whether the concession rate are within the potential win-win agreement zone. The judgement will deliver to parties as well. If no, the Mediator would suggest adjustments. If yes, parties can continue after confirmation.

5. Conclusion

Disputes are common in construction projects in Hong Kong, and mediation has gained wide acceptance as an effective informal means of dispute resolution. One of the key recommendations is to provide mediation training widely in order to arouse public awareness. With the advance in information technology in the last few decades, the use of network technology to deliver training is the latest trend in the training and development industry and has been heralded as the 'e-learning revolution'. One of the most crucial prerequisites for successful implementation of e-Learning is the need for careful consideration of the underlying pedagogy, or how learning takes place (Govindasamy, 2002). In practice, however, this is often the most neglected aspect in any effort to implement e-Learning (Bixler and Spotts, 2000). Most e-learning providers perceive themselves as mere providers of technology. In fact e-Learning cannot continue to exist without incorporation and consideration of pedagogical principles. This paper identifies the pedagogical principles underlying the teaching and learning activities that constitute effective e-Learning. These principles are then applied and illustrated by an online user-interface mediation training course. The following pedagogical attributes are discussed along five parameters: Intended Learning Outcomes (ILOs), Contents Development (LCD), Learning Progress Report (LPR), Learning Assessment Report (LAR), Learning, Learning Interaction and Student Support (LISS). The primary aim of the online mediation training course is to explore the logrolling method and strategies for achieving "win-win" settlement in mediation. On completion of the course, students shall be able to demonstrate that i) they have acquired knowledge on the key concepts of logrolling in mediation, namely reality test and preference identification; ii) they have the ability of putting the theories they learnt into practice, i.e. generating an optimal bargaining range and reach a "win-win" agreement; iii) they have acquired knowledge on the evaluation of their e-learning performance. The online learning program provides 3 teaching and learning activities (reality test, preference identification and logrolling) together with 3 learning progress reports to achieve the intended learning outcomes. Finally the logrolling-difference degree (L-DD) is used to evaluate students' learning performance by comparing their logrolling outcomes with the system's logrolling suggestions. The learning assessment report also includes the peers' L-DD results for the reflection by the participating student.

Acknowledgements

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